

High Speed Rail (West Midlands - Crewe)

Supplementary Environmental Statement 2 and
Additional Provision 2 Environmental Statement

Volume 2: Community Area report

CA4: Whitmore Heath to Madeley

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Department for Transport

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Structure of the HS2 Supplementary Environmental Statement 2 and Additional Provision 2 Environmental Statement

This report is part of the suite of documents that make up the Supplementary Environmental Statement 2 (SES2) and Additional Provision 2 Environmental Statement (AP2 ES) for Phase 2a of the High Speed Two (HS2) rail network between the West Midlands and Crewe. The SES2 and the AP2 ES are separate documents, however, they are bound together and presented in a number of volumes as described below and shown in Figure 1.

- Non-technical summary (NTS). This provides a summary in non-technical language of the SES2 (Part 1) and the AP2 ES (Part 2). It presents a summary of any likely residual significant environmental effects (i.e. effects which are likely to remain after mitigation measures are put in place), both beneficial and adverse, which are new or different to those reported in the Environmental Statement (ES) submitted to Parliament in July 2017 in support of the hybrid Bill for Phase 2a of HS2 ('the main ES'), as amended by the Supplementary Environmental Statement 1 (SES1) submitted in March 2018 (and by SES2 for the AP2 amendments). The AP1 amendments described in the AP1 ES submitted in March 2018 are also taken into account where relevant.
- Glossary of terms and list of abbreviations. This contains any new or different terms and abbreviations used throughout the SES2 and the AP2 ES which are not already explained in the main ES or SES1 and AP1 ES.
- Volume 1: Introduction to the SES2 and the AP2 ES. This introduces the supplementary environmental information and changes to the design and construction assumptions included within the SES2 and amendments within the AP2 ES. The report explains the environmental impact assessment (EIA) process that has been applied.
- Volume 2: Community area reports and map books. These report the supplementary environmental information and changes to the design and construction assumptions included within the SES2 (Part 1), amendments within the AP2 ES (Part 2) and any new or different likely significant environmental effects arising from these changes or assumptions and amendments in each community area. These effects are compared to those reported in the main ES, as amended by SES1 (and by SES2 for the AP2 amendments). The AP1 amendments are also taken into account where relevant. The maps relevant to each community area are provided in separate Volume 2 map books and should be read in conjunction with the relevant community area report.
- Volume 3: Route-wide effects. This describes any new or different likely significant environmental effects arising at a route-wide level from the

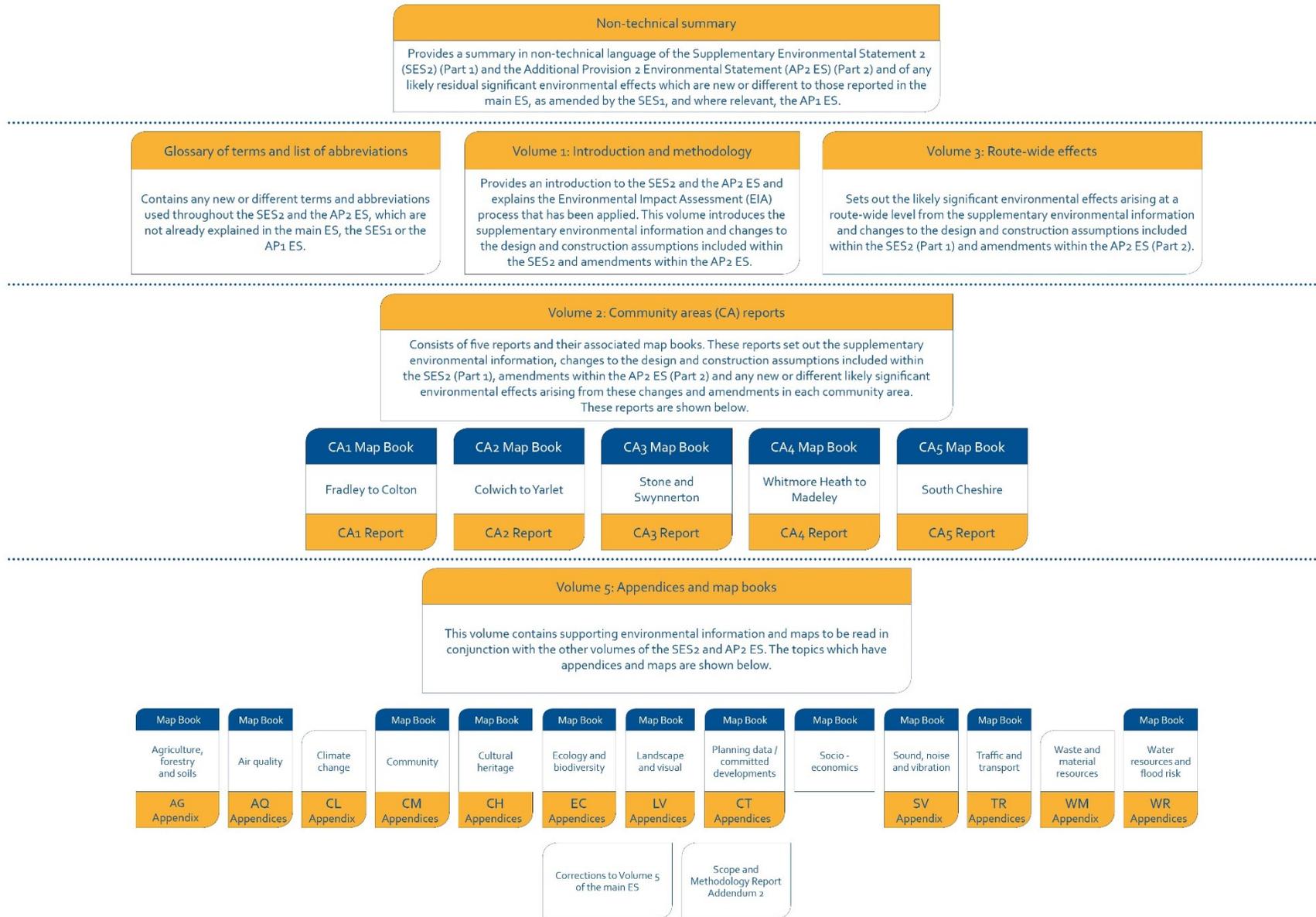
supplementary environmental information and changes to the design and construction assumptions included within the SES2 (Part 1) and the amendments within the AP2 ES (Part 2) compared to those reported in the main ES, as amended by SES1 (and by SES2 for the AP2 amendments). The AP1 amendments are also taken into account where relevant.

- Volume 5: Appendices and map book. These contain supporting environmental information and associated maps.

A Volume 4: Off-route effects report was produced as part of the main ES. This assessed the likely significant effects of the scheme at locations beyond the Phase 2a route corridor and its immediate environment. A separate Volume 4 has not been produced as part of the SES2 and AP2 ES. Any new or different significant off-route effects arising from the AP2 amendments are reported in the most relevant Volume 2 Community area report.

Certain reports and maps containing background information and data (BID) have been produced, which do not form part of the SES2 and AP2 ES. These documents are available online at www.gov.uk/hs2. The BID documents and maps present background survey information and other relevant background material.

Figure 1: Structure of the SES2 and AP2 ES



Structure of this report

This volume of the SES2 and AP2 ES is divided into five community area (CA) reports, which are in turn divided into two parts.

Part 1 provides supplementary environmental information, where relevant, relating to:

- new baseline information with respect to environmental surveys completed and additional information received since the production of the SES1 and AP1 ES;
- changes to the design and construction assumptions that do not require changes to the Bill; and
- corrections to the main ES, SES1 and the AP1 ES.

Part 2 provides environmental assessment information relating to proposed amendments to the design, which have resulted in the need to alter the powers conferred by the Bill.

Parts 1 and 2 include, where relevant:

- a description of the SES2 changes (Part 1) or the proposed AP2 amendments (Part 2) within the community area that have triggered the need for reassessment;
- an assessment of the environmental effects of the SES2 changes (Part 1) or the proposed AP2 amendments (Part 2) for relevant environmental topics considering the:
 - scope, assumptions and limitations of the assessment;
 - environmental baseline;
 - effects arising during construction;
 - effects arising from operation.
 - mitigation and residual effects; and
- a summary of any new or different likely residual significant effects as a result of the SES2 changes (Part 1) and the proposed AP2 amendments (Part 2).

1 Introduction

- 1.1.1 The High Speed Rail (West Midlands - Crewe) Bill was submitted to Parliament together with the main ES in July 2017. The SES1 and AP1 ES, which was submitted in March 2018, updated the main ES and contained a number of changes and amendments to the design of the original scheme (i.e. the scheme submitted in July 2017).
- 1.1.2 Since the submission of the main ES, SES1 and AP1 ES, updates to environmental baseline information and changes to the scheme design or assumptions have occurred, which may lead to new or different significant effects. These effects, depending on the type of change, are reported in the SES2 (Part 1) or AP2 ES (Part 2).
- 1.1.3 The Bill and associated Additional Provisions (APs) to the Bill described above, if enacted by Parliament, will provide the powers to construct, operate and maintain Phase 2a of HS2.
- 1.1.4 In order to differentiate between the original scheme and the subsequent changes, the terms set out in Table 1 are used.

Table 1: Scheme definitions

| Scheme name | Definition | Relevant CAs |
|------------------------|-----------------------------------------------------------------------------------------|--------------|
| the original scheme | the Bill scheme submitted to Parliament in July 2017, which was assessed in the main ES | 1–5 |
| the SES1 scheme | the original scheme with the changes described in the SES1 submitted in March 2018 | 1–5 |
| the AP1 revised scheme | the SES1 scheme as amended by the AP1 submitted in March 2018 | 1–3, 5 |
| the SES2 scheme | the SES1 scheme with the changes described in the SES2 | 1–5 |
| the AP2 revised scheme | the SES2 scheme as amended by the AP2 | 1–5 |

1.1.5 The following terms are used to differentiate between changes included in the SES2 and those included in the AP2 ES:

- ‘SES2 design changes’ – changes to the scheme design reported in the SES2 that do not require additional powers. In this report the term ‘design change’ is also used;
- ‘SES2 changes’ – all changes reported in the SES2 that do not require additional powers. This may include new baseline information, changes to the design and construction assumptions, and corrections; and
- ‘AP2 amendments’ – amendments to the scheme reported in the AP2 ES that include requirements for additional powers in the Bill. In this report the term ‘amendment’ is also used.

1.1.6 In addition, the following terms are also used in the SES2 and AP2 ES, where relevant:

- ‘SES1 design changes’ – changes to the scheme design reported in the SES1 that do not require additional powers;

- 'SES1 changes' – all changes reported in the SES1 that do not require additional powers. These may include new baseline information, changes to the design and construction assumptions, and corrections; and
- 'AP1 amendments' – amendments to the scheme reported in the AP1 ES that include requirements for additional powers in the Bill.

- 1.1.7 The SES2 (Part 1 of this report) contains updated environmental baseline information and scheme information relating to changes within the current limits and powers of the Bill, and therefore do not require an AP to the Bill. The SES2 changes within the Whitmore Heath to Madeley area include:
- additional environmental baseline information for air quality; cultural heritage; ecology and biodiversity and traffic and transport;
 - changes to the design and construction assumptions that do not require changes to the Bill; and
 - corrections to the main ES.
- 1.1.8 These changes are described in Part 1 and are assessed on a topic by topic basis, where relevant, using the same approach adopted in the main ES and SES1.
- 1.1.9 The purpose of SES2 is to provide an assessment of any new or different likely significant environmental effects arising from the changes described. As there were SES1 changes in the Whitmore Heath to Madeley area, the environmental effects of the SES2 changes are compared to those reported in the main ES as amended by SES1.
- 1.1.10 The AP2 ES (Part 2 of this report) describes the likely significant effects of amendments to the design of the scheme, which require the use of land outside the original limits of the Bill, additional access rights, or other extensions to the powers conferred by the Bill, making it necessary to submit an AP to the Bill.
- 1.1.11 The AP2 ES reports the assessment of each amendment separately for all relevant topics. The purpose of the AP2 ES is to provide an assessment of any new or different likely significant environmental effects arising from the amendments, compared to those reported in the main ES as amended by SES1 and SES2.
- 1.1.12 A combined assessment of new or different significant construction traffic effects, as a result of changes in construction traffic flows, is reported in Section 7. This is because alterations in construction traffic flows cannot generally be directly attributed to particular SES2 changes or AP2 amendments. Traffic and transport effects are reported first, since the effects arise from changes in construction traffic flows, and then other topics which are affected by traffic and transport changes are reported as necessary.
- 1.1.13 All other new or different significant traffic and transport effects are reported with the relevant SES2 change or AP2 amendment.
- 1.1.14 The standard measures that will be used to mitigate likely significant adverse environmental effects during construction and operation of the scheme are described in the main ES, Volume 1, Section 9 and the draft Code of Construction Practice

(CoCP)¹ submitted in support of the Bill. Implementation of these measures has been assumed in this SES2 and AP2 ES.

¹ HS2 Ltd (2017). *High Speed Rail (West Midlands - Crewe) Environmental Statement*, Volume 5: Technical appendices, draft Code of Construction Practice (CT-003-000). Available online at <https://www.gov.uk/government/publications/draft-code-of-construction-practice-for-hs2-phase-2a>

Part 1: Supplementary Environmental Statement 2

2 Summary of changes in the Whitmore Heath to Madeley area

2.1 New environmental baseline information

2.1.1 Since the production of the main ES and SES₁, updates to environmental baseline information have occurred which may lead to new or different significant effects for the following environmental topics.

Air quality

2.1.2 Air quality measurements for the baseline year of 2016 have become available in the Whitmore Heath to Madeley area. These 2016 air quality measurements have been used to verify the air quality models for the assessment of traffic emissions which is presented in Section 7. This is done by comparing predicted pollutant concentrations against air quality measurements. Details of the 2016 air quality measurements and monitoring sites that are relevant to the assessment are provided in the SES₂ and AP₂ ES Volume 5: Appendix AQ-001-004 and Map Series AQ-01.

2.1.3 Since the assessment of the original scheme, the Department for Environment, Food and Rural Affairs (Defra) has issued updated tools for undertaking air quality assessments, for example background pollutant concentrations and road vehicle emission factors. Further explanation is presented in Volume 1. The air quality assessment undertaken for the SES₂ changes and AP₂ amendments using these updated tools is reported in Section 7.

Cultural heritage

2.1.4 Additional geophysical and heritage walkover surveys have been undertaken in the Whitmore Heath to Madeley area.

2.1.5 Details of surveys completed and the additional desk based information obtained is provided in Background Information and Data (BID) document CH-004-000, which accompanies the SES₂ and AP₂ ES, and Map Series CH-01 and CH-02 in the SES₂ and AP₂ ES Volume 5: Cultural heritage Map Book.

2.1.6 Details of the supplementary cultural heritage information that is relevant to the SES₂ assessment is provided in Section 3.

Ecology and biodiversity

2.1.7 Additional Phase 1 habitat surveys have been undertaken and new ecological baseline data relating to the designation of nature conservation sites has been published by Staffordshire Wildlife Trust for the Whitmore Heath to Madeley area.

2.1.8 Details of the additional Phase 1 habitat surveys completed in the Whitmore Heath to Madeley area are provided in BID document BID-EC-019-000, which accompanies the

SES2 and AP2 ES. Details of the data relating to the designation of nature conservation sites is provided in SES2 and AP2 ES Volume 5: Appendix EC-001-000.

- 2.1.9 SES2 and AP2 ES Volume 5: Appendix EC-018-000 provides a summary of additional ecological survey data, which has resulted in no change to the conclusions of the main ES, as amended by SES1. SES2 and AP2 ES Volume 5: Appendix EC-016-000 identifies additional local/parish level effects that are likely to occur as a consequence of SES2 changes and AP2 amendments but which will not be significant.
- 2.1.10 Details of the supplementary ecological information that is relevant to the SES2 assessment are provided in Section 3.

Traffic and transport

- 2.1.11 Additional non-motorised user surveys of two footpaths have been completed in the Whitmore Heath to Madeley area.
- 2.1.12 Details of the surveys completed in the Whitmore Heath to Madeley area are provided in the BID document BID TR-001-000, which accompanies the SES2 and AP2 ES.
- 2.1.13 SES2 and AP2 ES Volume 5: Appendix TR-001-000 provides an assessment of the survey data, which has resulted in no change to the conclusions of the main ES.

2.2 Changes to the design or construction assumptions not requiring a change to the Bill

- 2.2.1 Since the production of the SES1, the need to make changes to the design and construction assumptions has been identified. The changes in the Whitmore Heath to Madeley area are as follows and are described in the following sections:
- construction programme;
 - railway systems compounds; and
 - SES2 engineering design changes.
- 2.2.2 These changes do not require a change to the Bill.

Changes to construction programme in the Whitmore Heath to Madeley area

- 2.2.3 The main ES provided indicative details of the construction works to be managed from the construction compounds in the Whitmore Heath to Madeley area, including duration of works, number of workers and a summary of the works to be undertaken.
- 2.2.4 In addition, a construction programme illustrating indicative periods for each of the core construction activities was also provided. See Volume 2, CA4, Section 2 of the main ES².

² HS2 Ltd (2017). *High Speed Rail (West Midlands - Crewe), Environmental Statement*, Volume 2, CA4, Figure 6 Indicative construction programme between 2020 and 2027. Available online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/627567/E16_CA4_Whitmore_Heath_to_Madeley_WEB.pdf

- 2.2.5 Since submission of the SES1, changes to the design and construction assumptions, including a route-wide review of the earthworks and movement of materials, have resulted in the need to make alterations to the indicative construction programme, shown in Figure 2 and reported in Section 3 of the SES2 and Section 5 of the AP2 ES.
- 2.2.6 The main AP2 amendments which give rise to changes to the construction programme are listed below and identified in Figure 2, which provides a revised indicative construction programme³. AP2 amendments which give rise to changes to the construction programme are included in this section for completeness, but the assessment of those amendments is reported in Section 5 of the AP2 ES.
- 2.2.7 The SES2 design changes in the Whitmore Heath to Madeley area do not give rise to changes to the construction programme.
- 2.2.8 The following AP2 amendments give rise to changes to the construction programme:
- Additional land required for provision of a power supply to Whitmore Heath tunnel (AP2-004-001);
 - Additional land required and changes to Bill powers for changes to the vertical and horizontal alignment between Hatton South cutting and Madeley Bridleway 1 accommodation green overbridge (AP2-004-002);
 - Additional land required and a change to Bill powers for modifications to the A51 Stone Road/Nantwich Road/A53 Newcastle Road junction (AP2-004-003); and
 - Additional land required for provision of a power supply to Madeley tunnel (AP2-004-007).
- 2.2.9 The AP2 amendments above are considered to require a reassessment of the likely significant environmental effects and any mitigation and these are reported in Section 5 or Section 7, where relevant.
- 2.2.10 Other AP2 amendments give rise to changes to the construction programme, but are not of a scale to be shown in Figure 2. These AP2 amendments are also reported in Section 5 and the construction programme is as described in the relevant scheme descriptions.

³ Site reinstatement shown in the construction programme is phased; phase one includes reinstatement of civils construction compounds and following completion of civils construction activities. The second phase includes reinstatement of haul roads, which remain until completion of track installation construction activities.

Railway systems compounds

- 2.2.11 The Bill provides for land to be acquired for a number of railway systems compounds from which railway installation works will be managed. These works include: installation of the hydraulically bound layer⁴ and pre-cast slab, rails (including crossovers) and overhead line equipment, installation of auto-transformer stations and changes to the existing rail network.
- 2.2.12 Since the submission of the main ES, refinement of the construction methodology and access requirements for the installation of slab track⁵ has led to changes in the operational characteristics of three railway systems compounds in the Whitmore Heath to Madeley area. These include:
- change to the operational period (duration and start/end date);
 - change in the number of railway system workers (peak and/or average); and
 - change in railway systems construction traffic numbers (heavy goods vehicles (HGV) and cars/light goods vehicles (LGV)).
- 2.2.13 To further support this refinement in construction methodology and wherever practicable, site haul routes have been retained on completion of the civil engineering phase to support the access to railway systems compounds for slab track installation from the main road network and to reduce the reliance on access from the local road network.
- 2.2.14 The change to the operational characteristics of the existing compounds in this area does not require a change to the Bill and is not considered to require in isolation a reassessment of the environmental effects or mitigation as set out in the main ES with respect to any environmental topics.
- 2.2.15 Whilst the changes to the construction methodology and access requirements for the installation of a slab track formation will increase the number of railway systems HGV movements, these will be later in the construction programme than civil engineering HGV movements and will, wherever practicable, utilise access via site haul routes from the main road network. In these locations, any increase in traffic on the road network associated with slab track installation will be relatively small. There will therefore be no new or different significant traffic effects as a result of these changes in isolation, compared to those reported in the main ES. This change, in combination with other SES2 changes and AP2 amendments, is reported for traffic, and other topics, which are affected by changes to traffic flows in Section 7.
- 2.2.16 Table 2 provides details on the changes to the operational characteristics of the existing railway systems compounds in this area.

⁴ Aggregate mixture incorporating cement or lime based or other binders, which harden in-situ by a chemical/hydraulic reaction.

⁵ HS2 Ltd (2017). *High Speed Rail (West Midlands - Crewe), Environmental Supplementary Environmental Statement and Additional Provision Environmental Statement* (March 2018), Volume 1, Section 7. Available online at:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/692614/G7_Volume_1_WEB.pdf

SES2 and AP2 ES Volume 2 – Community area 4, Whitmore Heath to Madeley

Table 2: Summary of changes to the construction assumptions within the existing powers of the Bill in the Whitmore to Madeley Heath area

| Details of changes to construction assumptions | Description of the SES1 scheme | Description of the SES2 scheme | Change to significant effects |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Change to the operational duration ⁶ , railway systems worker numbers and railway systems HGV trips for the Whitmore Heath tunnel south portal satellite compound | <p>The main ES reported that this compound would be operational for one year, commencing during 2025.</p> <p>The main ES further reported that the compound would support an average of 10 railway systems workers per day (15 workers at peak times).</p> <p>The main ES further reported that the compound would generate up to 10 railway systems HGV trips per day during busy periods⁷ and within the peak month of activity.</p> <p>Map CT-05-230, I6, in the main ES, Volume 2, CA4 Map Book</p> | <p>The railway installation works will be undertaken for a period of nine months, commencing during 2025.</p> <p>There will be an increase in the number of railway systems workers supported by this compound with an average of 30 railway systems workers per day (50 workers at peak times).</p> <p>There will be an increase in the number of railway systems HGV trips generated by this compound with 110-152 trips per day during the busy periods and within the peak month of activity.</p> | <p>The increase in duration of the compound to support railway systems works is small in comparison to the overall duration of the compound. Therefore, the level of significance reported in the main ES with regard to increase in duration of the compound will not change.</p> <p>Although there will be an increase in peak HGV and worker trips to this compound as a result of the change, this will not lead to any new or different significant effects in isolation, as the change to overall traffic levels on the road network is relatively small.</p> <p>The assessment of the changes in railway systems HGV and worker trips is considered in combination with other SES2 changes and AP2 amendments and reported in Section 7.</p> |
| Change to the operational duration, railway systems worker numbers and railway systems HGV trips for the Madeley tunnel (south) satellite compound | <p>The main ES reported that this compound would be operational for a total of five years, commencing during 2020. Civil engineering works would be managed from this compound for a period of four years and three months, followed by railway installation works for a period of nine months.</p> <p>The main ES further reported that the compound would support an average of 45 civil engineering workers per day (150 workers at peak times) and an average of 10 railway systems workers per day (15 workers at peak times).</p> <p>The main ES further reported that the compound would generate 64-81 civil engineering HGV trips per day and up to 10 railway systems HGV trips per</p> | <p>There are no changes to the operational characteristics for the Madeley tunnel (south) satellite compound related to civil engineering works.</p> <p>The railway installation works will be undertaken for a period of six months, commencing during 2025. The compound will be operational for a total of five years and three months, an increase in three months from that stated in the main ES.</p> <p>There will be an increase in the number of railway systems workers supported by this compound with an average of 20 railway systems workers per day (30 workers at peak times).</p> | <p>The increase in duration of the compound to support railway systems works is small in comparison to the overall duration of the compound (civil engineering and railway systems works). Therefore, the level of significance reported in the main ES with regard to increase in duration of the compound will not change.</p> <p>Although there will be an increase in peak worker trips to this compound as a result of the change, this will not lead to any new or different significant effects in isolation, as the change to overall traffic levels on the road network is relatively small.</p> |

⁶ The Volume 2 scheme description of the construction phase represents the duration of works in a different way to the Volume 5 Transport Assessment addendum (SES2 and AP2 ES Volume 5: Appendix TR-001-000). The Volume 2 scheme description is based on quarters (each representing three months), e.g. December (Quarter 4) to February (Quarter 1) is rounded to six months, whereas the Volume 5 Transport Assessment addendum counts the absolute duration e.g. three months.

⁷ The busy period is the period during which HGV traffic serving that compound will be greater than 50% of the HGV traffic in the peak month. The average daily combined two-way vehicle trips for the busy period is the lower end of the range and for the peak month is the upper end of the range.

SES2 and AP2 ES Volume 2 – Community area 4, Whitmore Heath to Madeley

| Details of changes to construction assumptions | Description of the SES1 scheme | Description of the SES2 scheme | Change to significant effects |
|-----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | day during busy periods and within the peak month of activity. Map CT-05-233, F5 to D4, in the main ES, Volume 2, CA4 Map Book | There will be an increase in the number of railway systems HGV trips generated by this compound with 79-81 trips per day during the busy periods and within the peak month of activity. | The assessment of the changes in railway systems HGV and worker trips is considered in combination with other SES2 changes and AP2 amendments and reported in Section 7. |
| Change to the railway systems worker numbers and railway systems HGV trips for the Madeley tunnel north portal satellite compound | The main ES reported that the compound would support an average of 45 railway systems workers per day (85 workers at peak times). The main ES further reported that the compound would generate 18-26 railway systems HGV trips per day during busy periods and within the peak month of activity. Map CT-05-234, H5, in the main ES, Volume 2, CA4 Map Book | There will be a decrease in the number of railway systems workers supported by this compound with an average of 30 railway systems workers per day (65 workers at peak times). There will be an increase in the number of railway systems HGV trips generated by this compound with 90-98 trips per day during the busy periods and within the peak month of activity. | Although there will be an increase in peak HGV trips to this compound as a result of the change, this will not lead to any new or different significant effects in isolation, as the change to overall traffic levels on the road network is relatively small. The assessment of the changes in railway systems HGV and worker trips is considered in combination with other SES2 changes and AP2 amendments and reported in Section 7 |

SES2 engineering design changes

2.2.17 Table 3 provides a summary of the SES2 engineering design changes not requiring a change to the Bill, which result in new or different significant effects in the Whitmore Heath to Madeley area. Figure 3 shows the locations of these changes.

2.2.18 All dimensions in the following sections are approximate.

Table 3: Summary of changes to the engineering design not requiring a change to the Bill in the Whitmore Heath to Madeley area

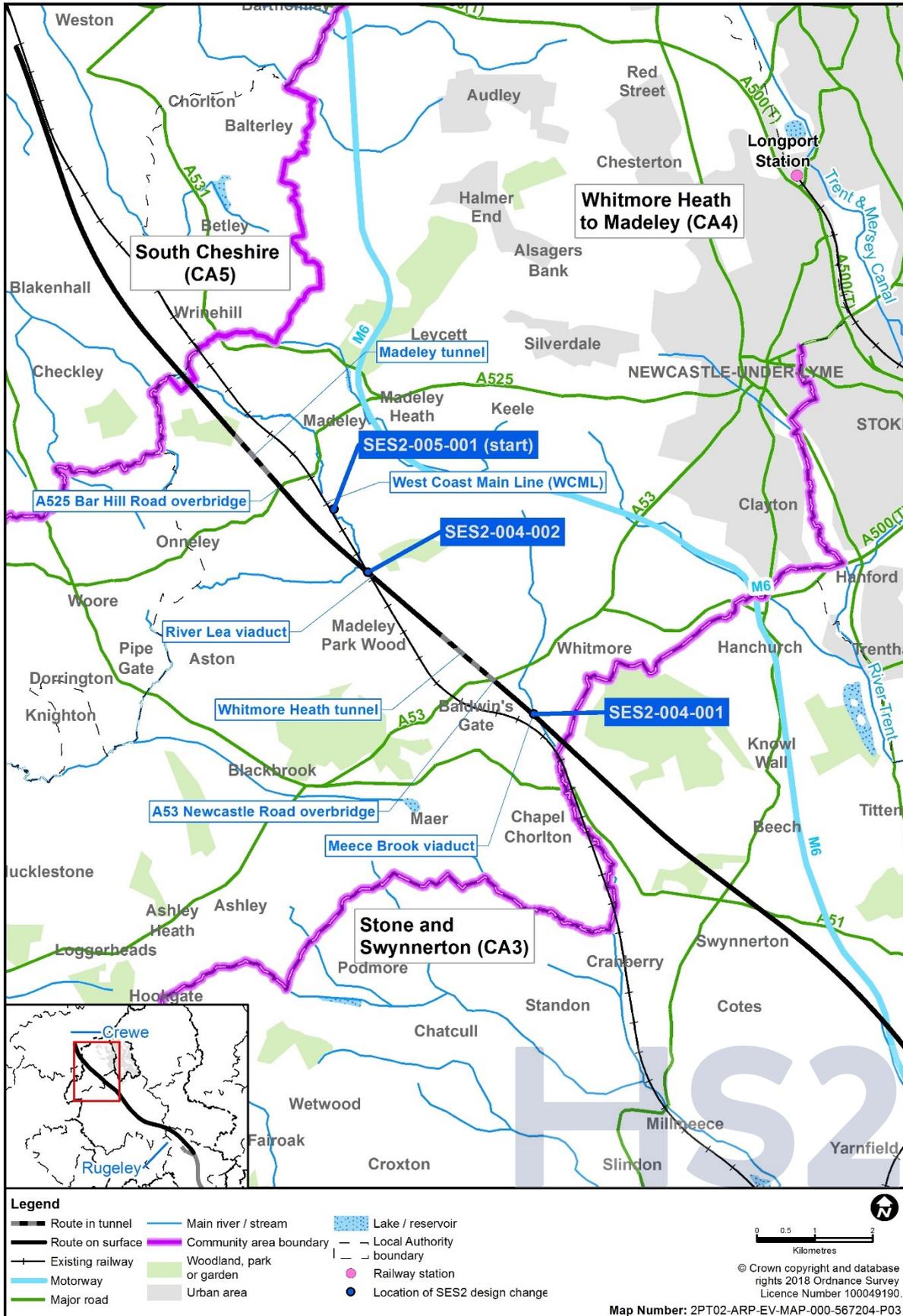
| Name of SES2 engineering design change | Description of the SES1 scheme | Description of the SES2 scheme |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Local placement of surplus excavated material to the north of Whitmore South cutting SES2-004-001 Map CT-06-229, D5 to B2 and Map CT-05. D5 to B2 in the SES2 and AP2 ES Volume 2, CA4 Map Book, | Two temporary material stockpiles and the A53 Newcastle Road transfer node would be located on the northern side of Whitmore South cutting, to the southern side of the A53 Newcastle Road, which would be realigned to cross the HS2 route via the A53 Newcastle Road overbridge. Following construction, the land would be returned to agricultural use. | Surplus excavated material will be placed permanently on the northern side of Whitmore South cutting, to the southern side of the A53 Newcastle Road on land proposed in the original scheme for the two temporary material stockpiles and the A53 Newcastle Road transfer node. The material will be graded so that the land can be returned to agricultural use. This SES2 design change is dependent on the AP2 revised scheme (AP2-004-002) being enacted, as the northern part of the local placement area makes use of land that was included in the original scheme for the realignment of the A53 Newcastle Road and a balancing pond for highway drainage, which will be removed as a result of the amendment. |

SES2 and AP2 ES Volume 2 – Community area 4, Whitmore Heath to Madeley

| Name of SES2 engineering design change | Description of the SES1 scheme | Description of the SES2 scheme |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Increase in average mineral excavation depth for the borrow pit west of Netherset Hey Farm</p> <p>SES2-004-002</p> <p>Map CT-05-232, H5 to D1 and Map CT-05-232-R1, H10 to C9 in the SES2 and AP2 ES Volume 2, CA4 Map Book</p> | <p>A borrow pit, west of Netherset Hey Farm, would be provided for the extraction of sand and gravel for construction of the scheme. The borrow pit would be excavated to an assumed average depth of 4.5m, comprising 1m of topsoil and subsoil and 3.5m of sand and gravel extraction, and up to a maximum extraction depth of 17m. Based on the assumed average depth, the borrow pit would be excavated across an area of up to 28ha. Topsoils and subsoils would be stored and used in restoration of the borrow pit.</p> | <p>For the purpose of assessment, the average excavation depth at the borrow pit, west of Netherset Hey Farm, will be increased from 4.5m to 8m, comprising 1.2m of topsoil and subsoil and an average mineral extraction depth of 6.8m of sand and gravel for construction. The maximum extraction depth will remain at up to 17m.</p> <p>The additional material will be required to reduce the amount of sand and gravel imported for construction.</p> |
| <p>Reconfiguration of the existing West Coast Main Line tracks between Madeley Bridleway 2 and A500 Shavington Bypass and provision of a new railway systems compound</p> <p>SES2-005-001</p> <p>Map CT-05-232, E4 to F4 in the SES2 and AP2 ES Volume 2, CA4 Map Book and CT-05-236, J2 to J3, to CT-05-239, C5 to C6, in the SES2 and AP2 ES Volume 2, CA5 Map Book.</p> | <p>Railway systems modifications would be required to the existing conventional rail infrastructure in the South Cheshire area (CA5) and Whitmore Heath to Madeley area to connect the HS2 spurs to the West Coast Main Line (WCML).</p> <p>A new section of the WCML, 4.2km in length, would be located to the west of the existing WCML between Blakenhall Bridleway 8 accommodation overbridge and Crewe South portal retained cutting.</p> | <p>The connection between the HS2 spurs and the WCML will be modified to connect the HS2 main line into the central lines of the WCML. There will be associated railway systems modifications between the Madeley Bridleway 2 in the south and the A500 Shavington Bypass in the north. The modifications will take place in the Whitmore Heath to Madeley area and in the South Cheshire area (CA5).</p> <p>In the Whitmore Heath to Madeley area, railway systems modifications, such as signalling, overhead lines, cable routes and other railway systems equipment, will be required within the existing WCML corridor north from Madeley Bridleway 2. Relocation of a railway systems signalling asset (a relocatable equipment building) on the western side of the WCML, near the River Lea viaduct, will no longer be required and removes the need for the associated maintenance access road off Manor Road to the east of the HS2 route and Hey House.</p> |

SES2 and AP2 ES Volume 2 – Community area 4, Whitmore Heath to Madeley

Figure 3: Locations of SES2 engineering design changes not requiring a change to the Bill in the Whitmore Heath to Madeley area



Local placement of surplus excavated material to the north of Whitmore South cutting (SES2-004-001)

- 2.2.19 The Bill provides for the temporary storage of excavated material, adjacent to the HS2 route, for reuse within the scheme during construction. Two temporary material stockpiles and the A53 Newcastle Road transfer node would be provided to the northern side of the Whitmore South cutting, to the south of the A53 Newcastle Road, which would be realigned to cross over the HS2 route via the A53 Newcastle Road overbridge. Following construction, the land would be returned to agricultural use. See Map CT-05-229, D5 to B5, in the main ES Volume 2, CA4 Map Book.
- 2.2.20 As part of a route-wide review of earthworks and the movement of materials, the scope for local placement of surplus excavated material on land already required for the construction of the scheme has been considered. Use of local placement areas would reduce the need for off-site road transportation and disposal of surplus excavated material and reduce the environmental impacts arising from heavy goods vehicle (HGV) movements on the highway network. Volume 1 of the SES2 and AP2 ES provides further detail on the local placement of surplus excavated material.
- 2.2.21 Surplus excavated material will be placed permanently to the north of Whitmore South cutting, in an area occupied by the two temporary material stockpiles and the A53 Newcastle Road transfer node in the original scheme. The location for the placement of surplus excavated material will cover an area of 8.5ha and be up to 3m in height. The surplus excavated material will be graded to allow the area to be returned to agricultural use following construction. See Map CT-06-229, D5 to B5, in the SES2 and AP2 ES Volume 2, CA4 Map Book.
- 2.2.22 At its southern end, the local placement area overlaps with an area of woodland habitat creation and an area of landscape mitigation planting proposed in the original scheme. These areas of planting will be provided on top of the local placement area. An ecological mitigation pond will be relocated approximately 100m to the south, to accommodate the toe of the earthwork. A perimeter drainage ditch will be provided along the northern side of the area, adjacent to the A53 Newcastle Road, draining to the Meece Brook. See Map CT-06-229, C3 to A6, in the SES2 and AP2 ES Volume 2, CA4 Map Book.
- 2.2.23 The agricultural soil profile (i.e. the topsoil and subsoil) will be available for agricultural restoration so that agricultural soils can be returned to the same condition as their pre-excavated state, using good practice techniques to handle, store and reinstate soils. Given the currently unknown nature of the surplus excavated material beneath the restored agricultural soil profile, it is likely that agricultural land drainage works will be required when restoring this area to achieve this condition and to ensure ongoing agricultural management of the restored land.
- 2.2.24 Surplus excavated material will be placed in the local placement area throughout the construction period as suitable material arises. Works will be managed from the Whitmore Heath tunnel south portal satellite compound.
- 2.2.25 This SES2 design change is dependent on the AP2 revised scheme (AP2-004-002) being enacted, as the northern part of the permanent earthwork area makes use of land that was included in the original scheme for the realignment of the A53 Newcastle Road and a balancing pond for highway drainage, which will be removed as

a result of the amendment. This SES2 design change will have a reduced area if not introduced in conjunction with the AP2 revised scheme (AP2-004-002).

Local alternatives

- 2.2.26 A process of identifying potentially suitable local placement areas in the Whitmore Heath area was undertaken.
- 2.2.27 This process identified three locations in the Whitmore Heath area for the placement of surplus excavated material. These were considered against criteria, as identified in Volume 1, which set out the key considerations for the suitability of local placement sites.
- 2.2.28 When considered against the criteria, the following two options were not taken forward for further consideration as they were not considered to be reasonable options:
- Option 3A would be located to the south of A53 Newcastle Road, on the southern side of Whitmore South cutting. This option was not taken forward as it would require additional land outside of the Bill and would conflict with the diversion of a high pressure fuel pipeline; and
 - Option 3B would be located to the south of A53 Newcastle Road, on the northern side of Whitmore South cutting. This option was not taken forward as it would require additional land outside of the Bill.
- 2.2.29 Option 3C would be located to the south of A53 Newcastle Road, on the northern side of Whitmore South cutting. The location for this option meets the majority of the criteria, however it is in proximity to Whitmore Cricket Club, which would potentially be subject to moderate visual impacts. In addition, this option would be over a principal aquifer, potentially resulting in moderate impacts on groundwater. This option has been taken forward into the SES2 scheme as, on balance, the effects on Whitmore Cricket Club and groundwater would be limited to the construction period.

Topics included in the SES2 assessment

- 2.2.30 The assessment of the changes to construction traffic flows and traffic related effects as a result of this SES2 design change in combination with all SES2 changes and AP2 amendments, is reported in Section 7.
- 2.2.31 This SES2 design change is not considered to require a reassessment of the environmental effects or mitigation as set out in the main ES, as amended by SES1 and SES2, with respect to any environmental topics.

Increase in average mineral excavation depth for the borrow pit west of Netherset Hey Farm (SES2-004-002)

- 2.2.32 The Bill provides for a borrow pit, west of Netherset Hey Farm, for the extraction of sand and gravel for construction, accessed initially during site set up from Netherset Hey Lane and the A525 Bar Hill Road, with the main access then via site haul routes along the HS2 route. The borrow pit would be excavated to an assumed average depth of 4.5m, comprising 1m of topsoil and subsoil and 3.5m of sand and gravel extraction, and up to a maximum extraction depth of 17m, derived from geotechnical

desk study of mineral resources. Based on the assumed average depth, the borrow pit would be excavated across an area of up to 28ha. Topsoils and subsoils would be stored and used in restoration of the borrow pit. See Volume 2: Map CT-05-232, H5 to D1, and Map CT-05-232-R1, H10 to C9, in the main ES Volume 2, CA4 Map Book.

- 2.2.33 Since submission of the Bill, a review of new historic borehole data indicates that the average depth of the mineral excavation at the borrow pit, west of Netherset Hey Farm, can be increased, to reduce the amount of sand and gravel imported from off-site for construction.
- 2.2.34 The average excavation depth at the borrow pit, west of Netherset Hey Farm, will be increased from 4.5m to 8m, comprising 1.2m of topsoil and subsoil and 6.8m of sand and gravel⁸. See Map CT-05-232, H5 to D1, and Map CT-05-232-R1, H10 to C9, in the SES2 and AP2 ES Volume 2, CA4 Map Book. The maximum extraction depth will remain at up to 17m. Topsoils and subsoils would be stored and used in restoration of the borrow pit and the land will be re-graded to ensure suitability for agricultural use following construction.
- 2.2.35 This SES2 design change will be constructed over a period of four years, commencing in 2021. Works will be managed from the River Lea viaduct satellite compound.

Topics included in the SES2 assessment

- 2.2.36 The assessment of the changes to construction traffic flows and traffic related effects as a result of this SES2 design change in combination with all SES2 changes and AP2 amendments, is reported in Section 7.
- 2.2.37 This SES2 design change is not considered to require a reassessment of the environmental effects or mitigation as set out in the main ES, as amended by SES1 and SES2, with respect to any environmental topics.

Reconfiguration of the existing West Coast Main Line tracks between Madeley Bridleway 2 and A500 Shavington Bypass and provision of a new railway systems compound (SES2-005-001)

- 2.2.38 Part of this SES design change lies within the Whitmore Heath to Madeley area. A detailed description of the amendment and assessment of effects within the Whitmore Heath to Madeley area is reported below. Part of this SES design change lies within the South Cheshire area (CA5) and the works associated with this amendment and assessment of effects on receptors within the South Cheshire area are described in SES2 and AP2 ES Volume 2, Community area 5, South Cheshire.
- 2.2.39 The Bill provides for the modification of the WCML to accommodate the connection of the two HS2 spur tracks in the Whitmore Heath to Madeley and the South Cheshire areas. See Map CT-06-236-R1, F10, to CT-06-241, H5, in the main ES Volume 2, CA5 Map Book.
- 2.2.40 Railway systems alterations and track modifications would be required within the existing WCML corridor from the River Lea viaduct in the Whitmore Heath to Madeley area and Crewe Station in the South Cheshire area. See Map CT-06-232, F4, in the

⁸ The change in the topsoil and subsoil depth from that reported in the main ES is to allow a full agricultural soil profile to be restored.

main ES Volume 2, CA4 Map Book to CT-06-241, H5, in the main ES Volume 2, CA5 Map Book.

2.2.41 Since submission of the Bill, further design refinement and consideration of operational requirements have identified a need to modify the connection between the two HS2 spurs and the WCML. As a result, the following amendments to the original scheme will be required in the Whitmore Heath to Madeley area:

- railway systems modifications, such as signalling, overhead lines, cable routes and other railway systems equipment, will be required within the existing WCML corridor from Madeley Bridleway 2 to south of the A500 Shavington Bypass. See Map CT-05-234, C2 in the SES2 and AP2 ES Volume 2, CA4 Map Book to Map CT-05-239, C5 in the SES2 and AP2 ES Volume 2, CA5 Map Book; and
- relocation of a railway systems signalling asset (a relocatable equipment building) on the western side of the WCML, near the River Lea viaduct, will no longer be required and removes the need for the associated maintenance access road off Manor Road to the east of the HS2 route and Hey House. See Map CT-06-232, F4, in the SES2 and AP2 ES Volume 2, CA4 Map Book.

2.2.42 Construction of all modifications will be managed from the Blakenhall cutting satellite compound, Chorlton cutting satellite compound, Crewe South portal satellite compound and Basford cutting main compound in the South Cheshire area (CA5). The SES2 design change in the Whitmore Heath to Madeley area will be constructed over a period of six years, commencing in 2021.

Topics included in the SES2 assessment

2.2.43 The assessment of the changes to construction traffic flows and traffic related effects as a result of this SES2 design change in combination with all SES2 changes and AP2 amendments, is reported in Section 7.

2.2.44 This SES2 design change is not considered to require a reassessment of the environmental effects or mitigation as set out in the main ES, as amended by SES1 and SES2, with respect to any environmental topics.

2.3 Corrections to the main ES

2.3.1 Since submission of the main ES, the need for a number of corrections to the contents of the main ES has been identified. Table 4 clarifies elements of the scheme description reported in the main ES. The table gives the location of the text that is subject to the correction in the main ES, the reason for the correction, replicates the text from the main ES, where applicable provides revised text, and identifies whether the correction changes a significant effect reported in the main ES. Where relevant, these corrections have been taken into account in the technical assessments contained within Section 3 of this SES2.

Table 4: Summary of corrections to the main ES in the Whitmore Heath to Madeley area

| Reference in the main ES | Reason for correction | Text in the main ES | Revised text | Change to significant effects and mitigation |
|----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Overview of the area and description of the Proposed Scheme Paragraph 2.3.59, Volume 2, CA4 of the main ES | The number of railway system workers supported by the Whitmore Heath tunnel south portal satellite compound was reported as 15 workers per day at peak times in the scheme description. This should have been reported as 10 workers at peak times. | Paragraph 2.3.59, second bullet ...support 10 railway installation workers per day (15 workers at peak times); and | Paragraph 2.3.59, second bullet ...support 10 railway installation workers per day (10 workers at peak times); and | There is no change to the significant effects reported in the main ES. The assessment was based on the correct number of workers. |
| Overview of the area and description of the Proposed Scheme Paragraph 2.3.107, Volume 2, CA4 of the main ES | The number of railway system workers supported by the Madeley tunnel (south) satellite compound was reported as 15 workers per day at peak times in the scheme description. This should have been reported as 10 workers at peak times. | Paragraph 2.3.107, third bullet: ...support 10 railway installation workers per day (15 workers at peak times); | Paragraph 2.3.107, third bullet: ...support 10 railway installation workers per day (10 workers at peak times); | There is no change to the significant effects reported in the main ES. The assessment was based on the correct number of workers. |
| Ecology and biodiversity Paragraph 8.4.9, Volume 2, CA4 of the main ES | The area of Hey Sprink (wood south-west of) Local Wildlife Site (LWS) lost to the original scheme was reported in main ES as 0.2ha. This should have been reported as 300m ² . The area of Hey Sprink (wood south-west of) ancient woodland lost to the original scheme was correctly reported in the main ES as 0.2ha. The boundary of the ancient woodland and the LWS are not the same. | Paragraph 8.4.9: Construction of Lea South embankment will result in the permanent loss of approximately 0.2ha (6%) of ancient woodland from Hey Sprink (wood south-west of) LWS. The loss of ancient woodland will have a permanent adverse effect on this habitat that is significant at county level. | Paragraph 8.4.9: Construction of Lea South embankment will result in the permanent loss of approximately 0.2ha (6%) of ancient woodland from woodland at Hey Sprink (wood south-west of). <i>Approximately 300m² of the ancient woodland to be lost is within Hey Sprink (wood south-west of) LWS.</i> The loss of ancient woodland will have a permanent adverse effect on this habitat that is significant at county level. | There is no change to the significant effects reported in the main ES. The assessment was based on the loss of 0.2ha of ancient woodland, which was reported as a permanent adverse effect, significant at county level. |

3 Assessment of SES2 changes in the Whitmore Heath to Madeley area

3.1 Introduction

- 3.1.1 Section 3 reports the assessment for cultural heritage and ecology and biodiversity as a result of the SES2 changes.

3.2 Cultural heritage

Introduction

- 3.2.1 The environmental baseline relevant to the cultural heritage assessment is described below. Any new or different likely significant environmental effects as a result of the changes introduced in Section 2 are then identified, compared to those reported in the main ES, as amended by SES1.

Scope, assumptions and limitations

- 3.2.2 The assessment scope, key assumptions and limitations for cultural heritage are as set out in Volume 1 of the Scope and Methodology Report (SMR)⁹ and SMR Addendum¹⁰ of the main ES and SMR Addendum 2 (see SES2 and AP2 ES Volume 5: Appendix CT-001-000).
- 3.2.3 As the cultural heritage impacts of the SES2 changes of relevance to this assessment are not reversible, they therefore have the potential to result in new or different significant permanent construction effects only. There is no temporary construction or operational assessment for cultural heritage.

SES2 changes of relevance to this assessment

- 3.2.4 New heritage baseline information identified through geophysical surveys in the Whitmore Heath to Madeley area is considered in this assessment.

Environmental baseline

Existing baseline

- 3.2.5 The baseline cultural heritage information for the Whitmore Heath to Madeley area is as described in Volume 2, CA4, Section 7 of the main ES.
- 3.2.6 Additional geophysical surveys undertaken in the Whitmore Heath to Madeley area have identified potential prehistoric activity, including a possible Bronze Age burial mound, a non-designated asset of low value, to the west of Madeley (WHM109).

⁹ HS2 Ltd (2017). *High Speed Rail (West Midlands - Crewe) Environmental Statement*, Volume 5: Technical appendices, Environmental Impact Assessment Scope and Methodology Report (Appendix CT-001-001). Available online at: <https://www.gov.uk/government/publications/scope-and-methodology-report-for-hs2-phase-2a>

¹⁰ HS2 Ltd (2017). *High Speed Rail (West Midlands - Crewe) Environmental Statement*, Volume 5: Technical appendices, Environmental Impact Assessment Scope and Methodology Report Addendum (Appendix CT-001-002). Available online at: <https://www.gov.uk/government/publications/scope-and-methodology-report-for-hs2-phase-2a>

3.2.7 Further information about this asset is provided in the main ES Volume 5: Appendix CH-002-004 and Map Series CH-01, CH-02 and CH-03 in the main ES Volume 5: Cultural heritage Map Book, and Background Information and Data (BID) document CH-004-004, which accompanies the main ES.

3.2.8 Details of surveys completed and the additional desk based information obtained is provided in SES2 and AP2 ES Volume 5: Appendix CH-002-000, the SES2 and AP2 ES Volume 5: Cultural heritage Map Book, and BID CH-004-000, which accompanies the SES2 and AP2 ES, and Map Series CH-01 and CH-02 in the SES2 and AP2 ES Volume 5: Cultural heritage Map Book.

Future baseline

Construction (2020)

3.2.9 The future baseline for construction in 2020 remains unchanged from that reported in the main ES Volume 5: Appendix CT-004-000.

Effects arising during construction

Avoidance and mitigation measures

3.2.10 No avoidance or mitigation measures, additional to those reported in the main ES and draft Code of Construction Practice (CoCP)¹¹, are identified.

Assessment of impacts and effects

3.2.11 A possible Bronze Age burial mound (WHM109), a non-designated asset of low value, identified through additional geophysical surveys will be completely removed by the construction of the original scheme. This will give rise to a new permanent high adverse impact and a new permanent moderate adverse effect, which is significant.

3.2.12 For further information see the SES2 and AP2 ES Volume 5: Appendix CH-003-000.

Mitigation and residual effects

Other mitigation measures

3.2.13 No mitigation measures additional to those reported in the main ES and draft CoCP are identified.

Summary of likely residual significant effects

3.2.14 Additional geophysical surveys have identified a possible Bronze Age burial mound (WMH109) which will be completely removed by the construction of the original scheme. This will give rise to a new likely residual significant permanent moderate adverse effect.

¹¹ HS2 Ltd (2017). *High Speed Rail (West Midlands - Crewe) Environmental Statement*, Volume 5: Technical appendices, draft Code of Construction Practice (CT-003-000). Available online at <https://www.gov.uk/government/publications/draft-code-of-construction-practice-for-hs2-phase-2a>

Cumulative effects

- 3.2.15 There are no new or different likely significant cumulative effects for cultural heritage as a result of the SES2 changes relevant to this assessment acting in combination with any other SES2 changes.

3.3 Ecology and biodiversity

Introduction

- 3.3.1 The environmental baseline relevant to the ecology and biodiversity assessment is described below. Any new or different likely significant environmental effects as a result of the changes introduced in Section 2 are then identified, compared to those reported in the main ES, as amended by SES1.

Scope, assumptions and limitations

- 3.3.2 The assessment scope, key assumptions and limitations for ecology and biodiversity are as set out in Volume 1, the Scope and Methodology Report (SMR)¹² and SMR Addendum¹³ of the main ES and SMR Addendum 2 (see SES2 and AP2 ES Volume 5: Appendix CT-001-000).
- 3.3.3 The SES2 changes of relevance to this assessment have the potential to result in new or different significant construction effects only. Therefore, there is no operational assessment for ecology and biodiversity.
- 3.3.4 Where data are limited, a precautionary baseline has been built up according to the guidance provided in the SMR and SMR Addendum. This constitutes a 'reasonable worst case' basis for the subsequent assessment.
- 3.3.5 The precautionary approach to the assessment that has been adopted identifies the likely significant environmental effects of the SES2 scheme.

SES2 changes of relevance to this assessment

- 3.3.6 The SES2 change considered in this assessment comprises new baseline information on designated nature conservation sites.

Environmental baseline

Existing baseline

- 3.3.7 The ecological baseline for the assessment takes into account baseline information collected in support of the main ES and SES1, which included field survey data, aerial photography and relevant existing information gathered from national organisations and from regional and local sources. A full list of data sources that informed the assessment in this area is provided in Volume 2, CA4, Section 8 of the main ES.

¹² HS2 Ltd (2017). *High Speed Rail (West Midlands - Crewe) Environmental Statement*, Volume 5: Technical appendices, Environmental Impact Assessment Scope and Methodology Report (Appendix CT-001-001). Available online at: <https://www.gov.uk/government/publications/scope-and-methodology-report-for-hs2-phase-2a>

¹³ HS2 Ltd (2017). *High Speed Rail (West Midlands - Crewe) Environmental Statement*, Volume 5: Technical appendices, Environmental Impact Assessment Scope and Methodology Report Addendum (Appendix CT-001-002). Available online at: <https://www.gov.uk/government/publications/scope-and-methodology-report-for-hs2-phase-2a>

The assessment also takes into account additional desk study and survey information that is reported in Background Information and Data (BID) document EC-004-000, including Map Series (EC-02, EC-04, EC-05, EC-10, EC-11 and EC-12¹⁴), which accompanies SES1.

- 3.3.8 Details of the designated nature conservation sites are provided in SES2 and AP2 ES Volume 5: Appendix EC-001-000, including Map Series EC-01.

Designated sites

- 3.3.9 Since the production of SES1, the extent of the area designated as Hey Sprink (wood south-west of) Local Wildlife Site (LWS) has been increased from approximately 2.7ha to approximately 3ha. This site is within an area listed as an Ancient Woodland Inventory (AWI) site that extends to approximately 3.2ha as reported in the main ES. The LWS and AWI were reported in the main ES and valued at county level. The LWS comprises a narrow ravine colonised by broadleaved woodland with a mixed range of ancient woodland indicator species. Hey Sprink (wood south-west of) LWS is located south-east of the West Coast Main Line (WCML), partially within the land required for the original scheme. The LWS remains of county value.
- 3.3.10 Since the production of SES1, the unnamed woodland south of Hey Sprink has been designated as a LWS (Hey Sprink (south) LWS). This site is also designated as an AWI site and reported in the main ES. The LWS covers an area of approximately 0.9ha and comprises ancient woodland including species such as oak, alder, goat willow and holly. Hey Sprink (south) LWS is located to the north of Whitmore Heath and east of the WCML, partially within the land required for the original scheme. The LWS is of county value.
- 3.3.11 Since the production of SES1, Hey Sprink has been designated as a LWS (Hey Sprink LWS). This site is also designated as an AWI site and reported in the main ES. The LWS covers an area of approximately 39.3ha and comprises a mixed plantation woodland supporting ancient woodland indicator species within the ground flora. Hey Sprink LWS is located south-east of the WCML, adjacent to the land required for the original scheme. The LWS is of county value.
- 3.3.12 Since the production of SES1, Wrinehill Wood (east of), previously designated as a Biodiversity Alert Site (BAS) and reported in the main ES, has been re-designated as a LWS (Wrinehill Wood (east of) LWS). The main ES reported this site as being of district/borough value. This site is also designated as an AWI site. The LWS covers an area of approximately 1.3ha and comprises an area of linear broadleaved woodland. Wrinehill Wood (east of) LWS is located east of Wrinehill Wood, adjacent to the land required for the original scheme. In acknowledgement of the re-designation of the site as a LWS, Wrinehill Wood (east of) is considered to be of county value.
- 3.3.13 Since the production of SES1, the extent of the area designated as Wrinehill Wood LWS has increased from approximately 26.2ha to approximately 27.8ha. The site is within an area listed as an Ancient Woodland Inventory (AWI) site. The LWS and AWI site were reported in the main ES and valued at county level. The LWS is one of the

¹⁴ HS2 Ltd (2018). *High Speed Two Phase 2a (West Midlands - Crewe) Background Information and Data: Ecology Map book*. Available online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/692669/G35_Ecological_baseline_data_map_book.pdf

best examples of ancient semi-natural woodland in Staffordshire, with intact typical ancient ground flora. Wrinehill Wood LWS is located 7m to the south-west of the original scheme. The LWS remains of county value.

Future baseline

Construction (2020)

- 3.3.14 The future baseline for construction in 2020 remains unchanged from that reported in the main ES Volume 5: Appendix CT-004-000.

Effects arising during construction

Avoidance and mitigation measures

- 3.3.15 The assessment assumes implementation of the measures set out within the draft Code of Construction Practice (CoCP)¹⁵, which includes translocation of protected species where appropriate.
- 3.3.16 No avoidance or mitigation measures, additional to those reported in the main ES and draft CoCP, are required.

Assessment of impacts and effects

- 3.3.17 All of the effects within this section are reported in the absence of other mitigation.

Designated sites

- 3.3.18 The main ES, as corrected within Section 2 of this report, reported the loss of approximately 300m² (1%) of ancient woodland from Hey Sprink (wood south-west of) LWS due to construction of the original scheme. The woodland is the reason for the LWS designation and its loss was reported as a permanent adverse effect on the structure and function of the site that is significant at the county level. Since the production of the main ES, the extent of the LWS designation has increased and the original scheme will result in the loss of approximately 0.2ha (7%) of the LWS. This will result in a different significant effect to that reported in the main ES. However, this will not change the level of significance of the effect reported in the main ES.
- 3.3.19 The main ES reported the loss of approximately 0.2ha (22%) of ancient woodland from the unnamed woodland south of Hey Sprink due to construction of the original scheme. Since the production of the SES₁, the unnamed woodland now referred to as Hey Sprink (south) has been designated as a LWS. The woodland is the reason for the designation of Hey Sprink (south) LWS and forms 85% of the LWS. The overall loss of approximately 0.2ha of woodland for the construction of the original scheme represents a new permanent adverse effect on the structure and function of Hey Sprink (south) that is significant at the county level.
- 3.3.20 The SES₂ change will not give rise to any further new or different significant effects on any other designated sites.

¹⁵ HS2 Ltd (2017). *High Speed Rail (West Midlands - Crewe) Environmental Statement*, Volume 5: Technical appendices, draft Code of Construction Practice (CT-003-000). Available online at <https://www.gov.uk/government/publications/draft-code-of-construction-practice-for-hs2-phase-2a>

Mitigation and residual effects

Other mitigation measures

- 3.3.21 No additional mitigation is identified since the loss of the ancient woodland at these LWSs was reported in the main ES as amended by SES1. The main ES identified woodland planting which partially compensated for the loss of ancient woodland, which is irreplaceable.

Summary of likely residual significant effects

- 3.3.22 The significant effects of the SES2 scheme in this area are unchanged from those reported in the main ES, as amended by SES1.

Cumulative effects

- 3.3.23 There are no new or different likely significant cumulative effects for ecology as a result of the SES2 changes relevant to this assessment acting in combination with any other SES2 changes.

3.4 Summary of new or different likely residual significant effects as a result of the SES2 changes

- 3.4.1 Additional geophysical surveys have identified a possible Bronze Age burial mound (WMH109) which will be completely removed by the construction of the original scheme. This will give rise to a new likely residual significant permanent moderate adverse effect for cultural heritage.

Part 2: Additional Provision 2 Environmental Statement

4 Summary of AP2 amendments in the Whitmore Heath to Madeley area

4.1 Introduction

4.1.1 In the Whitmore Heath to Madeley area, the following types of amendments are proposed in the AP2 revised scheme:

- engineering amendments;
- minor utility amendments; and
- other amendments requiring changes to Bill powers.

4.1.2 All dimensions in the following sections are approximate.

4.2 Engineering amendments

4.2.1 Engineering amendments will be required in the Whitmore Heath to Madeley area that will result in changes to the land or Bill powers required for the SES2 scheme. Table 5 provides a summary of the engineering amendments.

4.2.2 Figure 4 shows the locations of the engineering amendments.

Table 5: Summary of AP2 engineering amendments in the Whitmore Heath to Madeley area

| Name of the AP2 amendment | Description of the SES2 scheme | Description of the AP2 revised scheme |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Additional land required for provision of a power supply to Whitmore Heath tunnel</p> <p>AP2-004-001</p> <p>Map CT-05-228b, G10 to A6 to Map CT-05-229, J6 to C1, in the SES2 and AP2 ES Volume 2, CA4 Map Book and Maps CT-05-225-R3, CT-05-225-R2, CT-05-225-R1, CT-05-225, CT-05-226, CT-05-227-L1, CT-05-228-L1 and CT-05-228a in the SES2 and AP2 ES Volume 2, CA3 Map Book</p> | <p>Power connections would be required to operate the tunnel boring machines (TBM) for the construction of the Whitmore Heath and Madeley tunnels. The power connections would be retained permanently to be used for the operation of the tunnel, including lighting and ventilation systems.</p> <p>It was originally proposed that these power supplies would be provided by the statutory electricity undertaker, but in order to provide certainty that the scheme can be implemented within the construction programme it is necessary to include powers within the Bill.</p> | <p>Additional land, largely in the highway, will be required for provision of a 14.5km power supply connection from Meaford Bulk Supply Point to Whitmore Heath tunnel. The power supply route originates in the Stone and Swynnerton area (CA3) and ends at Whitmore tunnel south portal in the Whitmore Heath to Madeley area. This power supply will be used during construction to power the TBM and the Whitmore Heath tunnel satellite compound, and then for the permanent non-traction power supply and tunnel operations.</p> <p>Part of this amendment and relevant potential receptors lie within the Stone and Swynnerton area (CA3) and the assessment of effects on receptors within the Stone and Swynnerton area are reported in SES2 and AP2 ES Volume 2, Community area 3, Stone and Swynnerton.</p> |
| <p>Additional land required for modifications to the roundabout junction of the A500 Queensway/A519 Newcastle Road/A519 Clayton Road (Hanchurch Interchange) and the</p> | <p>The original scheme includes temporary construction traffic routes which would pass through the A500 Queensway/A519</p> | <p>Additional land will be required for permanent junction improvements to the existing roundabout junction of the A500 Queensway/A519 Newcastle Road/A519 Clayton Road (Hanchurch</p> |

SES2 and AP2 ES Volume 2 – Community area 4, Whitmore Heath to Madeley

| Name of the AP2 amendment | Description of the SES2 scheme | Description of the AP2 revised scheme |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>signalised crossroads junction of the A519 Newcastle Road/A5182 Trentham Road/B5038 Whitmore Road and a new satellite construction compound</p> <p>AP2-003-017</p> <p>Map CT-06-228-R4, G9 to F6, in the SES2 and AP2 ES Volume 2, CA3 Map Book and Map CT-05-228b-R4, G9 to F6, in the SES2 and AP2 ES Volume 2, CA4 Map Book</p> | <p>Newcastle Road and A519 Newcastle Road/A5182 Trentham Road junctions.</p> | <p>Interchange) and the signalised crossroads junction of the A519 Newcastle Road/A5182 Trentham Road/B5038 Whitmore Road. A noise fence barrier and landscape mitigation planting will be provided west of the A519 Newcastle Road and an area of hedgerow habitat creation will be provided adjacent to the eastbound A500 Queensway.</p> <p>A new satellite construction compound adjacent to the west of the A519 Clayton Road will be provided within the Whitmore Heath to Madeley area for the management of these junction works.</p> <p>The junction modifications and mitigation are in the Stone and Swynnerton area (CA3).</p> |
| <p>Additional land required and changes to Bill powers for changes to the vertical and horizontal alignment between Hatton South cutting and Madeley Bridleway 1 accommodation green overbridge</p> <p>AP2-004-002</p> <p>Map CT-06-227, C5 to A5, in the SES2 and AP2 ES Volume 2, CA3 Map Book</p> <p>Map CT-06-228b, J6 to A5, to Map CT-06-233, J6 to H6, in the SES2 and AP2 ES Volume 2, CA4 Map Book</p> <p>Due to the complexity of change associated with this amendment it has been sub-divided into the following two distinct elements (reported as Part 1 and Part 2 below) for ease of understanding. The AP is however assessed as one amendment.</p> | <p>See Parts 1 and 2 in subsequent rows.</p> | <p>See Parts 1 and 2 in subsequent rows.</p> |
| <p>Additional land required and a change to Bill powers for the change to the vertical alignment of the HS2 route from the Hatton South cutting to River Lea viaduct</p> <p>Part 1 of AP2-004-002</p> <p>Map CT-06-227, C5 to A5, in the SES2 and AP2 ES Volume 2, CA3 Map Book</p> <p>Map CT-06-228b, J6, to Map CT-06-232, H6, in the SES2 and AP2 ES Volume 2, CA4 Map Book</p> | <p>The HS2 route would cross over the Meece Brook and River Lea on viaduct, and under Whitmore Heath via the Whitmore Heath tunnel.</p> <p>This section of the HS2 route would include provision for Hatton South cutting, Hatton North cutting, Stableford South embankment, Stableford North embankment, Meece Brook viaduct, Meece embankment, Whitmore South cutting, Whitmore Heath tunnel (a cut and cover section and a bored tunnel section) and two porous portals, temporary realignment and reinstatement of the A53 Newcastle Road, Whitmore North cutting and retaining wall, Lea South embankment and River Lea viaduct.</p> <p>The Bill further provides for permanent landscape mitigation planting, landscape earthworks, balancing ponds, noise fence barriers adjacent to the Whitmore Heath tunnel northern porous</p> | <p>The vertical alignment between Hatton South cutting in the Stone and Swynnerton area (CA3), and River Lea viaduct in the Whitmore Heath to Madeley area will be amended.</p> <p>The vertical alignment through Meece Brook viaduct, Whitmore Heath tunnel and River Lea viaduct will be lowered.</p> <p>The vertical alignment through Whitmore North cutting and Lea South embankment will be raised by up to 3m.</p> <p>The vertical alignment changes will enable the southern porous portal of Whitmore Heath tunnel to be relocated 180m south-east along the HS2 route. The cut and cover section of Whitmore Heath tunnel will be changed to twin bore for the entire length of the tunnel. The length of the tunnel (including porous portals) will increase by 180m to 1.4km.</p> <p>Whitmore Wood overbridge will be replaced with Whitmore Wood underbridge, 350m to the north-west of</p> |

SES2 and AP2 ES Volume 2 – Community area 4, Whitmore Heath to Madeley

| Name of the AP2 amendment | Description of the SES2 scheme | Description of the AP2 revised scheme |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | portal and Whitmore Wood retaining wall, and footpath diversions. | <p>the position of Whitmore Wood overbridge.</p> <p>Additional land will be required to construct the relocated southern porous portal and amended tunnel. As a result of relocating the southern porous portal, the temporary realignment of the A53 Newcastle Road will no longer be required and will not be constructed. A change to Bill powers will be required for Whitmore Wood underbridge.</p> <p>There will be minor changes to the layout of landscape earthworks and landscape mitigation planting.</p> |
| <p>Additional land required and a change to Bill powers for the change to the horizontal alignment of the HS2 route from the southern extent of Stableford North embankment to Madeley Bridleway 1 accommodation green overbridge</p> <p>Part 2 of AP2-004-002</p> <p>Map CT-06-229, G6, to Map CT-06-233, H6, in the SES2 and AP2 ES Volume 2, CA4 Map Book</p> | <p>The HS2 route would cross over the Meece Brook and River Lea on viaduct, and under Whitmore Heath via the Whitmore Heath tunnel.</p> <p>This section of the HS2 route would include provision for Stableford North embankment, Meece Brook viaduct, Meece embankment, Whitmore South cutting, Whitmore Heath tunnel (a cut and cover section and a bored tunnel section) and two porous portals, temporary realignment and reinstatement of the A53 Newcastle Road, Whitmore North cutting and retaining wall, Lea South embankment, River Lea viaduct, Lea North embankment, Madeley cutting and Madeley Bridleway 1 accommodation green overbridge.</p> <p>The Bill further provides for: River Lea flood culvert and associated flood relief channels and a replacement floodplain storage area adjacent to the River Lea viaduct; permanent landscape mitigation planting and landscape earthworks; balancing ponds; noise fence barriers adjacent to the Whitmore Heath tunnel northern porous portal and Whitmore Wood retaining wall; and footpath realignments and diversions.</p> | <p>The horizontal alignment and track separation distance between Meece viaduct and Madeley Bridleway 1 accommodation green overbridge will be amended. The River Lea viaduct structure will be amended from two decks to a single deck supporting both HS2 tracks.</p> <p>The northern porous portal of Whitmore Heath tunnel will be relocated 10m to the south to accommodate the amendments to horizontal alignment and track separation.</p> <p>The horizontal alignment of Whitmore Wood retaining wall and Whitmore North cutting will be moved to the south-west by 10m.</p> <p>The track separation distance through Whitmore North cutting will be reduced, to allow for a reduction in the footprint of the HS2 route through Whitmore Wood ancient woodland.</p> <p>The horizontal alignment through Lea South embankment will be moved up to 9.4m to the south-west. As a result, the River Lea flood culvert, flood relief channel and replacement floodplain storage area will not need to be constructed.</p> <p>The vertical alignment of Manor Road overbridge will be increased by up to 1m to accommodate the amendments in horizontal alignment and track separation.</p> <p>Additional land will be required to accommodate the associated change to the highway earthworks. A change to Bill powers will be required for the works to Whitmore Heath tunnel northern porous portal, Whitmore North cutting, Lea South embankment and Manor Road overbridge.</p> <p>There will be minor changes to the realignments and diversions of Whitmore Footpath 6 and Madeley Footpath 14, adjacent to Whitmore North cutting and Lea South embankment, and minor changes to the</p> |

SES2 and AP2 ES Volume 2 – Community area 4, Whitmore Heath to Madeley

| Name of the AP2 amendment | Description of the SES2 scheme | Description of the AP2 revised scheme |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | layout of landscape earthworks and landscape mitigation planting. |
| <p>Additional land required and a change to Bill powers for modifications to the A51 Stone Road/Nantwich Road/A53 Newcastle Road junction</p> <p>AP2-004-003</p> <p>Map CT-06-230-L3, D5 to B9, in the SES2 and AP2 ES Volume 2, CA4 Map Book</p> | <p>Construction traffic would enter onto the A53 Newcastle Road at Baldwin's Gate and travel south to join the A51 Stone Road. The construction traffic route would not include the A53 Newcastle Road south of the junction with the A51 Stone Road.</p> <p>There were no changes proposed to the existing junction of the A51 Stone Road and the A53 Newcastle Road. The staggered crossroads junction is situated 3.5km south-west of the HS2 route.</p> | <p>Additional land and a change to Bill powers will be required for changes at two junctions located close to each other on the A53 Newcastle Road.</p> <p>Traffic signals will be installed at the eastern A53 Newcastle Road/A51 Stone Road junction.</p> <p>At the western A53 Newcastle Road/A51 Nantwich Road junction, traffic signals will be installed and the A53 Newcastle Road will be diverted. The diversion will require hedgerow habitat creation along both sides of the diverted A53 Newcastle Road.</p> |
| <p>Additional land required and a change to Bill powers for provision of a public right of way over Whitmore Heath tunnel north porous portal</p> <p>AP2-004-004</p> <p>Map CT-06-230, C6 to D3, and Map CT-06-230, C6 to D3, in the SES2 and AP2 ES Volume 2, CA4 Map Book.</p> | <p>Snape Hall Road would be stopped up where it crosses the HS2 route at the Whitmore Heath tunnel north porous portal. Two turning heads would be provided for vehicle access on the retained sections of Snape Hall Road, one to the south of the HS2 route and one to the north.</p> <p>Landscape mitigation planting to the south and west of the porous portal would provide landscape integration and visual screening for residents of Whitmore Heath.</p> | <p>Snape Hall Road, on the northern side of the HS2 route, will be permanently stopped up to vehicular traffic at the junction with Dab Green Lane, but will be retained as accommodation access only.</p> <p>The turning head to the north of the HS2 route will be removed.</p> <p>A new public right of way, Whitmore New Footpath, will be provided between the turning head to the south of the HS2 route and Dab Green Lane, via the stopped up section of Snape Hall Road. The total length of Whitmore New Footpath will be approximately 670m, comprising 320m of new footpath around the portal, and 350m that follows the stopped up section of Snape Hall Road.</p> |
| <p>Additional land for new pipework from the borrow pit west of Netherset Hey Farm for groundwater recharge to River Lea</p> <p>AP2-004-005</p> <p>Map CT-05-232, I4 to H8, in the SES2 and AP2 ES Volume 2, CA4 Map Book</p> | <p>A borrow pit to the west of Netherset Hey Farm for the extraction of sand and gravel for construction would be provided and include mitigation measures to recirculate groundwater to the River Lea, as a result of the excavation and dewatering of the borrow pit. A minor tributary of the River Lea would be temporarily diverted.</p> | <p>Additional land will be temporarily required for a new pipe route, 700m in length within a corridor 10m wide, from the borrow pit to the west of Netherset Hey Farm to the River Lea for the discharge of groundwater from excavation and dewatering of the borrow pit.</p> |
| <p>Change to Bill powers for HS2 maintenance access to River Lea viaduct</p> <p>AP2-004-006</p> <p>Map CT-05-232, G10 to E8, and Map CT-06-232, G10 to E8, in the SES2 and AP2 ES Volume 2, CA4 Map Book</p> | <p>A farm access track from Manor Road to the River Lea viaduct would be permanently upgraded to provide maintenance access to the HS2 route. An area of hedgerow habitat creation and grassland habitat creation would be provided to the north of the HS2 maintenance access.</p> <p>During construction, the area between the HS2 maintenance access and the area of habitat creation would be used as a temporary material stockpile.</p> | <p>A change to Bill powers will be required to relocate both the HS2 access route for the northern abutment of the River Lea viaduct and the junction between Manor Road and the HS2 maintenance access, approximately 350m to the north of the location in the original scheme.</p> |
| <p>Additional land required for provision of a power supply to Madeley tunnel</p> <p>AP2-004-007</p> | <p>Power connections will be required to operate the TBM for the construction of the Whitmore Heath and Madeley tunnels. The power connections will be</p> | <p>Additional land, largely in the highway, will be required for provision of an 11.5km power supply connection from Newcastle Bulk Supply Point to Madeley</p> |

SES2 and AP2 ES Volume 2 – Community area 4, Whitmore Heath to Madeley

| Name of the AP2 amendment | Description of the SES2 scheme | Description of the AP2 revised scheme |
|--------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>CT-05-228b, G10, F10, E10, E9 to D7 and D6 to A6, in the SES2 and AP2 ES Volume 2, CA4 Map Book</p> | <p>retained permanently to be used for the operation of the tunnel, including lighting and ventilation systems.</p> <p>It was originally proposed that these power supplies would be provided by the statutory electricity undertaker, but in order to provide certainty that the scheme can be implemented within the construction programme it is necessary to include powers within the Bill.</p> | <p>tunnel. This power supply will be used during construction to power the TBM and the Madeley Tunnel (south) satellite compound, and then for the permanent non-traction power supply and tunnel operations.</p> <p>Madeley Footpath 33 will be temporarily closed whilst the power cable is installed below the WCML and the River Lea by directional drilling.</p> |

4.2.3 Amendments in the Whitmore Heath to Madeley area result in changes to waste arisings, which are reported in Volume 5: Appendix WM-001-000 of the SES2 and AP2 ES.

4.2.4 An assessment of the likely significant environmental effects associated with the disposal of construction, demolition, excavation and operational waste has been undertaken route-wide for the AP2 revised scheme. See Volume 3, Section 11 of the SES2 and AP2 ES for details of this assessment.

4.3 Minor utility amendments

4.3.1 Amendments to minor utilities will be required in the Whitmore Heath to Madeley area to provide connections to construction compounds and to maintain continuity of supply in the area. This will result in changes to the land or Bill powers required for the SES2 scheme where relevant. Typically, works associated with minor utility amendments will be small in scale and similar to the types of works undertaken routinely by utility providers in the normal course of their activities. The duration of minor utility works will generally be short term. Provision of access to adjacent properties will usually be maintained during the works with alternative access arrangements being made where necessary. Where relevant, the implementation of the works will be subject to appropriate traffic management measures to ensure that disruption to non-motorised users and vehicular traffic is reduced insofar as reasonably practicable. Table 6 provides a summary of the minor utility amendments and the changes to land or Bill powers required. Consideration has been given to the potential for new or different likely significant cumulative effects as a result of the minor utility amendments acting in combination with other SES2 changes and reported where relevant.

4.3.2 Figure 5 shows the general location of the minor utility amendments.

Table 6: Summary of AP2 minor utility amendments in the Whitmore Heath to Madeley area

| Name of the AP2 minor utility amendment | Description of the SES2 scheme | Description of the AP2 revised scheme |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Additional land and change in Bill powers for the diversion of a Cadent medium pressure gas main from Snape Hall Road to Common Lane and Heath Road AP2-004-101 Map CT-06-230, G8 to C6, in the SES2 and AP2 ES Volume 2, CA4 Map Book | No provision was made for the permanent diversion of a Cadent medium pressure gas main from Snape Hall Road to Common Lane and Heath Road. | Additional land and change in Bill powers will be required for the permanent diversion of a Cadent medium pressure gas main in Snape Hall Road, 1.8km in length, along Common Lane and Heath Road, crossing the HS2 route above the Whitmore Heath tunnel. |
| Additional land for a new Severn Trent Water water mains supply to the Whitmore Heath tunnel north portal building AP2-004-102 Map CT-06-230, A9 to B6, in the SES2 and AP2 ES Volume 2, CA4 Map Book | Land would be permanently required for a new permanent Severn Trent Water water mains supply to the Whitmore Heath tunnel north portal building, 150m in length, from Snape Hall Road, along a proposed HS2 access track, to the Whitmore Heath tunnel north portal building. | Additional land will be permanently required for a new permanent Severn Trent Water water mains supply to the Whitmore Heath tunnel north portal building, 480m in length, running along Whitmore Footpath 5 and an HS2 access track to the Whitmore Heath tunnel north portal building. |
| Additional land and change in Bill powers for the overhead and underground diversion of a Western | Land would be permanently required for the permanent overhead and underground diversion of a Western Power Distribution 11kV overhead line, 710m in length, from an existing | Additional land and change in Bill powers will be required for the permanent overhead and underground diversion of a Western Power Distribution 11kV overhead line, 890m in |

SES2 and AP2 ES Volume 2 – Community area 4, Whitmore Heath to Madeley

| Name of the AP2 minor utility amendment | Description of the SES2 scheme | Description of the AP2 revised scheme |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Power Distribution 11kV overhead line near Manor Farm</p> <p>AP2-004-103</p> <p>Map CT-06-232, D8 to D5, in the SES2 and AP2 ES Volume 2, CA4 Map Book</p> | <p>Western Power Distribution pole 270m south of Hey House, crossing the HS2 route 150m south of Manor Road overbridge to an existing pole 350m east of Manor Farm. The eastern section of the diversion, 460m in length, running parallel to the HS2 route would be an overhead line. The western section of the diversion, 250m in length, crossing the HS2 route would be an underground cable.</p> | <p>length, from an existing Western Power Distribution pole 270m south of Hey House, crossing the HS2 route 170m south of the Manor Road overbridge, along an HS2 access track, and crossing the Manor Road diversion to an existing Western Power Distribution pole east of Manor Farm. The eastern section of the diversion, 460m in length, running parallel to the HS2 route will be an overhead line. The western section of the diversion, 430m in length, crossing the HS2 route will be an underground cable.</p> |
| <p>Additional land for a new Severn Trent Water water mains supply to the Madeley tunnel north portal building</p> <p>AP2-004-104</p> <p>Map CT-06-233-R1, G10 to D10, Map CT-06-233, G1 to A5, and Map CT-06-234, J4 to H5, in the SES2 and AP2 ES Volume 2, CA4 Map Book</p> | <p>Land would be permanently required for a new permanent Severn Trent Water water mains supply to the Madeley tunnel north portal building, 940m in length, from the access track to Moss Farm, along Bower End Lane, Madeley Bridleway 5 realignment and the proposed HS2 access track to the Madeley tunnel north portal building.</p> | <p>Additional land will be required for a new permanent Severn Trent Water water mains supply to the Madeley tunnel north portal building, 2.4km in length, from 320m south of Station Road, running adjacent to Station Road, along the A525 Bar Hill Road, Moss Lane and Bower End Lane, crossing the WCML, continuing along Bower End Lane, Madeley Bridleway 5 realignment and the HS2 access track to the Madeley tunnel north portal building.</p> |
| <p>Additional land for the diversion of a Severn Trent Water water mains supply at the A525 Bar Hill Road</p> <p>AP2-004-105</p> <p>Map CT-06-233, G7 to G3, in the SES2 and AP2 ES Volume 2, CA4 Map Book</p> | <p>No provision was made for the permanent diversion of a Severn Trent Water water mains supply at the A525 Bar Hill Road.</p> | <p>Additional land will be required for the permanent diversion of a Severn Trent Water water mains supply at the A525 Bar Hill Road, 700m in length, crossing the HS2 route at the A525 Bar Hill overbridge.</p> |
| <p>Additional land for a new Severn Trent Water water mains supply to the Madeley tunnel south portal building</p> <p>AP2-004-106</p> <p>Map CT-06-233, J2 to G1, and Map CT-06-233-R1, I10 to G10</p> | <p>Land would be permanently required for a new permanent Severn Trent Water water mains supply to the Madeley tunnel south portal building, 300m in length, from the A525 Bar Hill Road, along a proposed HS2 access track, to the Madeley tunnel south portal building.</p> | <p>Additional land will be required for a new permanent Severn Trent Water water mains supply to the Madeley tunnel south portal building, 1.6km in length, from 320m south of Station Road, running adjacent to Station Road, along the A525 Bar Hill Road and crossing the WCML, continuing along A525 Bar Hill Road and an HS2 access track to the Madeley tunnel south portal building.</p> |
| <p>Additional land for the removal of an overhead Openreach telecommunications line near Moor Hall</p> <p>AP2-004-107</p> <p>Map CT-05-233, F5 to C3, in the SES2 and AP2 ES Volume 2, CA4 Map Book</p> | <p>No provision was made for permanent removal of an overhead Openreach telecommunications line near Moor Hall.</p> | <p>Additional land will be temporarily required for the permanent removal of an overhead Openreach telecommunications line near Moor Hall. The removal will be 680m in length, from Barr Hill Cottage, parallel to the eastern side of the HS2 route, to Bower End Lane.</p> |
| <p>Additional land for the underground diversion of Western Power Distribution 11kV and low voltage overhead lines near Bower End Farm</p> <p>AP2-004-108</p> <p>Map CT-06-233, A5 to A3, and CT-06-234, J5 to I3, in the SES2 and AP2 ES Volume 2, CA4 Map Book</p> | <p>Land would be permanently required for the permanent underground diversion of an 11kV overhead line, 120m in length, from Bower End Farm, crossing a proposed HS2 access track to the Madeley tunnel north portal building to an existing Western Power Distribution pole, 50m west of Bower End Farm.</p> | <p>Additional land will be required for the permanent underground diversion of Western Power Distribution 11kV overhead line near Bower End Farm, 170m in length, crossing an HS2 access track to the Madeley tunnel north portal building to an existing Western Power Distribution pole, 90m west of Bower End Farm.</p> |

SES2 and AP2 ES Volume 2 – Community area 4, Whitmore Heath to Madeley

| Name of the AP2 minor utility amendment | Description of the SES2 scheme | Description of the AP2 revised scheme |
|-----------------------------------------|------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | A low voltage overhead line, 50m in length, 20m west of Bower End Farm would be removed. | Additional land will also be required for the permanent underground diversion of a Western Power Distribution low voltage overhead line, 140m in length, from a pole 20m north of Bower End Farm to a location west of Bower End Farm. |

4.4 Other amendments requiring changes to Bill powers

- 4.4.1 Since submission of the Bill, the need for amendments to the Bill plans and Schedule 8 of the Bill ('Lands where powers of acquisition are limited to acquisition of rights or impositions of restrictive covenants') has been identified.
- 4.4.2 The amendments relate to the rights for use of certain plots of land, which have been identified on the Bill plans and in Schedule 8 of the Bill as only being required for access during the construction phase. However, it has been ascertained that these land plots will also be required by the nominated undertaker, Network Rail and third party utility providers during the operational phase for access for inspection and maintenance purposes.
- 4.4.3 Regular inspection and maintenance access will be required to assets such as the following:
- habitat creation areas;
 - line-side equipment;
 - railway drainage system; and
 - utilities.
- 4.4.4 During operation, vehicular access will be required and the frequency will vary depending on the asset and maintenance activities. Typically, access will be required 2-4 times per year by two light goods vehicles (LGVs) (e.g. long wheel-base pick-up vehicles).
- 4.4.5 The use of these land plots for maintenance and operation access was considered in the preparation of the main ES. Given the limited frequency of this access, it was concluded that this would not result in any new or different significant effects. As this access was considered in the main ES, these amendments are not considered to require further assessment of the environmental effects or mitigation additional to that set out in the main ES with respect to any environmental topics.
- 4.4.6 Table 7 provides details of where there has been a need to amend the Bill plans and Schedule 8 of the Bill for the Whitmore Heath to Madeley area.

Table 7: Summary of other amendments requiring changes to Bill powers in the Whitmore Heath to Madeley area

| Name of amendment | Description of the original scheme (Schedule 8 of the Bill) | Description of the AP2 revised scheme |
|------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|------------------------------------------------------|
| Additional access rights to land plot AP2-21 in the parish of Whitmore AP2-004-201 Bill plan replacement sheet 1-49 | Provision of access for construction | Provision of access for construction and maintenance |
| Additional access rights to land plots AP2-7 and AP2-11 in the parish of Madeley AP2-004-202 Bill plan replacement sheet 1-50,1-53, 1-54 | Provision of access for construction | Provision of access for construction and maintenance |

5 Assessment of engineering amendments in the Whitmore Heath to Madeley area

5.1 Additional land required for provision of a power supply to Whitmore Heath tunnel (AP2-004-001)

- 5.1.1 Part of this amendment and relevant potential receptors lie within the Stone and Swynnerton area (CA3). A detailed description of the amendment and assessment of effects within the Stone and Swynnerton area is reported in SES2 and AP2 ES Volume 2, Community area 3, Stone and Swynnerton. Part of this amendment lies within the Whitmore Heath to Madeley area and the works associated with this amendment and assessment of effects on receptors within the Whitmore Heath to Madeley area are described below.
- 5.1.2 The Bill provides for a cut and cover section of Whitmore Heath tunnel, 240m in length and up to 17m in depth, continuing into a twin bored tunnel, 690m in length and up to 50m in depth, passing under Whitmore Heath. See Volume 2: Map CT-06-230, H6 to C5, in the main ES Volume 2, CA4 Map Book.
- 5.1.3 A tunnel boring machine (TBM) will be used to construct the twin bored tunnel. The TBM will be driven from the Whitmore Heath (south) tunnelling facility and logistics area. Power connections will be required to provide power to the Whitmore Heath tunnel satellite compound and to operate the TBM for the construction of the Whitmore Heath tunnel. The power connection will be retained permanently to be used for the operation of the tunnel.
- 5.1.4 It was originally proposed that the power supply connection would be provided by the statutory electricity undertaker, but in order to provide certainty that the scheme can be implemented within the construction programme it is necessary to include powers within the Bill.
- 5.1.5 Since submission of the Bill, further design development has been undertaken to identify a route for a power line, consisting of two sets of three 33kV cables to ensure necessary supply resilience, laid underground in a single trench and approximately 14.5km in length, to supply power to the TBM for the construction of Whitmore Heath tunnel. The power line will also provide a permanent power supply for the lighting, communications, signalling and ventilation systems of the tunnel, and non-traction power during operation.
- 5.1.6 The power line will pass through land within the Stone and Swynnerton area and the Whitmore Heath to Madeley area. A description of the works associated with this amendment in the Whitmore Heath to Madeley area is below.
- 5.1.7 Within the Whitmore Heath to Madeley area, the power line will be installed in the verge or carriageway of existing roads, except for a 500m length which will be installed in an HS2 access road between the A53 Newcastle Road and the southern porous portal of Whitmore Heath tunnel. See Map CT-05-229, A6 to B6, in the SES2 and AP2 ES Volume 2, CA4 Map Book.
- 5.1.8 The power line will originate at an existing Western Power Distribution sub-station, referred to as Meaford Bulk Supply Point, located between Meaford Road and the

Trent and Mersey Canal to the east of the HS2 route, in the Stone and Swynnerton area. New 33kV circuit breakers and 132kV control panels will be installed at Meaford Bulk Supply Point, which will be housed in a new building approximately 35m by 35m. New 132/33kV transformers will also be installed and existing infrastructure will be modified to accommodate the new connection.

- 5.1.9 Within the Stone and Swynnerton area, the route of the power line will run along agricultural land and public roads, before being ducted beneath the M6, using directional drilling, and continuing along public roads and access roads before entering the Whitmore Heath to Madeley area.
- 5.1.10 The power line will continue into the Whitmore Heath to Madeley area and run north along Bent Lane to the junction with A53 Newcastle Road. The power supply will initially be installed as a temporary connection in the existing Bent Lane, before being installed permanently as part of the realigned Dog Lane and the Bent Lane (North) diversion. The route will run west along the A53 Newcastle Road to the junction with an HS2 access road. The power line will then run along this access road and connect into the southern porous portal of Whitmore Heath tunnel. See Map CT-05-228a, E9 to A6, in the SES2 and AP2 ES Volume 2, CA3 Map Book and Map CT-05-228b, E9 to A6, to Map CT-05-229, J6 to B5, in the SES2 and AP2 ES Volume 2, CA4 Map Book.
- 5.1.11 The amendment will be constructed over a period of approximately six months, commencing in 2022. Works will be managed from Whitmore Heath tunnel satellite compound, with mobile staff welfare units in the Stone and Swynnerton area.
- 5.1.12 The land required for the installation of the power line is outside the limits of the Bill and will result in the requirement for an additional 17.1ha of land. See Maps CT-05-225-R3, CT-05-225-R2, CT-05-225-R1, CT-05-225, CT-05-226, CT-05-227, CT-05-228-L1 and CT-05-228a in the SES2 and AP2 ES Volume 2, CA3 Map Book and Map CT-05-229 and Map CT-05-230 in the SES2 and AP2 ES Volume 2 CA4 Map Book. It is assumed that all of the additional land will be returned to its existing use following construction.

Topics included in the AP2 assessment

- 5.1.13 Within the Whitmore Heath to Madeley area, this amendment is considered to require reassessment of the environmental effects and mitigation in the main ES, as amended by SES1 and SES2, for the following topics: cultural heritage; traffic and transport; and water resources and flood risk. These are reported in this section.
- 5.1.14 There are also community; cultural heritage; ecology and biodiversity; traffic and transport and water resources and flood risk receptors in the Stone and Swynnerton area, which are assessed and reported in SES2 and AP2 ES Volume 2, Community area 3, Stone and Swynnerton.

Cultural heritage

Scope, assumptions and limitations

- 5.1.15 The assessment scope, key assumptions and limitations for cultural heritage are as set out in Volume 1, the Scope and Methodology Report (SMR)¹⁶ and SMR Addendum¹⁷ of the main ES and SMR Addendum 2 (see SES2 and AP2 ES Volume 5: Appendix CT-001-000).
- 5.1.16 The amendment has the potential to result in new or different significant temporary construction effects only. Therefore, there is no permanent construction or operational assessment for cultural heritage.

Existing environmental baseline

- 5.1.17 The baseline cultural heritage information for the Whitmore Heath to Madeley area is as described in Volume 2, CA4, Section 7 of the main ES.
- 5.1.18 Whitmore Conservation Area (WHM019), a designated asset of moderate value, lies partially within the land required for the amendment.
- 5.1.19 Further information about this asset is provided in the main ES Volume 5: Appendix CH-002-004 and Map Series CH-01, CH-02 and CH-03 in the main ES Cultural heritage Map Book.

Future environmental baseline

Construction (2020)

- 5.1.20 The future baseline for construction in 2020 remains unchanged from that reported in the main ES Volume 5: Appendix CT-004-000.

Effects arising during construction

Avoidance and mitigation measures

- 5.1.21 No avoidance or mitigation measures, additional to those reported in the main ES and draft Code of Construction Practice (CoCP)¹⁸, are identified.

Assessment of impacts and effects

- 5.1.22 The main ES reported a temporary minor adverse effect, which is not significant, on Whitmore Conservation Area (WHM019), a designated asset of moderate value. The conservation area derives much of its significance from the historic rural village setting. The amendment will further affect the setting of the conservation area. This will give rise to a new temporary medium adverse impact and a new temporary moderate adverse effect, which is significant.

¹⁶ HS2 Ltd (2017). *High Speed Rail (West Midlands - Crewe) Environmental Statement*, Volume 5: Technical appendices, Environmental Impact Assessment Scope and Methodology Report (Appendix CT-001-001). Available online at: <https://www.gov.uk/government/publications/scope-and-methodology-report-for-hs2-phase-2a>

¹⁷ HS2 Ltd (2017). *High Speed Rail (West Midlands - Crewe) Environmental Statement*, Volume 5: Technical appendices, Environmental Impact Assessment Scope and Methodology Report Addendum (Appendix CT-001-002). Available online at: <https://www.gov.uk/government/publications/scope-and-methodology-report-for-hs2-phase-2a>

¹⁸ HS2 Ltd (2017). *High Speed Rail (West Midlands - Crewe) Environmental Statement*, Volume 5: Technical appendices, draft Code of Construction Practice (CT-003-000). Available online at <https://www.gov.uk/government/publications/draft-code-of-construction-practice-for-hs2-phase-2a>

- 5.1.23 For further information see the SES2 and AP2 ES Volume 5: Cultural heritage Map Book and the SES2 and AP2 ES Volume 5: Appendix CH-003-000.

Mitigation and residual effects

Other mitigation measures

- 5.1.24 No mitigation measures, additional to those reported in the main ES and draft CoCP, are identified.

Summary of likely residual significant effects

- 5.1.25 The temporary effects of construction activity on the setting of Whitmore Conservation Area (WHM019) have been considered. However, they are largely reversible in nature and will be restricted to the duration of the construction works. Therefore, the amendment will not change the level of significance of the permanent effects reported in the main ES.

Cumulative effects

- 5.1.26 There are no new or different likely significant cumulative effects for cultural heritage as a result of the amendment acting in combination with any other AP2 amendments.

Traffic and transport

Scope, assumptions and limitations

- 5.1.27 The assessment scope, key assumptions and limitations for traffic and transport are as set out in Volume 1, the SMR and SMR Addendum of the main ES.
- 5.1.28 This amendment has the potential to result in new or different significant construction effects only. Therefore, there is no operational assessment for traffic and transport.

Existing environmental baseline

- 5.1.29 The baseline traffic and transport information for the Whitmore Heath to Madeley area is as described in Volume 2 CA4, Section 14 of the main ES.
- 5.1.30 The M6 runs in a north-west to south-east alignment to the east of the HS2 route in the Whitmore Heath to Madeley area. The local roads in the area are Bent Lane and the A53 Newcastle Road/Whitmore Road.

Future environmental baseline

Construction (2023)

- 5.1.31 The future baseline for construction in 2023 remains unchanged from that reported in the main ES Volume 5: Appendix CT-004-000.

Effects arising during construction

Avoidance and mitigation measures

- 5.1.32 No avoidance or mitigation measures additional to those reported in the main ES and draft CoCP are required.

Assessment of impacts and effects

- 5.1.33 The amendment will require works in or adjacent to the carriageway which will be undertaken through local traffic management measures. Local traffic management measures are likely to require temporary lane closures and/or full carriageway closures. A closure to through traffic of Bent Lane will be required, with associated local diversion routes. However, these will be for a short duration of no more than four weeks. The works will take place on short sections of Bent Lane at any given time and move along the route so that access to properties can be maintained. The closure of Bent Lane will increase journey distance by up to 6.5km. The amendment will give rise to a new temporary minor adverse effect on traffic flows and delays to vehicle users of Bent Lane due during the works to temporary traffic diversion of traffic, which is significant.
- 5.1.34 Local traffic management measures on the A53 Newcastle Road are likely be required to include lane restrictions with shuttle working¹⁹ (off-peak where reasonably practicably possible) and temporary lane closures. Where lane closures are required, these will typically be of a short duration (less than four weeks) and access to properties will be maintained.
- 5.1.35 For further information see the SES2 and AP2 ES Volume 5: Traffic and transport Map Book.

Mitigation and residual effects

Other mitigation measures

- 5.1.36 No mitigation measures, additional to those reported in the main ES and draft CoCP, are required.

Summary of likely residual significant effects

- 5.1.37 During the works, the amendment will give rise to a new likely residual significant temporary minor adverse effect on traffic flows and delays during construction for vehicle users of Bent Lane.

Cumulative effects

- 5.1.38 There are no new or different likely significant cumulative effects for traffic and transport as a result of the amendment acting in combination with any other AP2 amendments or any relevant committed development.

¹⁹ Shuttle working means an area of carriageway where, owing to a temporary restriction, traffic has to flow first in one direction then in the other in a controlled manner. The definition is contained in: Department for Transport/Highways Agency (2009). *Traffic Signs Manual, Chapter 8, Traffic Safety Measures and Signs for Road Works and Temporary Situations*, Part 1: Design, p. 298. Available online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/203669/traffic-signs-manual-chapter-08-part-01.pdf

Water resources and flood risk

Scope, assumptions and limitations

- 5.1.39 The assessment scope, key assumptions and limitations for water resources and flood risk are as set out in Volume 1, the SMR and SMR Addendum of the main ES and SMR Addendum 2 (see SES2 and AP2 ES Volume 5: Appendix CT-001-000).
- 5.1.40 This amendment has the potential to result in new or different significant construction effects only. Therefore, there is no operational assessment for water resources and flood risk.

Existing environmental baseline

- 5.1.41 The baseline water resources information for the Whitmore Heath to Madeley area is as described in Volume 2, CA4, Section 15 of the main ES. Further details relating to water resources and flood risk for this area are provided in Volume 5: Appendix WR-002-004 and Appendix WR-003-004 and the Water resources and flood risk Map Book of the main ES.
- 5.1.42 This amendment is located within areas of source protection zone 1 (SPZ1) associated with public water abstractions, including the public groundwater supply abstraction near Whitmore, which are very high value receptors, and will involve construction activities of a nature and scale that have potential water quality implications.

Future environmental baseline

Construction (2020)

- 5.1.43 The future baseline for construction in 2020 remains unchanged from that reported in the main ES, Volume 5: Appendix CT-004-000.

Effects arising from construction

- 5.1.44 The main ES reported no significant effects on groundwater quality due to site runoff and increased pollution risk in the vicinity of this amendment. The amendment has the potential to give rise to temporary adverse impacts on groundwater quality which could affect the abstraction at Whitmore. However, the amendment will be constructed in accordance with the measures specifically designed to safeguard water resources outlined in the draft CoCP. Therefore, the amendment will not give rise to a new or different significant effect and will not change the level of significance of the effects reported in the main ES.

Cumulative effects

- 5.1.45 There are no new or different likely significant cumulative effects for water resources and flood risk as a result of the amendment acting in combination with any other AP2 amendments.

Summary of new or different likely residual significant effects as a result of the amendment

- 5.1.46 During the works, the amendment will give rise to a new likely residual significant temporary minor adverse effect on traffic flows and delays during construction for vehicle users of Bent Lane.

5.2 Additional land required for modifications to the roundabout junction of the A500 Queensway/A519 Newcastle Road/A519 Clayton Road (Hanchurch Interchange) and the signalised crossroads junction of the A519 Newcastle Road/A5182 Trentham Road/B5038 Whitmore Road and a new temporary satellite construction compound (AP2-003-017)

- 5.2.1 The majority of this amendment and all relevant potential receptors lie within the Stone and Swynnerton area (CA3), therefore a detailed description of the amendment and assessment of effects are reported in SES2 and AP2 ES, Volume 2, Community area 3, Stone and Swynnerton. Part of this amendment lies within the Whitmore Heath to Madeley area and the works associated with this amendment within the Whitmore Heath to Madeley area are reported below.
- 5.2.2 The Bill provides for temporary construction traffic routes which pass through the A500 Queensway/A519 Newcastle Road and A519 Newcastle Road/A5182 Trentham Road junctions in the Stone and Swynnerton area.
- 5.2.3 Since submission of the Bill, a requirement has been identified to improve traffic flow through these junctions, during construction. To achieve this, junction improvements at the existing Hanchurch Interchange roundabout and signalised crossroads will be provided.
- 5.2.4 A new satellite construction compound (A519 Junction Modifications satellite compound) will be provided for management of the junction modifications and will be located in the Whitmore Heath to Madeley area to the west of the A519 Clayton Road, 50m north of the works to the Hanchurch Interchange roundabout, adjacent to the boundary with the Stone and Swynnerton area. See Map CT-05-228-R4, F6, in the SES2 and AP2 ES Volume 2, CA3 Map Book, and CT-05-228b-R4, F6 in the SES2 and AP2 ES Volume 2, CA4 Map Book. The A519 Junction Modifications satellite construction compound will be operational for one year, commencing in 2020, and will support an average of 10 workers per day (25 workers at peak times). Access to the new compound will be from the A519 Clayton Road and will share an existing entrance to Severn Trent Water Clayton Road sewerage pumping station and an existing Western Power Distribution electricity substation, which is sited in the field to the south-west of the proposed construction compound.
- 5.2.5 The junction modifications will be constructed over a period of up to one year, commencing in 2020.
- 5.2.6 The land required for the A519 Junction Modifications satellite compound is outside the limits of the Bill and will result in the requirement for an additional 0.2ha of land in the Whitmore Heath to Madeley area. See Map CT-05-228b-R4, F6 in the SES2 and

AP2 ES Volume 2, CA4 Map Book. It is assumed that all of the additional land will be returned to its existing use following construction.

Topics included in the AP2 assessment

- 5.2.7 This amendment is not considered to require a reassessment of the environmental effects or mitigation within the Whitmore Heath to Madeley area, as set out in the main ES, as amended by SES1 and SES2, with respect to any environmental topics.
- 5.2.8 The assessment of the changes to construction traffic flows and traffic related effects as a result of this AP2 amendment in combination with all SES2 changes and AP2 amendments, is reported in Section 7.
- 5.2.9 There are community; cultural heritage; ecology and biodiversity; landscape and visual; sound, noise and vibration; traffic and transport and water resources and flood risk receptors in the Stone and Swynnerton area, which are assessed and reported in SES2 and AP2 ES Volume 2, Community area 3, Stone and Swynnerton.

5.3 Additional land required and changes to Bill powers for changes to the vertical and horizontal alignment between Hatton South cutting and Madeley Bridleway 1 accommodation green overbridge (AP2-004-002)

- 5.3.1 The majority of this amendment and all relevant potential receptors lie within the Whitmore Heath to Madeley area, therefore a detailed description of the amendment and assessment of effects are reported below. Part of this amendment lies within the Stone and Swynnerton area (CA3) and the works associated with this amendment within the Stone and Swynnerton area are reported in SES2 and AP2 ES, Volume 2, Community area 3, Stone and Swynnerton.
- 5.3.2 The Bill provides for the HS2 route within the Hatton South cutting which would continue onto the Stableford South embankment. This section of the route would be within the Stone and Swynnerton area.
- 5.3.3 The HS2 route would proceed into the Whitmore Heath to Madeley area, west of Shelton under Harley Farm, and would continue onto the Stableford North embankment into the Meece Brook Valley. The route would continue onto the Meece Brook viaduct, followed by the Meece embankment. The route would then continue into the Whitmore South cutting before passing under the A53 Newcastle Road and into a cut and cover then twin bore tunnel under Whitmore Heath.
- 5.3.4 The route would then emerge from the Whitmore Heath tunnel and continue through a section of Whitmore Wood ancient woodland within the Whitmore North cutting. The route would enter the valley of the River Lea on Lea South embankment and continue onto the River Lea viaduct, passing over the River Lea, the West Coast Main Line (WCML), the disused Silverdale line of the Stoke to Market Drayton Railway and the Madeley Chord. The route would then continue on Lea North embankment until passing under Manor Road overbridge.
- 5.3.5 The HS2 route would continue into Madeley cutting, passing under the A525 Bar Hill overbridge before entering a porous portal and Madeley tunnel, to the west of Madeley, through part of Barhill Wood ancient woodland.

5.3.6 This section of HS2 route is illustrated on Map CT-06-227 to CT-06-228a in the main ES Volume 2, CA3 Map Book and Maps CT-06-229 to CT-06-233 in the main ES Volume 2, CA4 Map Book.

5.3.7 Due to the complexity of the amendment resulting from the changes to alignment, this amendment is described in the following two parts:

- Part 1 – amendments to the vertical alignment of the HS2 route from Hatton South cutting to River Lea viaduct. The land required to construct the vertical alignment amendments is outside the limits of the Bill and will result in the permanent requirement for approximately 15ha of additional land. A change in Bill powers is also required to alter the limits of deviation²⁰ as set out in the Bill.
- Part 2 – amendments to the horizontal alignment of the HS2 route from Stableford North embankment to Madeley Bridleway 1 accommodation green overbridge. Works associated with the horizontal alignment amendments will require a change in Bill powers to alter the limits of deviation as set out in the Bill.

Part 1: Additional land required and a change to Bill powers for the change to the vertical alignment of the HS2 route from the Hatton South cutting to River Lea viaduct

5.3.8 In this location, the Bill provides for the HS2 route within the Hatton South cutting and continuing onto the Stableford South embankment. This section of the route would be within the Stone and Swynnerton area (CA3). See Maps CT-06-227 to CT-06-228a in the main ES Volume 2, CA3 Map Book.

5.3.9 The HS2 route would proceed into the Whitmore Heath to Madeley area, west of Shelton under Harley Farm, and would continue onto the Stableford North embankment into the Meece Brook Valley. The route would continue onto the Meece Brook viaduct, followed by the Meece embankment. The route would then continue into the Whitmore South cutting before passing under the A53 Newcastle Road and into a tunnel under Whitmore Heath. See Maps CT-06-228b to CT-06-230 in the main ES Volume 2, CA4 Map Book.

5.3.10 The HS2 route would then emerge from the Whitmore Heath tunnel and continue through a section of Whitmore Wood within Whitmore North cutting. The route would enter the valley of the River Lea on Lea South embankment and continue onto the River Lea viaduct, passing over the River Lea, the WCML, Stoke to Market Drayton Railway and the Madeley Chord. See Maps CT-06-230 to CT-06-232 in the main ES Volume 2, CA4 Map Book.

²⁰ The design shown on the Bill drawings is a preliminary design. The powers within the Bill must therefore be sufficiently flexible to allow adjustments once detailed design has been carried out. This is achieved by including powers to deviate from the position of the works shown on the Parliamentary plans by a small amount. This deviation is restricted by the limits of deviation marked on the plans.

5.3.11 In the Stone and Swynnerton area the Bill provides for the following:

- Hatton South cutting, 1.3km in length, up to 10m in depth and 72m in width. See Map CT-06-227, E6 to A5, and Map CT-06-228, J6 to F6, in the main ES Volume 2, CA3 Map Book;
- Hatton North cutting, 695m in length, up to 5m in depth and 48m in width, with landscape mitigation planting on both sides of the HS2 route. See Map CT-06-228a, F5 to C5, in the main ES Volume 2, CA3 Map Book;
- closure and realignment of Bent Lane to the southern side of the HS2 route. The realignment would be 350m in length and 100m south-west of its existing alignment, continuing from the Stone and Swynnerton area and passing along the southern side of the route to create Bent Lane (South). The realignment would continue along the southern side of the route for 600m, crossing into the Whitmore Heath to Madeley area (CA4) where the road would be stopped up. See Map CT-06-228a, D7 to A6, in the main ES Volume 2, CA3 Map Book and Map CT-06-229, I6 to H6, in the main ES Volume 2, CA4 Map Book;
- a balancing pond for railway drainage, on the southern side of the HS2 route, 350m west of Dog Lane overbridge. Access would be provided from Bent Lane (South). See Map CT-06-228a, D8 to C7, in the main ES Volume 2, CA3 Map Book; and
- Stableford South embankment, 165m in length and up to 10m in height, with landscape mitigation planting on the northern side of the HS2 route. See Map CT-06-228a, C6 to B6, in the main ES Volume 2, CA3 Map Book.

5.3.12 In the Whitmore Heath to Madeley area the Bill provides for the following:

- diversion of Bent Lane by 700m, to the northern side of the HS2 route, 150m north-east of its existing alignment, continuing from the Stone and Swynnerton area (CA3) along the northern side of the route to create Bent Lane (North). See Map CT-06-229, I5 to F4, in the main ES Volume 2, CA4 Map Book;
- Stableford North embankment, 565m in length and up to 11m in height, with landscape earthworks on both sides of the HS2 route (see Map CT-06-229, I6 to G5, in the main ES Volume 2, CA4 Map Book);
- two balancing ponds for highway drainage, within an area of woodland habitat creation, to the north of the HS2 route, one adjacent to the start of the Stableford North embankment and one adjacent to the Meece Brook viaduct. See Map CT-06-229, I5 and F5, in the main ES Volume 2, CA4 Map Book. Access to both would be from the diverted Bent Lane (North);
- Meece Brook viaduct, 240m in length and up to 12m in height, over Meece Brook. See Map CT-06-229, G5 to E5, in the main ES Volume 2, CA4 Map Book;

- Meece embankment, 260m in length and up to 10m in height, with landscape earthworks on both sides. The embankment would have woodland habitat creation on both sides. See Map CT-06-229, E6 to D5, in the main ES Volume 2, CA4 Map Book;
- a balancing pond for railway drainage, within an area of grassland habitat creation, to the south of the HS2 route, adjacent to the Meece embankment. Access would be provided via an access road 800m in length running north-west to join the A53 Newcastle Road. See Map CT-06-229, E7 to D6, in the main ES Volume 2, CA4 Map Book;
- two landscape bunds, with landscape mitigation planting, 200m north-west of the Meece Brook viaduct, one on the north side of the HS2 route (200m in length and up to 2m in height), and one on the southern side of the route (150m in length and up to 2m in height). See Map CT-06-229, D5 to C5, in the main ES Volume 2, CA4 Map Book;
- Whitmore South cutting, 530m in length, up to 13m in depth and 99m in width See Map CT-06-229, D6 to A5, in the main ES Volume 2, CA4 Map Book;
- a balancing pond for highway drainage, to the north of the HS2 route, 300m east of the A53 Newcastle Road overbridge. Access would be provided from the A53 Newcastle Road See Map CT-06-229, B3, in the main ES Volume 2, CA4 Map Book;
- a tunnel portal building and rescue area at the southern end of the Whitmore Heath tunnel, to the south of the HS2 route. Access would be provided from the A53 Newcastle Road to the north See Map CT- 06-230, I6, in the main ES Volume 2, CA4 Map Book);
- a porous portal 150m in length at the southern end of Whitmore Heath tunnel, with a headwall 69m long and 10m in height at the northern end of the portal cutting. There would be landscape mitigation planting to the north, east and west. See Map CT-06-230, I6 to H5, in the main ES Volume 2, CA4 Map Book;
- A53 Newcastle Road overbridge, 100m in length, 4m above existing ground level and 13m above track level, to carry the A53 Newcastle Road on its existing alignment over the southern porous portal of Whitmore Heath tunnel. The road would be realigned up to 7m above its existing level on embankments on both sides of the overbridge See Map CT-06-230, J3 to H7, in the main ES Volume 2, CA4 Map Book. The A53 Newcastle Road would be temporarily diverted for 900m in length, 150m to the south of its existing alignment during the construction of the cut and cover section and southern porous portal of Whitmore Heath tunnel, and the A53 Newcastle Road overbridge. A temporary roundabout for construction access would be provided. See Map CT-05-230, J2, in the main ES Volume 2, CA4 Map Book;
- a balancing pond for highway drainage, within an area of woodland habitat creation, to the south of the HS2 route, 20m to the north of the A53 Newcastle Road. Access would be provided from the A53 Newcastle Road. See Map CT-06-230, H7 to G7, in the main ES Volume 2, CA4 Map Book;

- a cut and cover section of Whitmore Heath tunnel, 240m in length and up to 17m in depth See Map CT-06-230, H6 to G5, in the main ES Volume 2, CA4 Map Book, continuing into Whitmore Heath twin bore tunnel, 690m in length and up to 50m in depth, passing under Whitmore Heath. The top of the bored tunnel would be up to 40m below existing ground level and track level would be up to 50m below ground level. Both excavated bores would be 10.2m in diameter with a lined internal diameter of 8.8m. There would be cross passages providing access between the two bores. See Map CT-06-230, G6 to C5 in the main ES Volume 2, CA4 Map Book;
- Whitmore Heath (south) tunnelling facility and logistics area to the west of the A53 Newcastle Road, operational for four years and six months. This would provide an area for the storage of bulk materials (aggregates, structural steel, and steel reinforcement) and for transfer of materials associated with the tunnelling works. The TBM for construction of Whitmore Heath twin bore tunnel would be driven from this facility. See Map CT-05-230, H5 to G5, in the main ES Volume 2, CA4 Map Book;
- the temporary diversion of Whitmore Footpath 4 for four years during the construction period. On completion of construction, Whitmore Footpath 4 would be reinstated on its existing alignment. See Map CT-05-230, H4 to G8, in the main ES Volume 2, CA4 Map Book;
- a porous portal 150m in length at the northern end of Whitmore Heath tunnel, with a headwall 94m in length and up to 15m in height at the end of the porous portal cutting. See Map CT-06-230, C5 to C6, in the main ES Volume 2, CA4 Map Book;
- a noise fence barrier, up to 3m in height, at the top of the porous portal cutting along the headwall to the north of the Whitmore Heath tunnel. The barrier would provide acoustic screening for properties in Whitmore Heath to the south of the porous portal. See Map CT-06-230, D6 to D5, in the main ES Volume 2, CA4 Map Book;
- a surface water pumping station for railway drainage, to the south of the HS2 route, 100m north of Whitmore Heath tunnel. Access would be provided from an access road to join Snape Hall Road. See Map CT-06-230, C6, in the main ES Volume 2, CA4 Map Book;
- Whitmore North cutting, 600m in length, up to 13m in depth and 45m in width. See Map CT-06-230, B6 to A6, and Map CT-06-231, J6 to G6, in the main ES Volume 2, CA4 Map Book;
- Whitmore Wood retaining wall, 577m in length and up to 20m in depth below existing ground level with an additional 1.8m parapet extending above existing ground level, running from the north of Snape Hall Road and continuing north- west along the northern side of the HS2 route. See Map CT-06-230, C5 to A5, and Map CT-06-231, J5 to G5, in the main ES Volume 2, CA4 Map Book;

- Whitmore Wood overbridge, 6.8m above existing ground level and 10m above track level, would provide access to Snape Hall Farm and areas of woodland habitat creation and enhancement, 120m north-west of Dab Green drop inlet culvert. See Map CT-06-231, H5 to H6, in the main ES Volume 2, CA4 Map Book;
- Whitmore Wood culvert, 500m north of Snape Hall Farm, to convey an unnamed watercourse under the HS2 route. See Map CT-06-231, G5 to G6, in the main ES Volume 2, CA4 Map Book;
- Lea South embankment, 845m in length and up to 21m in height. There would be landscape earthworks and landscape mitigation planting to both sides of the embankment. A noise fence barrier, up to 4m in height, on the southern side of the HS2 route would extend along the top of the Lea South embankment to the start of the River Lea viaduct. See Map CT-06-231, G6 to C5, in the main ES Volume 2, CA4 Map Book; and
- River Lea viaduct, 785m in length and up to 21m in height. A noise fence barrier, up to 3m in height, would extend along part of the southern side of the River Lea viaduct. See Map CT-06-231, C6 to A5, and Map CT-06-232, J6 to I5, in the main ES Volume 2, CA4 Map Book.

5.3.13 The Select Committee published their Second Report²¹ confirming their in-principle decision that there should be an extension of the southern portal of Whitmore Heath tunnel. This has resulted in changes to the vertical alignment of the HS2 route between the Hatton South cutting and River Lea viaduct to enable the southern porous portal of the Whitmore Heath tunnel to be relocated south-east of the A53 Newcastle Road, to avoid the requirement to temporarily realign the A53 Newcastle Road, and to change the construction method of the Whitmore Heath tunnel from cut and cover and twin bore, to twin bore only.

5.3.14 In the Stone and Swynnerton area the following amendments will be required as part of changing the vertical alignment:

- the northern part of Hatton South cutting will be raised by up to 0.6m, to up to 9.1m in depth. See Map CT-06-227, C6 to A6, to Map CT-06-228a, J5 to F5, in the SES2 and AP2 ES Volume 2, CA3 Map Book; and
- Hatton North cutting will be raised by up to 0.8m, to a depth of up to 4m. The associated earthworks will be reduced slightly in height by 0.3m and width by 1.9m. See Map CT-06-228a, D8 to C7, in the SES2 and AP2 ES Volume 2, CA3 Map Book.

5.3.15 In the Whitmore Heath and Madeley area the following amendments will be required as part of changing the vertical alignment:

- Stableford South embankment will be raised by up to 1.2m, to a height of up to 10.9m. The associated earthworks will be increased in width to the west by

²¹House of Commons (2018). *High Speed Rail (West Midlands - Crewe) Bill Select Committee, Second Special Report of Session 2017-19*. Available online at: <https://publications.parliament.uk/pa/cm201719/cmselect/cmhs2/1452/1452.pdf>

approximately 3m, and the Bent Lane (South) realignment will also be moved slightly west, to allow for the change to the earthworks. See Map-CT-06-229, J6 to H6, in the SES2 and AP2 ES Volume 2, CA4 Map Book;

- the southern part of Stableford North embankment will be raised by up to 0.7m, to a maximum height of 8.8m. The associated earthworks will be increased slightly by 0.7m in height and 4.8m in width, and the corresponding woodland habitat creation will be increased slightly by 600m². See Map CT-06-229, H6 to G6, in the SES2 and AP2 ES Volume 2, CA4 Map Book;
- the northern part of Stableford North embankment will be lowered by up to 0.9m, to a maximum height of 10.2m. The associated landscape earthworks will be reduced by 0.8ha. See Map CT-06-229, G6 to F6, in the SES2 and AP2 ES Volume 2, CA4 Map Book;
- a new balancing pond for railway drainage, will be located on the northern side of the HS2 route, adjacent to Stableford North embankment and within an area of woodland habitat creation. The area of the woodland habitat creation will be reduced by 0.8ha to allow for the balancing pond. See Map CT-06-229, G5 to F5, in the SES2 and AP2 ES Volume 2, CA4 Map Book;
- Meece Brook viaduct will be lowered by up to 2.2m, to a height of up to 10.1m. See Map CT-06-229, F6 to E6, in the SES2 and AP2 ES Volume 2, CA4 Map Book;
- Meece embankment will be lowered by up to 3.3m, to a height of up to 8.6m. The associated landscape earthworks will be reduced by 0.6ha. See Map CT-06-229, E6 to D6, in the SES2 and AP2 ES Volume 2, CA4 Map Book;
- Whitmore South cutting will be lowered by up to 5.5m, to a depth of up to 17.2m, to allow the southern porous portal of Whitmore Heath tunnel to be relocated south-east along the HS2 route by approximately 180m. As a result, Whitmore South cutting will be reduced in length from 530m to 410m. The routing of a telecommunications cable and water mains to the tunnel portal building and the position of the associated landscape bunds and woodland habitat creation will be adjusted to suit the new arrangement. See Map CT-06-229, D6 to A6, in the SES2 and AP2 ES Volume 2, CA4 Map Book;
- a surface water pumping station for railway drainage, to the south of the HS2 route adjacent to Whitmore Heath tunnel north portal, will be relocated to the south of the HS2 route adjacent to Whitmore Heath tunnel south portal. Access will be provided via an access road from the A53 Newcastle Road. See Map CT-06-229, B6, in the SES2 and AP2 ES Volume 2, CA4 Map Book;
- the temporary realignment of the A53 Newcastle Road and the A53 Newcastle Road overbridge, located adjacent to Whitmore South cutting on both sides of the HS2 route, are no longer required. See Map CT-05-229, B3 to A7, and Map CT-05-230, J2 to H8, in the SES2 and AP2 ES Volume 2, CA4 Map Book. Two associated balancing ponds for highway drainage and associated mitigation planting will also be removed. Landscape mitigation planting on

the northern side of the route, at the northern most extent of Whitmore Heath tunnel south portal, will be relocated south of the A53 Newcastle Road adjacent to the relocated southern porous portal. See Map CT-06-230, H7 to H5, in the SES2 and AP2 ES Volume 2, CA4 Map Book;

- the cut and cover section of Whitmore Heath tunnel will be replaced by extending the twin bore tunnel for the full extent between the two porous portals. In total the length of the tunnel will increase by 180m to 1.4km (including the porous portals) See Map CT-06-230, I5 to C5, in the SES2 and AP2 ES Volume 2, CA4 Map Book;
- the vertical alignment of the twin bore section of Whitmore Heath tunnel will be lowered by up to 7m. See Map CT-06-230, J5 to C5 in the SES2 and AP2 ES Volume 2, CA4 Map Book;
- the temporary diversion of Whitmore Footpath 4, north of the A53 Newcastle Road, is no longer required and will be removed. See Map CT-05-229, B3 to A7, and Map CT-05-230, I4 to G8, in the SES2 and AP2 ES Volume 2, CA4 Map Book;
- the vertical alignment within Whitmore North cutting will be increased by up to 3m, to allow for the lowering of the vertical alignment through Whitmore Heath tunnel. As a result, Whitmore Wood retaining wall will be split into two sections either side of the Dab Green culvert, a southern section 368m in length with a depth of up to 14.9m and a northern section 142m in length with a depth of up to 6.4m. Both sections will have a parapet, 1.8m above existing ground level. See Map CT-06-231, J5 to G5, in the SES2 and AP2 ES Volume 2, CA4 Map Book;
- Whitmore Wood overbridge will be replaced with Whitmore Wood underbridge, 350m to the north-west of the position of Whitmore Wood overbridge. The associated earthworks that would have been within the woodland will no longer be required. A new length of accommodation access track, on the northern side of the HS2 route, will be required to connect Whitmore Wood underbridge to the existing track through Whitmore Wood. See Map CT-06-231, H6 to F6, in the SES2 and AP2 ES Volume 2, CA4 Map Book;
- the vertical alignment of the southern part of Lea South embankment will be raised by up to 3m, to a height of up to 12.7m. The position of the associated landscape earthworks and woodland habitat creation will be adjusted slightly by 10m to the south and west to fit the new arrangement. See Map CT-06-231, C6 to C5, in the SES2 and AP2 ES Volume 2, CA4 Map Book;
- the vertical alignment of the northern part of Lea South embankment will be lowered by up to 0.8m, to a height of up to 19.2m. The position of the associated landscape earthworks and woodland habitat creation will be adjusted slightly by 10m to the south and west to suit the new arrangement. See Map CT-06-231, C6 to C5, in the SES2 and AP2 ES Volume 2, CA4 Map Book; and

- the vertical alignment of the southern part of the River Lea viaduct will be lowered by up to 0.8m until the point where it ties in with the HS2 route included in the original scheme. See Map CT-06-231, C6 to C5, in the SES2 and AP2 ES Volume 2, CA4 Map Book.

- 5.3.16 The relocation of the southern porous portal of Whitmore Heath tunnel and the lengthening of the section of bored tunnel will require changes to the location of construction compounds, a logistics area, transfer nodes and temporary material stockpiles in this area. Whitmore Heath tunnel satellite compound, Whitmore Heath (south) tunnelling facility and logistics area and Whitmore Heath tunnel south portal satellite compound, transfer nodes and stockpiles will all be relocated and will predominantly occupy the area to the south of the A53 Newcastle Road and the south-west of the HS2 route, between the southern porous portal and the WCML. A transfer node and material stockpile, north of the A53 Newcastle Road, will remain in the location included in the original scheme. See Map CT-05-229, D7 to A4, and Map CT-05-230, J9 to H4, in the SES2 and AP2 ES Volume 2, CA4 Map Book.
- 5.3.17 The increase in length of the bored tunnel will require a new area to be provided for the storage of materials used for the bored tunnel. The Whitmore Heath Tunnel materials storage area will be located 100m west of the southern porous portal of Whitmore Heath tunnel, within land required for the original scheme. See Map CT-05-229, C4 to B4 in the SES2 and AP2 ES Volume 2, CA4 Map Book.
- 5.3.18 The activities described in this part of the amendment will be constructed over a period of five years and nine months commencing in 2020. Works will be managed from Hatton South cutting satellite compound and Hatton North cutting satellite compound in the Stone and Swynnerton area, and Stableford North embankment satellite compound, Whitmore Heath tunnel satellite compound, Whitmore Heath tunnel south portal satellite compound, Whitmore Heath tunnel north portal satellite compound, Whitmore North cutting satellite compound, and River Lea viaduct satellite compound in the Whitmore Heath to Madeley area.
- 5.3.19 The changes to the Whitmore Wood overbridge are outside the limits of the Bill and will require a change to Bill powers. The amendment to construct the twin-bore section and relocate the southern porous portal of Whitmore Heath tunnel is outside the limits of the Bill and will result in the requirement for approximately 15ha of additional land. See Map CT-06-231, C6 to C5, and Map CT-05-229 D9 to A8 in the SES2 and AP2 ES Volume 2, CA4 Map Book. It is assumed that all of the additional land will be returned to its existing use following construction.

Part 2: Additional land required and a change to Bill powers for change to the horizontal alignment of the HS2 route from the southern extent of Stableford North embankment to Madeley Bridleway 1 accommodation green overbridge

- 5.3.20 In this location, the Bill provides for the HS2 route on the Meece Brook viaduct and would continue onto the Meece embankment. The route would proceed into the Whitmore South cutting before passing under the A53 Newcastle Road and into a tunnel under Whitmore Heath. See Map CT-06-229 and Map CT-06-230 in the main ES Volume 2, CA4 Map Book.

- 5.3.21 The HS2 route would then emerge from the Whitmore Heath tunnel and continue through a section of Whitmore Wood within Whitmore North cutting. The route would enter the valley of the River Lea on Lea South embankment and continue onto the River Lea viaduct, passing over the River Lea, the WCML, Stoke to Market Drayton Railway and the Madeley Chord. The route would then continue on Lea North embankment and pass under Manor Road overbridge. See Maps CT-06-230 to CT-06-232 in the main ES Volume 2, CA4 Map Book.
- 5.3.22 The HS2 route would continue into Madeley cutting, passing under the A525 Bar Hill overbridge, before entering the Madeley tunnel, to the west of Madeley. See Map CT-06-232 and Map CT-06-233 in the main ES Volume 2, CA4 Map Book.
- 5.3.23 The Bill provides for the following (in this section there are design features common with those reported under Part 1, where this is the case, they are not repeated):
- a tunnel portal building and rescue area at the northern end of Whitmore Heath tunnel to the southern side of the HS2 route. Access would be provided by an access road from Snape Hall Road, 150m to the west. See Map CT-06-230, C6 to B6, in the main ES Volume 2, CA4 Map Book;
 - an area of woodland restoration, including the restoration of an area of plantation within the boundary of Whitmore Wood to the north and south of Whitmore North cutting. See Map CT-06-231, J6 to G4, in the main ES Volume 2, CA4 Map Book;
 - a balancing pond for railway drainage, within an area of landscape mitigation planting, to the south of the HS2 route adjacent to Whitmore Heath tunnel northern tunnel portal building and rescue area. Access would be provided from an access road, 100m in length, running south to Snape Hall Road. See Map CT-06-231, J6, in the main ES Volume 2, CA4 Map Book;
 - Dab Green drop inlet culvert, 350m north of Snape Hall Road as the HS2 route passes through Whitmore Wood, for surface water drainage under the route. See Map CT-06-231, H5 to H6, in the main ES Volume 2, CA4 Map Book;
 - Whitmore Footpath 6 would be realigned in two places and diverted in another along the south of the HS2 route. See Map CT-06-231, H7 to C5, in the main ES Volume 2, CA4 Map Book;
 - Whitmore North auto-transformer station, 58m by 25m, to the south of the HS2 route adjacent to the Lea South embankment. Access would be via an access road from Snape Hall Road, 900m to the south-east. See Map CT-06-231, F6 to E6, in the main ES Volume 2, CA4 Map Book;
 - access for maintenance and accommodation access to farmland associated with Snape Hall Farm, on the northern side of the HS2 route, would be provided by the diverted Madeley Footpath 14. See Map CT-06-231, C5 to C6, in the main ES Volume 2, CA4 Map Book;
 - a replacement floodplain storage area on the southern side of the HS2 route in the Lea Valley, adjacent to the River Lea viaduct. Following excavation,

the area would be re-graded to tie into existing ground level. See Map CT-06-232, H9 to G7, in the main ES Volume 2, CA4 Map Book;

- the Lea North embankment, 860m in length and up to 16m in height, extending from the River Lea viaduct to Manor Road, with landscape mitigation planting and landscape earthworks on both sides. See Map CT-06-232, G6 to C5, in the main ES Volume 2, CA4 Map Book;
- River Lea flood culvert, 230m north-west of the River Lea viaduct, to provide flood relief. There would be associated flood relief channels which would extend for 260m along the northern side and 500m along southern side of the HS2 route. See Map CT-06-232, H6 to E5, in the main ES Volume 2, CA4 Map Book;
- realignment of Manor Road, 100m to the north-west of its existing alignment, on an embankment 1km long and up to 13m in height. The realigned Manor Road would cross over the HS2 route on Manor Road overbridge, up to 14m above existing ground level and 10m above track level. A separate accommodation access for Manor Farm over the Manor Road overbridge would be provided, to the north of the road, connecting the fields to the north and south of the route. The existing Manor Road would be stopped up where it crosses the route and retained as public highway with access provided on both sides of the route for fields associated with Manor Farm to the south and for Madeley Cemetery and Hey House to the north. See Map CT-06-232, E8 to B3, in the main ES Volume 2, CA4 Map Book;
- Madeley cutting, approximately 1km in length, up to 17m in depth and 133m in width. See Map CT-06-233, B6 to A5, and Map CT-06-234, J6 to E5, in the main ES Volume 2, CA4 Map Book. Noise fence barriers up to 3m in height would be located on the northern side of the cutting, extending from the Madeley Bridleway 1 accommodation green overbridge across the A525 Bar Hill Road to the southern porous portal of Madeley tunnel portal buildings and rescue area. There would be landscape mitigation planting along both sides. See Map CT-06-233, H5 to E5, in the main ES Volume 2, CA4 Map Book; and
- a landscape bund with woodland habitat creation, 300m in length and 2m in height, to the north of the HS2 route, extending from the start of Madeley cutting to the Madeley Bridleway 1 accommodation green overbridge. See Map CT-06-233, I5 to H5, in the main ES Volume 2, CA4 Map Book.

5.3.24 The Select Committee published their Second Report²² confirming their in-principle decision that there should be an extension of the southern porous portal of Whitmore Heath tunnel. This has identified an opportunity to change the horizontal alignment of the HS2 route and to amend the separation distance between the two HS2 tracks, between the Stableford North embankment and Madeley Bridleway 1

²² House of Commons (2018). *High Speed Rail (West Midlands - Crewe) Bill Select Committee, Second Special Report of Session 2017-19*. Available online at: <https://publications.parliament.uk/pa/cm201719/cmselect/cmhs2/1452/1452.pdf>

accommodation overbridge. The changes in horizontal alignment and separation distance enable the footprint of the route through Whitmore Wood to be reduced.

5.3.25 The following amendments will be required as part of changing the horizontal alignment:

- the track separation through Whitmore South cutting will be increased by up to 11m, to a total of 29m. The associated earthworks will be amended and two associated landscape earthworks to the north and south of Whitmore South cutting will be repositioned to accommodate the revised earthworks. See Map CT-06-229, D5 to B5, in SES2 and AP2 ES Volume 2, CA4 Map Book;
- the spacing between the twin bores of the Whitmore Heath tunnel will be increased by up to 11m, to allow for changes in the horizontal alignment. The associated cross passages in the tunnel will be relocated See Map CT-06-230, I5 to D6, in the SES2 and AP2 ES Volume 2, CA4 Map Book;
- the northern porous portal of Whitmore Heath tunnel will be relocated by approximately 10m to the south-west. The rescue area, tunnel portal building and access will be realigned to maintain access included in the original scheme. The power supply for the tunnel portal building will be re-routed to suit its new location. Landscape mitigation planting on the southern side of the HS2 route, at the southern-most extent of the northern portal, will be re-orientated and will be reduced in size by approximately 0.9ha to accommodate the revised portal location. See Map CT-06-230, D5 to B6, in the SES2 and AP2 ES Volume 2, CA4 Map Book;
- the balancing pond for railway drainage on the southern side of the HS2 route, at the northern-most extent of the northern portal, will be increased in size to accommodate the increase in track area draining to this pond. See Map CT-06-230, C6 to B6, in the SES2 and AP2 ES Volume 2, CA4 Map Book;
- the horizontal alignment of Whitmore Wood retaining wall and Whitmore North cutting will be moved to the south-west by 10m. The track separation distance will be reduced by up to 10m, to 16m at the southern end of Whitmore North cutting and 8m at the northern end of Whitmore North cutting, to allow for a reduction in the footprint of the HS2 route through Whitmore Wood ancient woodland. See Map CT-06-230, C5 to A5 and Map CT-06-231, J5 to H5, in the SES2 and AP2 ES Volume 2, CA4 Map Book;
- the horizontal alignment through Lea South embankment will be relocated to the south-west by 10m. The track separation distance continues to reduce from 8.2m until it reaches 5m mid-way along the Lea South embankment. The earthworks and temporary stockpiles associated with Lea South embankment will be reconfigured and an additional 100m² of landscape mitigation planting will be provided on the southern side of the HS2 route. See Map CT-06-231, G5 to C5, in the SES2 and AP2 ES Volume 2, CA4 Map Book;
- Whitmore North auto-transformer station and the adjacent maintenance and accommodation access track, will be relocated to accommodate the revised

position of Lea South embankment. There will be minor changes to Whitmore Footpath 6 diversion and Madeley Footpath 14 diversion adjacent to Whitmore North cutting and Lea South embankment, to accommodate the revised position of the cutting and embankment. See Map CT-06-231, F6 to C5, in the SES2 and AP2 ES Volume 2, CA4 Map Book;

- the horizontal alignment through River Lea viaduct will be moved to the south-west by up to 10m. The track separation between Lea South embankment and mid-way along the River Lea viaduct will be reduced from 18m to 5m, to allow for the viaduct structure to be amended from two separate decks to a single deck supporting both HS2 tracks. An additional 1.3ha of grassland habitat creation will be provided on the southern side of the HS2 route. See Map CT-06-231, C5 to A5, and Map CT-06-232, J5 to G5, in the SES2 and AP2 ES Volume 2, CA4 Map Book;
- the horizontal alignment through Lea South embankment will be moved to the south-west by up to 9.4m. The earthworks and temporary stockpiles associated with Lea North embankment will be reconfigured and an additional 1.3ha of landscape mitigation planting will be provided on the southern side of the HS2 route. The River Lea flood culvert, River Lea flood relief channels and the replacement floodplain storage area are no longer required. There will be no increase in flood extent. See Map CT-06-232, H9 to E5, in the SES2 and AP2 ES Volume 2, CA4 Map Book;
- the vertical alignment of Manor Road overbridge will be increased by up to 1m to accommodate the changes in horizontal alignment and track separation. The associated highway earthworks will increase in width by up to 5m as a result. See Map CT-06-232, D7 to B3, in the SES2 and AP2 ES Volume 2, CA4 Map Book; and
- the landscape earthworks and landscape mitigation planting on the northern side of Madeley cutting, between Manor Road overbridge and Madeley Bridleway 1 accommodation green overbridge, will be reconfigured to accommodate a slight move in the horizontal alignment to the south-west, varying between 0.1m at Manor Road overbridge and 9.7m at Madeley Bridleway 1 accommodation green overbridge. See Map CT-06-232, J5 to H5, in the SES2 and AP2 ES Volume 2, CA4 Map Book.

5.3.26 The activities described in this part of the amendment will be constructed over a period of five years and nine months commencing in 2020. Works will be managed from Stableford North embankment satellite compound, Whitmore Heath tunnel satellite compound, Whitmore Heath tunnel south portal satellite compound, Whitmore Heath tunnel north portal satellite compound, Whitmore North cutting satellite compound, and River Lea viaduct satellite compound and Madeley cutting satellite compound.

5.3.27 The changes to the horizontal alignment of the Whitmore Heath tunnel northern porous portal, Whitmore North cutting, and Lea South embankment are outside the limits of the Bill and will require a change to Bill powers. The changes to the vertical alignment of Manor Road overbridge are outside the limits of the Bill and will result in

a requirement for 0.2ha of additional land. See Map CT-05-229, C10 to A8 and Map CT 05-230, J9 to I7 in the SES and AP ES Volume 2, CA4 Map Book. It is assumed that all of the additional land will be maintained permanently following construction.

Local alternatives

- 5.3.28 Since submission of the Bill, at the direction of Select Committee, further consideration has been given to the HS2 route in the Whitmore Heath to Madeley area. The sensitivity of this location, particularly the impacts on the A53 Newcastle Road, Meece Brook and the impact of the HS2 route through Whitmore Wood ancient woodland have been key considerations in the development of these alternatives.
- 5.3.29 It was identified that lowering the vertical alignment would allow the southern porous portal of the Whitmore Heath tunnel to be moved south along the HS2 route, which would avoid the need for the A53 Newcastle Road to be temporarily realigned, and would also allow the height of the Meece Brook viaduct crossing to be reduced. Whilst developing the changes to the vertical alignment, an opportunity to amend the horizontal alignment was identified which would reduce the permanent footprint of the HS2 route through Whitmore Wood and would reduce costs and use of materials.
- 5.3.30 Four options were considered for this amendment as follows:
- Option W1: the vertical alignment of the HS2 route would be lowered by up to 8.4m between Hatton North cutting and Whitmore North cutting to allow the southern porous portal of Whitmore Heath tunnel to be relocated to the southern side of the A53 Newcastle Road. Minor changes to the vertical alignment would be required in other sections of the HS2 route, to maintain geometrical standards on the railway. This would include raising the vertical alignment through Whitmore Wood by up to 3m. The horizontal alignment of the down line would be moved to the south-west by 10m between Whitmore South cutting and the River Lea viaduct. The horizontal alignment of the up line would be moved to the south-west by between 10m to 23m between Whitmore South cutting and Lea North embankment. This horizontal shift to each track means that the track separation distance would reduce from 18m to 6m through the north end of Whitmore Wood, from 18m to 14.9m through the south end of Whitmore Wood, and from 18m to 5m over the crossing of the WCML. The cut and cover section of the Whitmore Heath tunnel would be removed, and the length of the bored section of the tunnel would increase by 290m to approximately 1.2km (excluding the porous portals);
 - Option W2 (AP2 revised scheme): the vertical alignment of the HS2 route would be lowered by up to 7m between Stableford North embankment and the southern porous portal of Whitmore Heath tunnel, to allow the southern porous portal to be relocated to the southern side of the A53 Newcastle Road. Minor changes to the vertical alignment would be required in other sections of the HS2 route to maintain geometrical standards on the railway. This would include raising the vertical alignment of the route through Whitmore Wood by up to 3m. The horizontal alignment of the down line would be moved to the south-west by 10m between Whitmore South cutting and River Lea viaduct. The horizontal alignment of the up line would be moved to the south-west by between 10m to 23m between Whitmore Heath tunnel and Lea North

embankment. This horizontal shift to each track means that the track separation distance would reduce from 18m to 6.9m through the north end of Whitmore Wood, from 18m to 14.7m through the south end of Whitmore Wood, and from 18m to 5m over the crossing of the WCML. The cut and cover section of the Whitmore Heath tunnel would be removed, and the length of the bored section of the tunnel would increase by 149m to approximately 1.1km (excluding the porous portals);

- Option W3: the vertical alignment of the HS2 route would be lowered by up to 9.8 metres between Stableford North embankment and Whitmore North cutting to allow the southern porous portal of Whitmore Heath tunnel to be relocated to the southern side of the A53 Newcastle Road. Minor changes to the vertical alignment would be required in other sections of the HS2 route to maintain geometrical standards on the railway. This would include raising the vertical alignment through Whitmore Wood by up to 3m. The horizontal alignment of the up line would be moved to the south-west by 13m between Whitmore North cutting and Lea North embankment. This horizontal shift means that the track separation distance would reduce from 18m to 5m through the north end of Whitmore Wood, from 18m to 10.7m through the south end of Whitmore Wood, and from 18m to 5m over the crossing of the WCML. There would be no change to the horizontal alignment of the down line. The cut and cover section of the Whitmore Heath tunnel would be removed, and the length of the bored section of the tunnel would increase by 374m to approximately 1.3km (excluding the porous portals); and
- Option W4: the vertical alignment of the HS2 route would be lowered by up to 9m between Stableford North embankment and Whitmore North cutting to allow the southern porous portal of Whitmore Heath tunnel to be relocated to the southern side of the A53 Newcastle Road. Minor changes to the vertical alignment would be required in other sections of the HS2 route to maintain geometrical standards on the railway. This would include raising the vertical alignment through Whitmore Wood by up to 3.2m. The horizontal alignment of the up line would be moved to the south-west by 13m between Lea South embankment and River Lea viaduct. This horizontal shift means that the track separation distance would reduce from 18m to 7.1m through the north end of Whitmore Wood, from 18m to 16.3m through the south end of Whitmore Wood, and from 18m to 5m over the crossing of the WCML. There would be no change to the horizontal alignment of the down line. The cut and cover section of the Whitmore Heath tunnel would be removed, and the length of the bored section of the tunnel would increase by 355m to approximately 1.3km (excluding the porous portals).

5.3.31 Option W2 was identified as the preferred option, as on balance it would reduce construction complexity, reduce costs and reduce environmental impacts when compared to the original scheme. Whilst Option W1, Option W3 and Option W4 would also result in reduced construction, reduced complexity and similar environmental impacts, these options offered smaller cost savings than Option W2 due to track alignments that would cost slightly more to construct, and additional costs associated with the associated changes to the railway systems design.

5.3.32 The analysis of engineering, cost and potential environmental impacts associated with the options is set out below, with the impacts of the preferred option presented first.

Option W2 (AP2 revised scheme)

5.3.33 Option W2 introduces some environmental benefits as well as a simpler engineering solution compared to the original scheme. There would be a lowering of embankments, a change to the structure of the Meece Brook viaduct, and removal of the A53 Newcastle Road overbridge and the section of cut and cover tunnel (which will be replaced by bored tunnel). The changes to the alignment reduce the earthworks associated with embankments and cuttings. The focus of construction activity in the vicinity of Whitmore Heath would be relocated south of the A53 Newcastle Road, further away from residential properties in Whitmore Heath. The reduction in width of Whitmore North cutting and height of Whitmore Wood retaining wall would reduce the loss of ancient woodland from Whitmore Wood.

5.3.34 There is likely to be an overall improvement in effects on visual receptors and landscape character during construction compared to the original scheme due to a reduction in construction activities and the retention of hedgerows and woodland.

5.3.35 During construction this option would reduce impacts on users of both the A53 Newcastle Road and Whitmore Footpath 4.

5.3.36 The lowering and extension of the bored tunnel would be within a source protection zone for public water abstraction near Whitmore.

5.3.37 Option W2 does not introduce any significant technical or construction complexities, risk of safety hazards or lengthening of the construction programme. With Option W2 there would be a reduction in cost when compared against the original scheme.

Option W1

5.3.38 The cost savings as a result of simpler construction compared to the original scheme would be less than Option W2, due to the longer tunnel, smaller reduction of earthworks and smaller reduction in height of Whitmore Wood retaining wall.

5.3.39 Option W1 would require changes to the rail system design affecting the provision of auto-transformer stations, due to steeper gradients and longer tunnel than the original scheme. The estimated costs of redesigning the traction power system would be higher than Option W2 and would outweigh the savings made as a result of reduced earthworks and simpler construction.

5.3.40 Overall, Option W1 would cost more than the original scheme, and more than Option W2.

Option W3

5.3.41 The cost savings as a result of simpler construction compared to the original scheme would be less than Option W2, due to the longer tunnel, smaller reduction of earthworks and smaller reduction in height of Whitmore Wood retaining wall.

5.3.42 Option W3 would require changes to the rail system design affecting the provision of auto-transformer stations, due to steeper gradients and longer tunnel than the original scheme. The estimated costs of redesigning the traction power system would

be higher than Option W2 and would outweigh the savings made as a result of reduced earthworks and simpler construction.

- 5.3.43 Overall, Option W3 would cost more than the original scheme, and more than Option W2.

Option W4

- 5.3.44 The cost savings as a result of simpler construction compared to the original scheme would be less than Option W2, due to the longer tunnel, smaller reduction of earthworks and smaller reduction in height of Whitmore Wood retaining wall.

- 5.3.45 Option W4 would require changes to the rail system design affecting the provision of auto-transformer stations, due to steeper gradients and longer tunnel. The estimated costs of redesigning the traction power system were higher than Option W2 and would outweigh the savings made as a result of reduced earthworks and simpler construction.

- 5.3.46 Overall, Option W3 would cost more than the original scheme, and more than Option W2.

Topics included in the AP2 assessment

- 5.3.47 This amendment is considered to require reassessment of the environmental effects and mitigation in the main ES, as amended by SES1 and SES2, for the following topics: agriculture and soils; air quality; community; cultural heritage; ecology and biodiversity; landscape and visual; sound, noise and vibration; traffic and transport; and water resources and flood risk.

- 5.3.48 The assessment of the changes to construction traffic flows and traffic related effects as a result of this AP2 amendment in combination with all SES2 changes and AP2 amendments, is reported in Section 7.

Agriculture, forestry and soils

Scope, assumptions and limitations

- 5.3.49 The assessment scope, key assumptions and limitations for agriculture, forestry and soils are as set out in Volume 1, the Scope and Methodology Report (SMR)²³ and the SMR Addendum²⁴ of the main ES.

- 5.3.50 This amendment has the potential to result in new or different significant construction effects only. Therefore, there is no operational assessment for agriculture, forestry and soils.

²³ HS2 Ltd (2017). *High Speed Rail (West Midlands - Crewe) Environmental Statement*, Volume 5: Technical appendices, Environmental Impact Assessment Scope and Methodology Report (Appendix CT-001-001). Available online at: <https://www.gov.uk/government/publications/scope-and-methodology-report-for-hs2-phase-2a>

²⁴ HS2 Ltd (2017). *High Speed Rail (West Midlands - Crewe) Environmental Statement*, Volume 5: Technical appendices, Environmental Impact Assessment Scope and Methodology Report Addendum (Appendix CT-001-002). Available online at: <https://www.gov.uk/government/publications/scope-and-methodology-report-for-hs2-phase-2a>

Existing environmental baseline

- 5.3.51 The baseline agriculture, forestry and soils information for the Whitmore Heath to Madeley area is as described in Volume 2, CA4, Section 4 of the main ES.
- 5.3.52 The area of land required for the amendment has soil predominantly in the Bridgnorth association, as described in Volume 2, CA4, Section 4 of the main ES. Bridgnorth association comprises of well drained sandy and coarse loamy soils over soft sandstone. This land is classified as very good quality in Grade 2²⁵.
- 5.3.53 Three farm holdings, already affected by the original scheme, will be further affected by the amendment. These are:
- Whitmore Hall Farm (CA4/1), a 365ha dairy farm with a large number of diversified activities of high sensitivity to change;
 - Baldwin's Gate Farm (CA4/2), a 254ha dairy farm of medium sensitivity to change; and
 - Rose Cottage (CA4/3), a 1ha grassland parcel of low sensitivity to change.

Future environmental baseline

Construction (2020)

- 5.3.54 The future baseline for construction in 2020 remains unchanged from that reported in the main ES Volume 5: Appendix CT-004-000.

Effects arising during construction

Avoidance and mitigation measures

- 5.3.55 No avoidance or mitigation measures, additional to those reported in the main ES and draft Code of Construction Practice (CoCP)²⁶, are required.

Assessment of impacts and effects

- 5.3.56 The amendment will not give rise to a new or different significant effect and will not change the level of significance of the effects reported in the main ES on best and most versatile (BMV) agricultural land or forestry land within the Whitmore Heath to Madeley area as it is not of a scale to change the magnitude of impact. The route-wide effects on BMV land and forestry land are reported in Volume 3 of the SES2 and AP2 ES.
- 5.3.57 The main ES reported a temporary major adverse significant effect on Whitmore Hall Farm (CA4/1). Approximately 85.3ha (23% of the total area of the land holding) would be required temporarily, resulting in a high impact. The amendment will require an additional 14.7ha but also remove the requirement for 3.2ha, leading to a net

²⁵ The quality of agricultural land in England and Wales is assessed according to the Agricultural Land Classification (ALC) system, which classifies agricultural land into five grades from excellent quality Grade 1 land to very poor quality Grade 5 land. Grade 3 is subdivided into Subgrades 3a and 3b. Grades 1, 2 and 3a are defined as the best and most versatile (BMV) land. The ALC methodology is contained in: Ministry of Agriculture, Fisheries and Food (1988). *Agricultural Land Classification of England and Wales – Revised guidelines and criteria for grading the quality of agricultural land*. Available online at: <http://publications.naturalengland.org.uk/publication/6257050620264448>

²⁶ HS2 Ltd (2017). *High Speed Rail (West Midlands - Crewe) Environmental Statement*, Volume 5: Technical appendices, draft Code of Construction Practice (CT-003-000). Available online at <https://www.gov.uk/government/publications/draft-code-of-construction-practice-for-hs2-phase-2a>

additional 11.5ha of land required temporarily from the land holding, and resulting in a total area required temporarily of 96.8ha (27% of the total area of the land holding). The amendment will not give rise to a new or different significant effect and will not change the level of significance of the effects reported in the main ES.

- 5.3.58 The main ES reported a permanent major/moderate adverse significant effect on Whitmore Hall Farm. Approximately 66.6ha (18% of the total area of the land holding) would be required permanently, resulting in a medium impact. The amendment will reduce the land required permanently from the land holding by 1ha, resulting in a total area required permanently of 65.6ha (18% of the total area of the land holding). The amendment will not give rise to a new or different significant effect and will not change the level of significance of the effects reported in the main ES.
- 5.3.59 The main ES reported a negligible temporary effect on Baldwin's Gate Farm (CA4/2), which is not significant. Approximately 7ha (3% of the total area of the land holding) would be required temporarily, which is a negligible impact. The amendment will reduce the land required temporarily from the land holding by 2ha, resulting in a total area required temporarily of 5ha (2% of the total area of the land holding). The amendment will not give rise to a new or different significant effect and will not change the level of the effect reported in the main ES.
- 5.3.60 The main ES reported a negligible permanent effect on Baldwin's Gate Farm, which is not significant. Approximately 3.6ha (1% of the total area of the land holding) would be required permanently, which is a negligible impact. The amendment will remove all the land required permanently from the land holding.
- 5.3.61 The main ES reported a moderate adverse temporary and permanent significant effect on Rose Cottage (CA4/3). Approximately 1ha (100% of the total area of the land holding) would be required temporarily and permanently, which is a high impact. The amendment will remove all of the land required temporarily and permanently from the land holding and will, therefore, remove the temporary and permanent moderate adverse significant effect reported in the main ES.
- 5.3.62 For further information see SES2 and AP2 ES Volume 5: Appendix AG-001-000 and SES2 and AP2 ES Volume 5: Agriculture, forestry and soils Map Book.

Mitigation and residual effects

Other mitigation measures

- 5.3.63 The land required temporarily for construction will be restored to its former agricultural condition once the works are completed, following good practice techniques in handling, storing and reinstating soils on that land, as reported in the main ES and draft CoCP. No other mitigation has been identified.

Summary of likely residual significant effects

- 5.3.64 The amendment will remove the likely residual significant temporary and permanent moderate adverse effect on Rose Cottage (CA4/3), reported in the main ES, as land is no longer required temporarily or permanently from the land holding.

Cumulative effects

- 5.3.65 There are no new or different likely significant cumulative effects for agriculture, forestry and soil as a result of the amendment acting in combination with any other AP2 amendments.

Air quality

Scope, assumptions and limitations

- 5.3.66 The assessment scope, key assumptions and limitations for air quality are as set out in Volume 1, the SMR and SMR Addendum of the main ES.
- 5.3.67 This amendment has the potential to result in new or different significant construction effects only. Therefore, there is no operational assessment for air quality. This section only considers effects from construction dust. Any air quality effects from construction traffic are reported in Section 7.

Existing environmental baseline

- 5.3.68 The baseline air quality information for the Whitmore Heath to Madeley area is as described in Volume 2, CA4, Section 5 of the main ES. The updated background pollutant concentrations from the Department for Environment, Food and Rural Affairs (Defra) have only minor changes compared to the information used in the main ES.

Future environmental baseline

Construction (2020)

- 5.3.69 The future committed development baseline for construction in 2020 remains unchanged from that reported in the main ES Volume 5: Appendix CT-004-000.
- 5.3.70 The updated background pollutant concentrations for 2020 from Defra have only minor changes compared to the information used in the main ES.

Effects arising during construction

Avoidance and mitigation measures

- 5.3.71 No avoidance or mitigation measures, additional to those reported in the main ES and draft CoCP, are identified.

Assessment of impacts and effects

- 5.3.72 The main ES reported no significant effects on air quality from dust generating activities in this area. With the application of the mitigation measures, as set out in the draft CoCP, no significant effects are anticipated from dust generating activities associated with this amendment. Therefore, this amendment will not give rise to any new or different likely residual significant effects and will not change the level of significance of the effects reported in the main ES. For further information see SES2 and AP2 ES Volume 5: Appendix AQ-001-004.

Cumulative effects

- 5.3.73 There are no new or different likely significant cumulative effects for air quality as a result of the amendment acting in combination with any other AP2 amendments.

Community

Scope, assumptions and limitations

- 5.3.74 The assessment scope, key assumptions and limitations for community are as set out in Volume 1, the SMR and SMR Addendum of the main ES.
- 5.3.75 This amendment has the potential to result in new or different significant temporary construction and operational effects only for community. Therefore, there is no assessment of permanent construction effects for community.

Existing environmental baseline

- 5.3.76 The baseline community information for the Whitmore Heath to Madeley area is as described in Volume 2, CA4, Section 6 of the main ES.
- 5.3.77 The area is predominantly rural, made up of a few small settlements with limited community facilities. Whitmore Heath is a small settlement to the west of Whitmore and comprises of approximately 56 residential properties.

Future environmental baseline

Construction (2020) and operation (2027)

- 5.3.78 The future baseline for construction in 2020 and operation in 2027 remains unchanged from that reported in the main ES Volume 5: Appendix CT-004-000.

Effects arising during construction

Avoidance and mitigation measures

- 5.3.79 No avoidance or mitigation measures, additional to those reported in the main ES and draft CoCP, are required.

Assessment of impacts and effects

- 5.3.80 The main ES reported that works to the A53 Newcastle Road, including the reinstatement of the existing road, would temporarily require small areas of land from three residential properties in Whitmore. The main ES further reported that minor utility works would temporarily require small areas of land from two residential properties on Three Mile Lane and minor highway works would temporarily require a small area of land from a residential property on The Hill. The main ES reported that the loss of land from these residential properties would result in minor adverse effects, which are not significant.
- 5.3.81 This amendment removes the need for any land to be acquired from these properties and, therefore, will remove the minor adverse non-significant effects reported in the main ES. For further information see SES2 and AP2 ES Volume 5: Appendix CM-001-004 and SES2 and AP2 ES Volume 5: Community Map Book.

- 5.3.82 The main ES, as amended by SES1, reported that approximately 25 properties in Whitmore and Whitmore Heath would experience significant temporary adverse visual effects due to construction works. The main ES, as amended by SES1, further reported that all of these properties would experience a significant temporary adverse noise effect. The in-combination effect would result in a temporary major adverse significant effect at the 25 properties.
- 5.3.83 The amendment will remove the significant visual effect on one residential property, The Hill, which is therefore no longer subject to an in-combination significant effect. This will decrease the overall in-combination effect reported in the main ES, from 25 properties to 24 properties. This will give rise to a different in-combination effect, however this will not change the level of significance of the effect reported in the main ES, as amended by SES1. For further information see SES2 and AP2 ES Volume 5: Appendix CM-001-004 and SES2 and AP2 ES Volume 5: Community Map Book.

Mitigation and residual effects

Other mitigation measures

- 5.3.84 No mitigation measures, additional to those reported in the main ES and draft CoCP, are required.

Summary of likely residual significant effects

- 5.3.85 The amendment will give rise to a different likely residual significant temporary in-combination effect on properties in Whitmore and Whitmore Heath by reducing the number of properties subject to an in-combination effect from noise and visual effects from 25 properties to 24. However, this will not change the level of significance reported in the main ES as amended by SES1.

Cumulative effects

- 5.3.86 There are no new or different likely significant cumulative effects for community as a result of the amendment acting in combination with any other AP2 amendments.

Effects arising from operation

Avoidance and mitigation measures

- 5.3.87 No avoidance or mitigation measures, additional to those reported in the main ES, are required.

Assessment of impacts and effects

- 5.3.88 The main ES as amended by SES1, reported that approximately six properties on Snape Hall Road in Whitmore Heath would experience significant permanent adverse visual effects due to views of the operation of the HS2 route. The main ES, as amended by SES1, further reported that all of these properties would experience a significant permanent adverse noise effect. The in-combination effect would result in a permanent major adverse significant effect at the six properties. The amendment has been assessed for potential noise and visual effects to determine if these give rise to a new or different significant in-combination effect on community resources in this area. The assessment has concluded that this amendment will not give rise to any

new or different likely residual significant effects and will not change the level of significance of the effects reported in the main ES as amended by SES1.

Cumulative effects

- 5.3.89 There are no new or different likely significant cumulative effects for community as a result of the amendment acting in combination with any other AP2 amendments.

Monitoring

- 5.3.90 Volume 1 of the main ES sets out the general approach to environmental monitoring during operation of the original scheme.
- 5.3.91 There are no changes to the monitoring requirements identified in the main ES for community as a result of the amendment.

Cultural heritage

Scope, assumptions and limitations

- 5.3.92 The assessment scope, key assumptions and limitations for cultural heritage are as set out in Volume 1, the SMR and SMR Addendum of the main ES and SMR Addendum 2 (see SES2 and AP2 ES Volume 5: Appendix CT-001-000).
- 5.3.93 As the cultural heritage impacts of the amendment are not reversible, they therefore have the potential to result in new or different significant permanent construction effects only. There is no temporary construction or operational assessment for cultural heritage.

Existing environmental baseline

- 5.3.94 The baseline cultural heritage information for the Whitmore Heath to Madeley area is as described in Volume 2, CA4, Section 7 of the main ES
- 5.3.95 Archaeological features near Manor Road identified during geophysical survey (WHM031), a non-designated asset of low value, lies partially within the land required for the amendment.
- 5.3.96 Further information about this asset is provided in the main ES Volume 5: Appendix CH-002-004, the main ES Volume 5: Cultural heritage Map Book and in the Background Information and Data (BID) document CH-004-004 and Map Series CH-07 and CH08 accompanying the main ES.

Future environmental baseline

Construction (2020)

- 5.3.97 The future baseline for construction in 2020 remains unchanged from that reported in the main ES Volume 5: Appendix CT-004-000.

Effects arising during construction

Avoidance and mitigation measures

- 5.3.98 No avoidance or mitigation measures additional to those reported in the main ES and draft CoCP are required.

Assessment of impacts and effects

- 5.3.99 The main ES reported a permanent moderate adverse significant effect on archaeological features near Manor Road identified during geophysical survey (WHM031), a non-designated asset of low value. This amendment reduces the amount of land required for the scheme, which will reduce the extent of this asset that is required to be removed during construction. However, the amendment will not give rise to any new or different likely residual significant effects and will not change the level of significance of the effects reported in the main ES.
- 5.3.100 For further information see the SES2 and AP2 ES Volume 5: Cultural heritage Map Book and the SES2 and AP2 ES Volume 5: Appendix CH-003-000.

Cumulative effects

- 5.3.101 There are no new or different likely significant cumulative effects for cultural heritage as a result of the amendment acting in combination with any other AP2 amendments.

Ecology and biodiversity

Scope, assumptions and limitations

- 5.3.102 The assessment scope, key assumptions and limitations for ecology and biodiversity are as set out in Volume 1, the SMR and SMR Addendum of the main ES and SMR Addendum 2 (see SES2 and AP2 ES Volume 5: Appendix CT-001-000).
- 5.3.103 This amendment has the potential to result in new or different significant construction effects only. Therefore, there is no operational assessment for ecology and biodiversity.
- 5.3.104 Where data are limited, a precautionary baseline has been built up according to the guidance provided in the SMR and SMR Addendum. This constitutes a 'reasonable worst case' basis for the subsequent assessment.
- 5.3.105 The precautionary approach to the assessment that has been adopted identifies the likely significant environmental effects of the amendment.

Existing environmental baseline

- 5.3.106 The ecological baseline of the land required for the amendment has been based on field data collated for the main ES and SES1, aerial photography, and relevant information from regional and local sources. In addition, the baseline has been informed by additional Phase 1 habitat survey.
- 5.3.107 A summary of the baseline information relevant to the assessment of the amendment is provided below. Further detail on the relevant new or updated baseline information is provided in BID-EC-019-000, including Map Series EC-02 which accompanies the SES2 and AP2 ES; and SES2 and AP2 ES Volume 5: Appendix EC-001-000, including Map Series EC-01.
- 5.3.108 For those receptors described in the main ES, further details are provided in Volume 2, CA4, Section 8, and Volume 5: Appendix EC-001-000, including Map Series EC-01.

Baseline ecology reports that accompanied the main ES are provided in BID-EC-002-000 to BID-EC-014-000, including Map Series EC-02 to EC-12²⁷.

- 5.3.109 For those receptors described in SES₁, further details are provided in Volume 2, CA₄, Section 8. The baseline ecology report that accompanied SES₁ is provided in BID EC-004-000, including Map Series EC-02, EC-04, EC-05, EC-10, EC-11 and EC-12²⁸.

Designated sites

- 5.3.110 There are three Local Wildlife Sites (LWS) of relevance to the assessment of the amendment, which are of county value. These sites are also listed on the Ancient Woodland Inventory (AWI). These are:

- Whitmore Wood LWS, covering an area of approximately 16.6ha, which comprises ancient woodland, including an area of broadleaved semi-natural woodland and a large area of Plantation on Ancient Woodland Site (PAWS). The LWS is located within an AWI site covering an area of approximately 17.9 ha. The LWS and AWI site are partially within the area subject to the amendment;
- Hey Sprink (wood south-west of) LWS, covering an area of approximately 3ha, which comprises broadleaved semi-natural woodland containing a number of ancient woodland indicator species in the ground flora. The LWS is located within an AWI site covering an area of approximately 3.2ha. The LWS and AWI site encompasses a narrow ravine, south-east of the WCML. The LWS and AWI site are partially within the area subject to the amendment; and
- Hey Sprink (south)²⁹ LWS and AWI site, covering an area of approximately 0.9ha, which comprises a small woodland containing several ancient woodland indicator species. The LWS and AWI site are partially within the area subject to the amendment.

- 5.3.111 There is one BAS of relevance to the assessment of the amendment, which is of district/borough value. Manor Road Verges BAS, covering an area of approximately 0.4ha, is designated for verges supporting a rich diversity of ancient woodland indicator species, as well as species that indicate unimproved neutral grassland. The BAS is within the area subject to the amendment.

Habitats

- 5.3.112 Habitats within the area subject to the amendment include broadleaved woodland, broadleaved plantation woodland, marshy grassland, semi-improved neutral grassland, species-poor semi-improved grassland, amenity grassland, arable land, bare ground, species-rich and species-poor hedgerow, scattered trees, watercourses

²⁷ HS₂ Ltd (2017). *High Speed Two (HS₂) Phase 2a (West Midlands - Crewe), Background Information and Data*. Available online at: <https://www.gov.uk/government/publications/hs2-phase-2a-background-information-and-data-ecology-and-biodiversity>

²⁸ HS₂ Ltd (2018). *High Speed Two (HS₂) Phase 2a (West Midlands - Crewe), Supplementary ecological baseline data (BID EC-004-000)*. Available online at:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/692664/G33_Ecological_baseline_BID-EC-004-000_WEB.pdf

²⁹ This woodland was referred to as 'unnamed wood south of Hey Sprink' in the main ES. Since being designated an LWS, the name has been updated.

(including Meece Brook and the River Lea), waterbodies and dry ditch. The habitats of relevance to the assessment of the amendment are described in further detail below.

- 5.3.113 Ancient semi-natural woodland is present at Whitmore Wood. The site comprises areas of both ancient semi-natural woodland and plantation ancient woodland. The semi-natural areas are likely to qualify as lowland mixed deciduous woodland, a habitat of principal importance as listed under Section 41 of the Natural Environment and Rural Communities (NERC) Act (2006)³⁰ and a conservation priority of the Staffordshire Biodiversity Action Plan (BAP)³¹. The woodland resembles the National Vegetation Community (NVC) *W9a Fraxinus excelsior-Sorbus aucuparia-Mercurialis perennis* woodland typical sub-community. Plantation ancient woodland sections are dominated by larch and western red cedar. Ancient woodland indicator species including bluebell, yellow archangel, moschatel and ramsons were recorded. The woodland is located partially within the area subject to the amendment. The woodland is of county value.
- 5.3.114 Semi-natural broadleaved woodland is present at Hey Sprink (wood south-west of) LWS. The woodland comprises species including birch, alder, rowan and hawthorn and qualifies as lowland mixed deciduous woodland, which is a habitat of principal importance and a conservation priority of the Staffordshire BAP. The woodland at Hey Sprink (wood south-west of) LWS is located adjacent to the area subject to the amendment. The woodland is of county value.
- 5.3.115 Semi-natural broadleaved woodland is present at Hey Sprink (south) LWS. The woodland comprises species including oak, alder, goat willow and holly and qualifies as lowland mixed deciduous woodland, which is a habitat of principal importance and a conservation priority of the Staffordshire BAP. The woodland is located partially within the area subject to the amendment. The woodland is of county value.
- 5.3.116 Semi-natural broadleaved woodland is present at an unnamed woodland, alongside the Stone to Market Drayton Railway. The woodland is likely to qualify as lowland mixed deciduous woodland, a habitat of principal importance and a conservation priority of the Staffordshire BAP. The woodland is located partially within the area subject to the amendment. The woodland is of district/borough value.
- 5.3.117 Small areas of semi-natural broadleaved woodland are present alongside Bent Lane and at Whitmore Heath. These woodlands comprise lowland mixed deciduous woodland, a habitat of principal importance and a conservation priority of the Staffordshire BAP. These woodlands are located within the area subject to the amendment. These areas of woodland are each of local/parish value.
- 5.3.118 Broadleaved plantation woodland is present at Whitmore Heath. The woodland is located partially within the area subject to the amendment. The woodland is of local/parish value.
- 5.3.119 Five trees are present within the area subject to the amendment, that are reported in the main ES to be of a sufficient age and/or support features to indicate they are of

³⁰ Natural Environment and Rural Communities Act 2006 (2006 CHAPTER 16). Her Majesty's Stationery Office, London.

³¹ Staffordshire Biodiversity Partnership. Staffordshire Biodiversity Action Plan [online]. Available online at: <http://www.sbap.org.uk/>

veteran status. Each tree is considered to be of up to district/borough value. These are:

- a veteran oak, located within a field north of the A53 Newcastle Road/A53 Whitmore Road and south of Whitmore Road;
- three veteran oaks, located within fields north of the A53 Newcastle Road/A53 Whitmore Road and north of Baldwin's Gate; and
- a veteran oak, located on the southern edge of Whitmore Wood.

- 5.3.120 Species-rich marshy grassland is present to the east of Meece Brook. This area of grassland is characteristic of NVC community MG5b *Cynosurus cristatus-Centaurea nigra* grassland *Galium verum* sub-community and is representative of lowland meadow habitat of principal importance and a conservation priority of the Staffordshire BAP. The lowland meadow is located within the area subject to the amendment. The grassland is of county value.
- 5.3.121 Marshy grassland is present to the south of Hey Sprink LWS, located near the WCML. Species present include tall sedges, common reed, soft rush, meadowsweet and reed mace. This grassland qualifies as floodplain grazing marsh, a habitat of principal importance and a conservation priority of the Staffordshire BAP. The floodplain grazing marsh is located within the area subject to the amendment. The floodplain grazing marsh is of county value.
- 5.3.122 Unimproved neutral grassland is present at Manor Road Verges BAS. This habitat is likely to qualify as lowland meadow habitat of principal importance and a conservation priority of the Staffordshire BAP. The lowland meadow is located within the area subject to the amendment. The lowland meadow is of district/borough value.
- 5.3.123 Small areas of species-rich semi improved neutral grassland are present at Meece Brook, at Baldwins Gate, adjacent to the WCML, north of the A53 Newcastle Road and north of Manor Road. These small areas of grassland are located within or partially within the area subject to the amendment. The grassland is of local /parish value.
- 5.3.124 Areas of species-poor semi-improved grassland are present throughout the area subject to the amendment. These areas of grassland are of up to local/parish value.
- 5.3.125 The River Lea and Meece Brook and its tributaries cross the area subject to the amendment. The River Lea and Meece Brook and its tributaries may qualify as habitats of principal importance and a conservation priority of the Staffordshire BAP. These watercourses are of up to county value.
- 5.3.126 Ten ponds are located within the area subject to the amendment. On a precautionary basis, it is assumed that all ponds are habitats of principal importance and a conservation priority of the Staffordshire BAP. These waterbodies are of district/borough value.
- 5.3.127 Hedgerows within the area subject to the amendment are predominantly species-rich. Hedgerow with at least 80% cover of native woody species is a habitat of principal importance and a conservation priority of the Staffordshire BAP. These contribute towards a wider hedgerow network within the Whitmore Heath to Madeley area that is of district/borough value.

Species

- 5.3.128 Protected and/or notable species that are known or assumed to occur within the area subject to the amendment include bats, great crested newt, barn owl, breeding and wintering birds, otter, water vole, badger, polecat, harvest mouse, European hedgehog, brown hare and common reptile species.
- 5.3.129 The main ES, as amended by SES₁, reported a bat assemblage associated with habitats in the Whitmore area. Field surveys in this area recorded roosts of brown long-eared bat, including a maternity roost, roosts of a Myotis bat species and soprano pipistrelle, and foraging and commuting activity by common pipistrelle, a Myotis species bat, serotine and a Nyctalus species bat. The area subject to the amendment contains potential bat roosting, foraging and commuting habitats that are likely to be used by this bat assemblage. The bat assemblage includes several species of principal importance and other species that are conservation priorities of the Staffordshire BAP. The bat assemblage associated with habitats in the Whitmore area is of county value.
- 5.3.130 The main ES, as amended by SES₁, reported a bat assemblage associated with habitats between Hey Sprink and Barhill Wood. Field surveys in this area recorded roosts of unknown bat species, common and soprano pipistrelle and Myotis species. The area subject to the amendment contains potential bat roosting, foraging and commuting habitats that have the potential to be used by this bat assemblage. The bat assemblage includes several species of principal importance and other species that are conservation priorities of the Staffordshire BAP. The bat assemblage associated with habitats between Hey Sprink and Barhill Wood is of county value.
- 5.3.131 The main ES reported a soprano pipistrelle bat population associated with habitats at Meece Brook. The area subject to the amendment contains potential bat roosting, foraging and commuting habitats that have the potential to be used by this bat population. The soprano pipistrelle population associated with habitats at Meece Brook is of local/parish value.
- 5.3.132 The main ES reported a great crested newt metapopulation³² south of the A53 Newcastle Road/A53 Whitmore Road (AMP³³4.1). Field surveys determined the presence of great crested newt in one pond, within a network of two ponds assumed to be used by this metapopulation. The two ponds that form the metapopulation are within the area subject to the amendment. Terrestrial habitats likely to be used by this metapopulation occur within the area subject to the amendment, in the form of grassland, hedgerows and small areas of woodland. Great crested newt is an Annex 2³⁴ species, a species of principal importance, and a conservation priority of the Staffordshire BAP. The great crested newt metapopulation associated with habitats south of A53 Newcastle Road/A53 Whitmore Road is of county value.
- 5.3.133 The main ES, as amended by SES₁, reported a great crested newt metapopulation around Whitmore Heath (AMP 4.2). Field surveys confirmed the presence of great

³² A metapopulation is a group of spatially separated populations that interact. Metapopulations are described in BID-EC-007-000 (which accompanied the main ES) and BID-EC-004-000 (which accompanied the SES₁).

³³ AMP refers to Amphibian Meta Population.

³⁴ Annex 2 of the EU's Habitats Directive (1992) lists priority species whose conservation requires the designation of Special Areas of Conservation (SAC).

crested newt in 17 ponds of 28 ponds surveyed, within a network of 44 ponds assumed to be used by this metapopulation. Three of the ponds within the metapopulation are within the area subject to the amendment. Terrestrial habitats likely to be used by this metapopulation occur within the area required for the amendment, in the form of grassland, woodland and hedgerows. The great crested newt metapopulation associated with habitats around Whitmore Heath is of county value.

- 5.3.134 The main ES, as amended by SES₁, reported a great crested newt metapopulation west of Onneley (AMP 4.3). Field surveys determined the presence of great crested newt in five ponds, all of which were surveyed, within a network of 10 ponds assumed to be used by this metapopulation. None of the ponds within the metapopulation are within the area subject to the amendment. Terrestrial habitats likely to be used by this metapopulation occur within the area subject to the amendment, in the form of grassland, woodland and hedgerows. The great crested newt metapopulation associated with habitats to the west of Onneley is of county value.
- 5.3.135 The main ES reported a population of barn owl east of Whitmore, identified through field surveys and desk study records. The area subject to the amendment includes grassland habitats, arable fields, and woodland that are likely to be used by foraging barn owls, and suitable agricultural buildings and trees, which may be used by nesting barn owls. Barn owl is a conservation priority of the Staffordshire BAP. The barn owl populations east of Whitmore are of county value.
- 5.3.136 The main ES reported breeding bird and wintering bird assemblages at Meece meadows. The area subject to the amendment includes habitats likely to be used by these assemblages. The breeding bird assemblage included six species, and the wintering bird assemblage included nine species, which are of principal importance and/ or conservation priorities of the Local BAP. The breeding and wintering bird assemblages at Meece meadows are each of local/parish value.
- 5.3.137 The main ES reported breeding bird and wintering bird assemblages at Whitmore Wood. The area subject to the amendment includes habitats likely to be used by these assemblages. The breeding bird assemblage included three species, and the wintering bird assemblage included five species, which are of principal importance and/or conservation priorities of the Local BAP. The breeding and wintering bird assemblages at Whitmore Wood are each of local/parish value.
- 5.3.138 The main ES reported a population of otter on the River Lea and Meece Brook and its tributaries. Otter is an Annex 2 species, a species of principal importance and a conservation priority of the Staffordshire BAP. Sections of the River Lea and Meece Brook and its tributaries within the area subject to the amendment are likely to be used by the otter population. The otter population is of up to district/borough value.
- 5.3.139 The main ES reported assumed populations of water vole on watercourses throughout the Whitmore Heath to Madeley area including on the River Lea and Meece Brook and its tributaries. Water vole is a species of principal importance and a conservation priority of the Staffordshire BAP. Sections of the River Lea and Meece Brook and its tributaries within the area subject to the amendment are likely to be used by assumed water vole populations. The assumed water vole populations are each of up to district/borough value.

- 5.3.140 The main ES reported the presence of wood sorrel at Whitmore Wood. Wood sorrel is nationally scarce on the Staffordshire Rare Plant Register. The recorded location of wood sorrel is within the area subject to the amendment, for the purposes of mitigation planting only. The stand of wood sorrel at Whitmore Wood is of local/parish value.
- 5.3.141 The main ES, as amended by SES1, reported at least 11 social groups of badgers, identified through field surveys, throughout the Whitmore Heath to Madeley area. The area subject to the amendment includes suitable sett building and foraging habitats for badgers. The badger populations throughout the Whitmore Heath to Madeley area are of local/parish value.
- 5.3.142 The main ES reported populations of other mammals including polecat, harvest mouse, European hedgehog and brown hare, identified through desk study records, as being potentially present throughout the Whitmore Heath to Madeley area. The area subject to the amendment includes suitable habitats for these species. If present, populations of these species are of local/parish value.
- 5.3.143 The main ES reported populations of common reptile species such as grass snake and slow-worm as being potentially present at low numbers throughout the Whitmore Heath to Madeley area. Grass snake and slow-worm are both species of principal importance. Grass snake is also a conservation priority of the Staffordshire BAP. The area subject to the amendment includes suitable habitats for these species. If present, populations of these species are of local/parish value.

Future environmental baseline

Construction (2020)

- 5.3.144 The future baseline for construction in 2020 remains unchanged from that reported in the main ES Volume 5: Appendix CT-004-000.

Effects arising during construction

Avoidance and mitigation measures

- 5.3.145 The assessment assumes implementation of the measures set out within the draft CoCP.
- 5.3.146 No avoidance or mitigation measures, additional to those reported in the main ES, and draft CoCP, are required.

Assessment of impacts and effects

- 5.3.147 All of the effects within this section are reported in the absence of other mitigation.

Designated sites

- 5.3.148 The main ES reported the permanent loss of 6ha (34%) of ancient woodland (approximately 1.6ha of broadleaved semi-natural ancient woodland and approximately 4.4ha of PAWS) at Whitmore Wood LWS and AWI site, which would result in a permanent adverse effect on the structure and function of the site that is significant at county level. The amendment, specifically the removal of Whitmore Wood overbridge and the reduction in track separation distance, will reduce the loss

of ancient woodland from Whitmore Wood LWS and AWI site by 0.5ha. This will give rise to a different significant effect on Whitmore Wood LWS and AWI site. However, this will not change the level of significance of the effect as reported in the main ES.

- 5.3.149 The main ES, as amended by SES2, reported the loss of 0.2ha (7%) of broadleaved woodland from Hey Sprink (wood south-west of) LWS and AWI site, which would result in a permanent adverse effect on the structure and function of the site that is significant at the county level. The amendment, specifically the horizontal alignment changes at the Lea South embankment, will reduce the loss of woodland from Hey Sprink (wood south-west of) LWS and AWI site by approximately 0.1ha. This will give rise to a different significant effect on Hey Sprink (wood south-west of) LWS and AWI site. However, this will not change the level of significance of the effect as reported in the main ES, as amended by SES2.
- 5.3.150 The amendment will not give rise to new or different significant effects on any other designated sites due to the scale of the works and their distance from the works. It will not change the level of significance of the effects reported in the main ES, as amended by SES2.

Habitats

- 5.3.151 The main ES reported the loss of 6ha (34%) of broadleaved semi-natural ancient woodland and PAWS at Whitmore Wood LWS and AWI site, which would result in a permanent adverse effect that is significant at the county level. The amendment will reduce the extent of woodland to be lost at Whitmore Wood LWS and AWI site by 0.5ha. The reduction in woodland loss will give rise to a different significant effect. However, this will not change the level of significance of the effect as reported in the main ES.
- 5.3.152 The main ES as amended by SES2 reported the loss of 0.2ha (7%) of broadleaved semi-natural ancient woodland from Hey Sprink (wood south-west of) LWS, which would result in a permanent adverse effect that is significant at the county level. The amendment will reduce the extent of woodland to be lost at Hey Sprink (south-west of) LWS by 0.1ha. The reduction in woodland loss will give rise to a different significant effect. However, this will not change the level of significance of the effect as reported in the main ES.
- 5.3.153 The main ES reported the loss of 0.2ha (22%) of broadleaved semi-natural ancient woodland habitat from an unnamed wood south of Hey Sprink AWI site, which would result in a permanent adverse effect that is significant at the county level. This woodland has since been designated as Hey Sprink (south) LWS, as reported in SES2. The amendment will not alter the extent of woodland loss from Hey Sprink (south). The amendment will not give rise to a new or different significant effect on the woodland habitat at Hey Sprink (south) and will not change the level of significance of the effect reported in the main ES.
- 5.3.154 The main ES reported the loss of 1.9ha (38%) of broadleaved semi-natural woodland bordering the Stoke to Market Drayton Railway, which would result in a permanent adverse effect that is significant at the district/borough level. The amendment will not alter the extent of loss of woodland bordering the Stoke to Market Drayton Railway. The amendment will not give rise to new or different significant effects on the

woodland habitat bordering the Stoke to Market Drayton Railway and will not change the level of significance of the effect reported in the main ES.

- 5.3.155 The main ES reported the loss of five veteran trees within the area subject to the amendment, which would result in a permanent adverse effect that is significant at the district/borough level in each case. The amendment no longer requires the temporary diversion of the A53/Newcastle Road, which will avoid the loss of four potential veteran trees that would be lost as part of the original scheme. The amendment will remove a permanent adverse significant effect, at district/borough level, upon each of the following potential veteran trees:
- a veteran oak, located within a field north of the A53 Newcastle Road/A53 Whitmore Road and south of Whitmore Road; and
 - three veteran oaks, located within fields north of the A53 Newcastle Road/A53 Whitmore Road and north of Baldwin’s Gate.
- 5.3.156 The main ES reported the loss of 5.6ha (100%) of the species-rich marshy grassland east of Meece Brook, which would result in a permanent adverse effect on lowland meadow habitat that is significant at the county level. The amendment will not alter the extent of grassland loss at this location. The amendment will not give rise to a new or different significant effect on lowland meadow and will not change the level of significance of the effect reported in the main ES.
- 5.3.157 The main ES reported the loss of approximately 4.5ha (21%) of marshy grassland south of Hey Sprink LWS and ancient woodland located near the WCML, which would result in a permanent adverse effect on floodplain grazing marsh habitat that is significant at the county level. The amendment will not alter the extent of grassland loss at this location. The amendment will not give rise to a new or different significant effect on floodplain grazing marsh and will not change the level of significance of the effect reported in the main ES.
- 5.3.158 The main ES reported the loss of 0.4ha (100%) of unimproved neutral grassland from within Manor Road Verges BAS, which would result in a permanent adverse effect on lowland meadow habitat that is significant at the district/borough level. The amendment will not alter the extent of grassland loss from the BAS. The amendment will not give rise to a new or different significant effect on lowland meadow and will not change the level of significance of the effect reported in the main ES.
- 5.3.159 The main ES reported the realignment of Meece Brook for a length of approximately 60m, and diversion, realignment and culverting of a number of smaller watercourses. This would result in a permanent adverse effect that is significant at the district/borough level. The amendment will not alter the extent of watercourse modifications. The amendment will not give rise to new or different significant effects on The River Lea and Meece Brook and its tributaries, and will not change the level of significance of the effects reported in the main ES.
- 5.3.160 On a precautionary basis, the main ES reported that all ponds that have not been subject to survey are habitats of principal importance, a conservation priority of the Staffordshire BAP and are each up to district/borough value. There are no additional ponds located within the land required for the amendment. There is one pond located

to the north of the A53 Newcastle Road, between Baldwins Gate and Whitmore, which is within land no longer required as part of the amendment. The loss of this pond was reported in the main ES, and it will be avoided as a result of the amendment. The amendment will remove a permanent adverse effect upon this pond, which was reported as a significant effect at district/borough level within the main ES.

- 5.3.161 On a precautionary basis, the main ES reported the permanent loss of 22.7km of hedgerow habitat within the land required for construction of the original scheme within the Whitmore Heath to Madeley area, which would result in a permanent adverse effect that is significant at district/borough level. The amendment will result in the additional loss of approximately 400m of species-poor hedgerow, and the reduction in loss of approximately 1.1km of hedgerow (390m of species-rich and 710m of species-rich hedgerow) in comparison to the original scheme. In the absence of mitigation, there will be a net reduction in hedgerow loss of approximately 700m within the area subject to the amendment. In the context of the hedgerow network within the Whitmore to Madeley area, this reduced loss represents a different significant effect on the existing hedgerow network. However, this will not change the level of significance of the effect as reported in the main ES.
- 5.3.162 It is not likely that any other effects on habitats of relevance at more than the local/parish level will occur as a result of the amendment. Additional local/parish level effects arising from the AP2 revised scheme are listed in SES2 and AP2 ES Volume 5: Appendix EC-016-000.

Species

- 5.3.163 The main ES, as amended by SES1, reported the direct loss of roosts and a loss and fragmentation of foraging and commuting habitat used by the assemblage of bats in the Whitmore area, which would result in a permanent adverse effect that is significant at a county level. The amendment will reduce the loss of woodland, which will avoid the loss of a confirmed brown long-eared day roost and trees containing moderate potential for roosting bats reported in the main ES. The amendment will also avoid the loss of a building with moderate roosting potential for bats. The avoidance of loss of confirmed and assumed bat roosts will give rise to a different significant effect on the bat assemblage in the Whitmore area. However, this will not change the level of significance of the effect reported in the main ES, as amended by SES1.
- 5.3.164 The main ES, as amended by SES1, reported the direct loss of roosts and a loss of fragmentation of foraging and commuting habitat used by the assemblage of bats in the Hey Sprink to Barhill Wood area, which would result in a permanent adverse effect that is significant at a county level. The amendment will not alter the extent of loss of habitats associated with this bat assemblage. The amendment will not give rise to a new or different significant effect on the bat assemblage between Hey Sprink and Barhill Wood and will not change the level of significance of the effects reported in the main ES.
- 5.3.165 The main ES reported the loss of terrestrial habitat associated with a great crested newt metapopulation south of the A53 Newcastle Road/A53 Whitmore Road (AMP 4.1), which would result in a permanent adverse effect that is significant at a county

level. The amendment will reduce the loss of terrestrial habitat loss, including species-rich semi-improved grassland and hedgerows, reported in the main ES. The reduction in the loss of terrestrial habitat will give rise to a different significant effect on the great crested newt metapopulation south of the A53 Newcastle Road/A53 Whitmore Road. However, this will not change the level of significance of the effect reported in the main ES.

- 5.3.166 The main ES, as amended by SES₁, reported the loss of two ponds and associated terrestrial habitats that are known or assumed to be used by the great crested newt metapopulation around Whitmore Heath (AMP 4.2), which would result in a permanent adverse effect that is significant at a county level. The amendment will reduce the loss of terrestrial habitat, including ancient woodland at Hey Sprink (wood south west of), species-rich semi-improved grassland and hedgerows. The reduction in the loss of terrestrial habitat will give rise to a different significant effect on the great crested newt metapopulation around Whitmore Heath. However, this will not change the level of significance of the effect reported in the main ES.
- 5.3.167 The main ES, as amended by SES₁, reported the loss and fragmentation of terrestrial habitats associated with a great crested newt metapopulation situated west of Onneley (AMP 4.3), which would result in a permanent adverse effect that is significant at a county level. The amendment will not alter the extent of loss of habitats associated with this great crested newt metapopulation. The amendment will not give rise to a new or different significant effect on the metapopulation AMP 4.3 west of Onneley and will not change the level of significance of the effects reported in the main ES.
- 5.3.168 The main ES reported the loss of barn owl foraging habitat and potential roosting sites associated with barn owl populations east of Whitmore, which would result in a permanent adverse effect that is significant at up to county level. The amendment will not materially alter the loss of habitats likely to be used by barn owl. The amendment will not give rise to a new or different significant effect on the barn owl populations east of Whitmore and will not change the level of significance of the effects reported in the main ES.
- 5.3.169 It is not likely that any other effects on species of relevance at more than the local/parish level will occur as a result of the amendment. Additional local/parish level Effects arising from the AP2 revised scheme are listed in SES2 and AP2 ES Volume 5: Appendix EC-016-000.

Mitigation and residual effects

Other mitigation measures

- 5.3.170 The amendment will result in a change in the extent and distribution of grassland habitat creation. Grassland habitat creation at Snape Hall Road within the original scheme will be reduced by approximately 400m² to allow for the construction of a balancing pond. However, as a result of the horizontal alignment changes associated with the amendment an additional 1.3ha of grassland habitat creation will be provided on the southern side of the HS2 route adjacent to the River Lea viaduct. Grassland habitat creation in these locations, forms part of the route-wide approach to compensate for loss of grassland. There will be a net gain of approximately 1.3ha of grassland habitat creation, in comparison to the original scheme.

- 5.3.171 The amendment will result in a change in the extent and distribution of woodland habitat creation and enhancement, as summarised below, none of which will give rise to new or different significant effects:
- creation of a new balancing pond adjacent to Stableford North embankment will reduce the area of woodland habitat creation in this location by 0.8ha. Further woodland reconfiguration associated with alignment changes, will result in the increase of woodland planting around Meece Brook by approximately 0.5ha. The amendment will result in the net loss of 0.3ha of woodland habitat creation at these locations, which was provided within the original scheme to compensate for losses of woodland that are local level effects;
 - reconfiguration of woodland habitat creation around the porous portal existing A53 Newcastle Road, which will result in the addition of 600m² of woodland habitat creation in this location; and
 - removal of Whitmore Wood overbridge and the reduction in track separation distance, will reduce the loss of ancient woodland from Whitmore Wood LWS and AWI site by 0.5ha. This area will be retained within the land required for the amendment for the purposes of ancient woodland enhancement.

5.3.172 The main ES reported the creation of a pond within a woodland habitat creation area to the north of the A53 Newcastle Road to compensate for loss of an existing pond to construction of the original scheme. The pond loss will be avoided as a result of the amendment, and the replacement pond will therefore no longer be provided.

5.3.173 The amendment will result in a change in the extent and distribution of hedgerow habitat creation. Approximately 740m of additional hedgerow habitat creation will be provided along a new access track off Manor Road. Several smaller reductions in hedgerow habitat creation will occur throughout the area subject to the amendment. The combined result of these changes will be an increase in hedgerow habitat creation within the area subject to the amendment by approximately 400m in comparison to the original scheme. As reported in the assessment of effects section, there is a net reduction in existing hedgerow loss of approximately 700m as a result of the amendment. Therefore, taking into account the additional avoidance of existing hedgerow and the increase in compensatory hedgerow planting, there will be an increase in length of hedgerow after mitigation of approximately 1.1km in comparison to the original scheme, within the area subject to the amendment.

Summary of likely residual significant effects

5.3.174 The amendment will remove permanent adverse residual effects upon four assumed veteran trees, which were reported as significant effects at district/borough level in the main ES.

5.3.175 The amendment will result in a different significant adverse residual effect upon ancient woodland in comparison to that reported in the main ES. This is the result of the reduction in loss of approximately 0.6ha of ancient woodland from Whitmore Wood LWS and AWI site and Hey Sprink (wood south-west of) LWS and AWI site. However, a permanent adverse residual effect upon ancient woodland will still occur, which remains significant at county level.

- 5.3.176 The amendment will result in a different significant adverse residual effect upon the hedgerow network in the Whitmore Heath to Madeley area in comparison to that reported in the main ES, as amended by SES1. This is the result of the increase in hedgerow after mitigation of approximately 1.1km within the area subject to the amendment, in comparison to the original scheme. However, a permanent adverse residual effect upon the hedgerow network in the Whitmore Heath to Madeley area will still occur, which remains significant at district/borough level. As reported in the main ES, the reinstatement of existing hedgerow within land required only for construction provides an opportunity to reduce this residual effect to a level that is not significant.

Cumulative effects

- 5.3.177 There are no new or different likely significant cumulative effects for ecology and biodiversity as a result of the amendment acting in combination with any other AP2 amendments. The combined effect on hedgerows as a result of the AP2 revised scheme is reported at a route-wide level in SES2 and AP2 ES, Volume 3, Route-wide effects.

Landscape and visual

Scope, assumptions and limitations

- 5.3.178 The assessment scope, key assumptions and limitations for landscape and visual are as set out in Volume 1, the SMR and SMR Addendum of the main ES.
- 5.3.179 The amendment has the potential to result in new or different significant construction and operational effects for landscape and visual. Therefore, both construction and operational phases for landscape and visual are considered in this assessment.

Existing environmental baseline

- 5.3.180 The baseline landscape and visual information for the Whitmore Heath to Madeley area is as described in Volume 2, CA4, Section 11 of the main ES.

Landscape baseline

- 5.3.181 The amendment to change the vertical and horizontal alignment is located within the following four landscape character areas (LCAs) as described in Volume 5: LV-001-004 of the main ES and summarised below.

Upper Meece Brook Valley Alluvial Lowlands LCA

- 5.3.182 Upper Meece Brook Valley Alluvial Lowlands LCA includes the valley of the Meece Brook, which widens and forks to the north of the LCA. The low lying fields of rough grazing, marsh and heath along the valley extend up into narrower tributary stream valleys. This is a working agricultural landscape bounded by the WCML to the south-west and west. Willow carr is present along Meece Brook, and an area of raised bog near Chorlton Moss. The overhead line equipment of the WCML is a noticeable feature in the valley and the rail line limits public rights of way (PRoW) access across the area. The higher arable and drier farmland in the adjoining LCAs contrast with the lower wetter farmland of the valley.

Upper Meece Brook Valley Ancient Redlands LCA

- 5.3.183 Upper Meece Brook Valley Ancient Redlands LCA lies north-west of Swynnerton Old Park. The area is defined by a rolling ridge and valley landform with views to distinctive ridgeline woodlands at the designed landscape of Whitmore Hall. Medium and large-scale rectilinear arable fields are defined by a fragmented hedgerow network. Rural lanes, a small PRow network and farm tracks serve the occasional scattered farmsteads and the hamlet of Acton to the north-east. Proximity to the A53 Newcastle Road and WCML and agricultural intensification has eroded scenic quality.

Upper Lea Valley Ancient Redlands LCA

- 5.3.184 Upper Lea Valley Ancient Redlands LCA is a broad valley landscape of well managed extensive farmland which forms part of the wider setting of Whitmore Heath, Madeley Park Wood and Baldwin's Gate. The valley floor includes an area of floodplain grazing and improved pasture. Part of the valley side is included within this LCA and is characterised by sloping pastures with prominent 'shaws' (linear woodland belts). The River Lea itself is inconspicuous. The WCML runs along the valley floor mainly at grade with the valley sides as a backdrop. The out of use Stoke to Market Drayton Railway (also known as the Silverdale line of the Stoke to Market Drayton Railway) and Madeley Chord, is a distinctive landscape feature which bisects the valley near Hey Sprink. A small PRow network and the regionally promoted Newcastle Way connect into the wider area.

Hey Sprink Ancient Redlands and Woodlands LCA

- 5.3.185 Hey Sprink Ancient Redlands and Woodlands LCA is located to the north-west of Swynnerton Old Park. It is defined by a rolling plateau edge landform overlain by a small-scale pattern of rectilinear and partly irregular fields, interspersed with some medium and large woodland blocks. These include Hey Sprink and Whitmore Wood Ancient Woodlands, which contribute to the extensive wooded skylines within this LCA. Farmsteads and residential properties are dispersed through the landscape. The largest settlement is Whitmore Heath, where individually designed detached properties with large gardens occupy an elevated wooded situation above the River Lea valley. The WCML to the west and M6 to the north-east are audible in less sheltered areas. The PRow network runs to the edges of the LCA, but there is limited public access through the woodland.

Visual baseline

- 5.3.186 The amendment has the potential to affect the following viewpoints, which are described in Volume 5: LV-001-004 of the main ES:

View north-east from farmland close to WCML (viewpoint 020.03.011)

- 5.3.187 This viewpoint is transitional between the large scale open and gently undulating farmland of the Meece Brook valley to the north and small-scale rolling pastoral farmland to the west. The foreground comprises large, open and rolling arable fields with the WCML in shallow cutting within the flat valley floor. Intermittent trees and some ponds mark the course of Meece Brook. Beyond the valley floor the landscape rises up to a ridgeline. On the far side of the valley the land also rises up to a ridgeline.

The field pattern is well defined by robust hedgerows. The distant horizon comprises well wooded farmland.

View north from junction of farmland near Baldwin's Gate (viewpoint 020.03.022)

- 5.3.188 This viewpoint is located in an area of small-scale rolling pastoral farmland overlooking the large-scale open and gently undulating farmland of the Meece Brook valley. Fields are enclosed by post and wire fencing with occasional trees. The WCML is seen in the middle distance both at grade and in exposed sandstone cutting. In the background, arable fields and pastures rise steeply to the north and east to localised areas of high ground, where the hedged arable fields and pastures become smaller, with a higher prevalence of trees. The horizon is formed by a wooded ridgeline.

View north-east from farmland near water treatment works (viewpoint 020.03.010)

- 5.3.189 This viewpoint is located close to the Severn Trent Whitmore Borehole Facility in an area of wet grassland and foreground pastures alongside Meece Brook within the large-scale, open and gently undulating farmland of the Meece Brook valley. Occasional mature hedgerow trees and copses add visual interest to the landscape. The land rises to localised high points which restrict views of a well-wooded ridgeline in the distance. The mixed woodlands of Swynnerton Old Park (ancient woodland and conifer plantation) are visible on the skyline.

View east from the A53 Newcastle Road near The Hill (viewpoint 020.02.021)

- 5.3.190 This viewpoint is located in an area of mainly open gently rolling arable fields and pastures with localised areas of higher ground. The foreground comprises the A53 Newcastle Road which is bounded by hedgerows and mature trees. Beyond the road, large, open arable fields and pastures with localised areas of high ground extend into the middle distance. On the crest of the high ground to the left is a prominent tree avenue which highlights a field access track leading from the A53 Newcastle Road. Trees around Whitmore are visible in long distance views, but the rising landform screens distant views to the east whilst two localised areas of high ground frame views to the south.

View south-west from Rectory Lane (viewpoint 020.02.016)

- 5.3.191 This viewpoint is located on the boundary of an area of small to medium scale rolling pastures with robust hedgerows and many mature trees, and an area of lower lying, rectilinear arable fields with intermittent hedgerows and few trees. Beyond Rectory Lane in the foreground, there are views of gently rolling, sloping pastures with mature hedgerows and field trees. These continue into the middle distance, where a residential property is visible. The A53 Newcastle Road runs in shallow cutting, bounded by hedgerows either side, which mostly obscure views of passing cars. A prominent avenue of mature trees follows a farm access track on the crest of a ridge leading to the A53 Newcastle Road. Long distance views comprise rolling farmland with woodland belts, pastures and hedgerows merging into distant wooded ridgelines.

View east from farmland near Snape Hall Farm (viewpoint 021.02.005)

- 5.3.192 This viewpoint is located in the low lying, flat and open pastures and floodplain grazing marsh of the River Lea valley. Foreground views comprise open pasture bounded by robust hedgerows and the agricultural buildings of Snape Hall Farm. Whitmore Wood ancient woodland is prominent in the middle distance on the valley side. The well-treed residential area of Whitmore Heath is also visible. A gap between the woodland blocks reveals views of residential properties and groups of trees. There are no distant skyline views due to the elevated, well-wooded landform.

View north-east from farmland east of Madeley Park Farm and view north-east from edge of Madeley Park Wood (viewpoints 021.02.007 and 021.02.008)

- 5.3.193 These viewpoints are located on the edge of the low lying, flat and open pastures and floodplain grazing marsh of the River Lea valley. Gently sloping pastures bounded by post and wire fencing and fragmented hedgerows slope down to the WCML which runs across the valley floor. Beyond the WCML in the background, the rising valley sides comprise pastures bounded by robust hedgerows, above which is Whitmore Wood ancient woodland which forms the middle distance skyline and screens more distant views. Snape Hall Farm is prominent beyond the WCML, whilst several large properties can be seen within the woodland at Whitmore Heath.

View north-east from Manor Road (viewpoints 021.03.013 and 022.02.001)

- 5.3.194 These viewpoints are located in an area of large, open undulating pastures bounded by robust hedgerows with occasional trees and copses. These slope down towards the WCML, which runs along the valley floor of the River Lea. The overhead line equipment of the WCML and passing trains are prominent. Further pastures are also visible on the far side of the valley, gently rising up to prominent hanging and ridge top woodland (Hey Sprink Wood). Individual mature trees, hedgerows and 'shaws' (linear tree belts) form field boundaries on the far valley side. Distant skyline views are screened by intervening landform and roadside vegetation on Manor Road.

View south-west from Madeley Parish Cemetery (viewpoint 022.03.024)

- 5.3.195 This viewpoint is located within a small cemetery in an area of large open and flat or gently undulating arable fields and pastures bounded by fragmented hedgerows with mature field and hedgerow trees. The foreground comprises the cemetery landscape with tarmac footpaths and some mature trees. To the west, the cemetery is bounded by timber fencing, which screens views of Manor Road beyond. Hedgerows filter views out across the pasture to the south-west. Beyond Manor Road, in the middle distance, the landform rises sharply to form a low hill comprising open pasture with occasional mature trees. This landform restricts more distant skyline views.

Future environmental baseline

Construction (2020) and operation (2027)

- 5.3.196 The future baseline for construction in 2020 and operation in 2027 remains unchanged from that reported in the main ES Volume 5: Appendix CT-004-000.

Temporary effects arising during construction

Avoidance and mitigation measures

- 5.3.197 No avoidance or mitigation measures, additional to those reported in the main ES and draft CoCP, are required.

Assessment of impacts and effects

Landscape assessment

Upper Meece Brook Valley Alluvial Lowlands LCA

- 5.3.198 The main ES reported a major adverse significant effect on the Meece Brook Valley Alluvial Lowlands LCA due to construction activity associated with Meece Brook viaduct, Meece embankment and Bent Lane (North) diversion. This activity, combined with the presence of site haul routes, construction plant, material stockpiles, and changes to the landform, would intensify the severance currently experienced due to the presence of the WCML and introduce new uncharacteristic features that would alter much of the landscape within this LCA. Cranes used for construction of Meece Brook viaduct would also impact skyline character.
- 5.3.199 The amendment to change the vertical and horizontal alignment and the consequent reduction in height of Meece Brook viaduct by approximately 2.2m, will slightly reduce the construction effect on the landscape of this LCA, compared to the original scheme. This improvement will however be minimal given the wider construction activity in this area, which will be extensive. The amendment will therefore not result in a new or different significant effect and will not change the level of significance of the effect reported in the main ES.

- 5.3.200 For further information see SES2 and AP2 ES Volume 5: Appendix LV-001-004 and SES2 and AP2 ES Volume 5: Landscape and visual Map Book.

Upper Meece Brook Valley Ancient Redlands LCA

- 5.3.201 The main ES reported a major adverse significant effect on the Upper Meece Brook Valley Ancient Redlands LCA. This was due to construction of Stableford North embankment, Meece embankment, Whitmore South cutting, Whitmore Heath tunnel, and the southern porous portal of Whitmore Heath tunnel and associated earthworks. This activity, combined with the presence of the A53 Newcastle Road transfer node, site haul routes, construction plant and material stockpiles, would substantially change the rural character in terms of landform and the pattern of arable fields and pastures. The western part of the LCA would be particularly affected.
- 5.3.202 The amendment to change the vertical and horizontal alignment and the consequent reduction in height of Meece Brook viaduct by approximately 2.2m, will slightly reduce the construction effect on the landscape of this LCA, compared to the original scheme. This improvement will however be minimal given the wider construction activity in this area, which will be extensive. The amendment will therefore not result in a new or different significant effect and will not change the level of significance of the effect reported in the main ES.

- 5.3.203 For further information see SES2 and AP2 ES Volume 5: Appendix LV-001-004 and SES2 and AP2 ES Volume 5: Landscape and visual Map Book.

Upper Lea Valley Ancient Redlands LCA

- 5.3.204 The main ES reported a major adverse significant effect on the Upper Lea Valley Ancient Redlands LCA. This was due to construction of the northern porous portal of Whitmore Heath tunnel (including night-time lighting of the tunnel boring works), Whitmore Wood retaining wall, Whitmore North cutting, Lea South embankment, River Lea viaduct, Lea North embankment and the excavation of the borrow pit west of Netherset Hey Farm. This activity, combined with the presence of the viaduct launching yard and associated site haul routes and construction plant (including cranes), and removal of part of Whitmore Wood, would substantially alter some landscape features which are characteristic of this LCA. This includes the severance of 'shaws' (linear tree belts) on the valley side.
- 5.3.205 The amendment will require some reconfiguration of the construction elements within the LCA. For example, construction of Lea South embankment and River Lea viaduct will be moved approximately 10m to the south-west. This will require relocation of the construction works associated with Whitmore North auto-transformer station to the south-east, leading to a reconfiguration of the landscape earthworks and landscape mitigation planting to suit the new HS2 route alignment. The construction effect of these changes on the landscape character of this LCA will be minimal given wider construction activity in this area, which will be extensive. The amendment will therefore not result in a new or different significant effect and will not change the level of significance of the effect reported in the main ES.
- 5.3.206 For further information, see SES2 and AP2 ES Volume 5: Appendix LV-001-004.

Hey Sprink Ancient Redlands and Woodlands LCA

- 5.3.207 The main ES reported a moderate adverse significant effect on the Hey Sprink Ancient Redlands and Woodlands LCA. This was due to construction of Whitmore Heath tunnel (including night-time lighting of the tunnel boring works), porous portals (both northern and southern) and tunnel head walls. This activity, combined with the presence of Whitmore North cutting satellite compound, removal of part of Whitmore Wood, and widening of Snape Hall Road (removing mature hedgerows and trees), would substantially alter the landscape character along the western side of the LCA. The visual relationship to the adjoining valley floor landscape (within the Upper Lea Valley Ancient Redlands LCA) would also be disrupted.
- 5.3.208 The amendment will remove construction effects associated with Whitmore Wood overbridge, although new construction effects will be introduced from construction of Whitmore Wood underbridge. These effects will, however, be very localised and will not affect the wider Hey Sprink Ancient Redlands and Woodlands LCA, which will continue to be affected by construction of the porous portals at either end of Whitmore Heath tunnel, Whitmore North cutting, Whitmore Wood retaining wall and closure of Snape Hall Road. The amendment will therefore not result in a new or different significant effect and will not change the level of significance of the effect reported in the main ES.

- 5.3.209 For further information see SES2 and AP2 ES Volume 5: Appendix LV-001-004 and SES2 and AP2 ES Volume 5: Landscape and visual Map Book.

Visual assessment

View north-east from farmland close to WCML (viewpoint 020.03.011)

- 5.3.210 The main ES reported a major adverse significant effect due to construction activity associated with Meece Brook viaduct, Meece embankment, and Bent Lane (North) diversion. This activity, combined with the presence of Stableford North embankment satellite compound, would introduce prominent and uncharacteristic elements into close and middle distance views across the small-scale rolling pastoral landscape and interrupt the relatively open views towards Swynnerton Old Park and the Hanchurch Hills. Cranes used for construction of the Meece Brook viaduct would be visible on the skyline.

- 5.3.211 The amendment to change the vertical and horizontal alignment and consequent reduction in height of Meece Brook viaduct by approximately 2.2m, will slightly reduce the effect on the view, compared to the original scheme. This improvement will however be minimal when seen alongside the wider construction activity in this area, which will be extensive. The amendment will therefore not result in a new or different significant effect and will not change the level of significance of the effect reported in the main ES.

- 5.3.212 For further information see SES2 and AP2 ES Volume 5: Appendix LV-001-004 and SES2 and AP2 ES Volume 5: Landscape and visual Map Book.

View north-east from the western side of the Meece Brook valley from junction of farmland near Baldwin's Gate (viewpoints 020.03.10 and 020.03.022)

- 5.3.213 The main ES reported a moderate adverse significant effect due to construction activity associated with Meece embankment, Whitmore South cutting and associated earthworks. This activity, combined with the presence of material stockpiles and a transfer node adjacent to the A53 Newcastle Road, would introduce uncharacteristic new elements into middle and long distance views across the large-scale pastoral Meece Brook valley. Views towards the wooded skyline of Swynnerton Old Park on the distant horizon would be interrupted. Construction of the A53 Newcastle Road temporary diversion and A53 Newcastle Road overbridge and embankments would also be visible in the distance. Cranes for construction of Meece Brook viaduct would affect skyline views. Overall, although the construction activity would be extensive, however it would only affect part of the view from these viewpoints.

- 5.3.214 The amendment to change the vertical and horizontal alignment and consequent reduction in height of Meece Brook viaduct by approximately 2.2m, will slightly reduce the effect on the view, compared to the original scheme. This improvement will however be minimal when seen alongside the alongside the wider construction activity in this area, which will be extensive. The amendment will therefore not result in a new or different significant effect and will not change the level of significance of the effect reported in the main ES.

- 5.3.215 For further information see SES2 and AP2 ES Volume 5: Appendix LV-001-004 and SES2 and AP2 ES Volume 5: Landscape and visual Map Book.

View east from the A53 Newcastle Road near The Hill (viewpoint 020.02.021)

- 5.3.216 The main ES reported a major adverse significant effect due to construction activity associated with the A53 Newcastle Road overbridge, A53 Newcastle Road temporary diversion, southern end of the Whitmore Heath tunnel and southern porous portal of Whitmore Heath tunnel. This activity, combined with the presence of Whitmore Heath tunnel south portal satellite compound, would be visible in close distance views. The associated earthworks would be extensive and complex, with large-scale excavation and movement of material, as well as prominent landform changes. The combined effects of the works would completely alter the gently rolling pastoral and arable farmland and rural visual character of the landscape around The Hill.
- 5.3.217 The amendment will relocate construction activity approximately 180m to the south and remove all construction activity associated with A53 Newcastle Road overbridge which is no longer proposed. This will change the level of significance of the effects reported in the main ES, from major adverse significant to negligible non-significant.
- 5.3.218 The main ES also reported a moderate adverse significant effect arising from night-time lighting of the tunnel boring works. This would intensify the existing light spill from vehicles on the A53 Newcastle Road and properties including The Hill and those along the A53 Newcastle Road and Rectory Lane.
- 5.3.219 By extending the southern end of Whitmore Heath tunnel approximately 180m to the south, the effect of night-time lighting of the tunnel boring works will be reduced. This will reduce the level of significance of the effects reported in the main ES, from moderate adverse significant to minor adverse non-significant.

For further information see SES2 and AP2 ES Volume 5: Appendix LV-001-004 and SES2 and AP2 ES Volume 5: Landscape and visual Map Book.

View south-west from Rectory Lane (viewpoint 020.02.016)

- 5.3.220 The main ES reported a major adverse significant effect due to construction activity associated with the A53 Newcastle Road overbridge, A53 Newcastle Road temporary diversion, Whitmore Heath tunnel and southern porous portal of the Whitmore Heath tunnel. This activity, combined with the presence of Whitmore Heath tunnel satellite compound, would be visible in close and middle distance views. The associated earthworks would be extensive and complex, with large scale excavation and movement of material, as well as prominent landform changes. Views would be partially filtered by the intervening landform and vegetation, but the combined effects of the works would substantially change the current outlook across gently rolling farmland. A prominent avenue of mature trees on the crest of a localised ridge between Baldwin's Gate and Whitmore would be removed.
- 5.3.221 The amendment will relocate the construction activity approximately 180m to the south and remove much of the construction from the view, including that associated with the A53 Newcastle Road overbridge, which is no longer proposed.
- 5.3.222 Construction activity associated with the relocated southern porous portal will still, however, be visible in the distance and will include removal of the avenue of mature trees on the ridge line.

- 5.3.223 This will reduce the level of significance of the effects reported in the main ES, from major adverse significant to minor adverse non-significant.
- For further information see SES2 and AP2 ES Volume 5: Appendix LV-001-004 and SES2 and AP2 ES Volume 5: Landscape and visual Map Book.
- View east from farmland near the edge of Madeley Park Wood (viewpoints 021.02.005, 021.02.007 and 021.02.008)*
- 5.3.224 The main ES reported a major adverse significant effect due to construction activity associated with various elements of the original scheme. This includes the northern porous portal of the Whitmore Heath tunnel, a pumping station, tunnel portal building, Whitmore North cutting, Whitmore Wood retaining wall, Whitmore Wood overbridge and associated earthworks. The extensive excavation and movement of material, alterations to the landform and tree removal within Whitmore Wood would be prominent in close and middle distance views. This activity, combined with the presence of construction equipment, excavated material stockpiles and movement of construction vehicles, would substantially alter the key characteristics of the rural view. Works and cranes associated with the River Lea viaduct and Lea South embankment would also be distantly visible. Levelling for the Whitmore North cutting satellite compound would intensify the artificial changes to the landform in this area.
- 5.3.225 The amendment includes a number of proposals which will affect the view, including realigning the HS2 route approximately 10m closer to the viewpoint and replacing Whitmore Wood overbridge with the Whitmore underbridge. Overall, views will be slightly improved compared to the original scheme, mainly through the removal of construction activity associated with Whitmore Wood overbridge. Construction of other components of the scheme listed above will continue to affect the view as described in the main ES. The amendment will therefore give rise to a different significant effect. However, the level of significance will remain major adverse significant as reported in the main ES.
- 5.3.226 The view of the amendment from viewpoint 021.02.005 during construction is illustrated on the photomontage shown in Figure LV-01-608 in the SES2 and AP2 ES Volume 5: Appendix LV-001-004.
- For further information see SES2 and AP2 ES Volume 5: Appendix LV-001-004 and SES2 and AP2 ES Volume 5: Landscape and visual Map Book.
- View north-east from Manor Road (viewpoint 021.03.013 and Viewpoint 022.02.001)*
- 5.3.227 The main ES reported a major adverse significant effect due to construction activity associated with Lea South embankment, River Lea viaduct and Whitmore North auto-transformer station. This activity and associated earthworks and material stockpiles would introduce incongruous new features into middle distance rural views across the open farmland of the River Lea valley. Views of the woodland 'shaws' and Hey Sprink woodland on the opposite valley side would be interrupted and the rural outlook substantially changed. Cranes used for constructing the River Lea viaduct would be prominent skyline features. Although not seen at close range, the construction activity would be visible across the full width of the view.

- 5.3.228 The amendment to extend Whitmore tunnel will realign Lea South embankment and the River Lea viaduct approximately 10m to the south-west. This will require the relocation of Whitmore North auto-transformer station to the south-east. In turn the landscape earthworks and landscape mitigation planting will be reconfigured to suit the new HS2 route and earthworks. These changes will lead to a slight rearrangement of the construction works within the view compared to the original scheme, but the effects on the view will be minimal when seen alongside the alongside the wider construction activity in this area, which will be extensive. The amendment will therefore not result in a new or different significant effect and will not change the level of significance of the effect reported in the main ES.

For further information see SES2 and AP2 ES Volume 5: Appendix LV-001-004 and SES2 and AP2 ES Volume 5: Landscape and visual Map Book.

View south-west from Madeley Parish Cemetery (viewpoint 022.03.024)

- 5.3.229 The main ES reported a major adverse effect due to the open and close-distance views of construction activity associated with Lea North embankment and Manor Road overbridge. Hey House Lodge which is visible to the south would be demolished, whilst to the north and east, the excavation and working of a borrow pit west of Netherset Hey Farm means that the cemetery would largely be surrounded by construction works. Loss of hedgerow field boundaries and trees would open up more views of construction. The rural outlook and tranquil setting of the cemetery would completely change due to the scale of construction which would include extensive earthworks and movement of excavated material.
- 5.3.230 The amendment will result in minor changes to the alignment of Manor Road and Manor Road overbridge. Manor Road will increase in height by approximately 1m and the embankment footprint will widen by up to 5m. This will bring construction of Manor Road overbridge and Lea North embankment slightly closer to the viewpoint and further increase the visual effects and disturbance on visitors to the cemetery compared to the original scheme. The amendment will therefore give rise to a different significant effect. However, the level of significance of the effect will remain major adverse significant as reported in the main ES.
- 5.3.231 For further information see SES2 and AP2 ES Volume 5: Appendix LV-001-004 and SES2 and AP2 ES Volume 5: Landscape and visual Map Book.

Mitigation and residual effects

Other mitigation measures

- 5.3.232 No mitigation measures, additional to those reported in the main ES and draft CoCP, are identified.

Summary of likely residual significant effects

- 5.3.233 The temporary residual significant effects during construction remain as described above. These effects will be temporary and reversible in nature lasting only for the duration of the construction works. These residual effects will generally arise from the widespread presence of construction activity and construction plant within the landscape and viewed by surrounding residents, and users of PRow and main roads within the study area.

5.3.234 The significant effects that will remain after implementation of construction phase mitigation are summarised below.

5.3.235 The amendment to change the vertical and horizontal alignment will remove the likely residual significant construction effects which were reported in the main ES at the following viewpoints:

- view east from the A53 Newcastle Road near The Hill (viewpoint 020.02.021) – major adverse significant effect will reduce to negligible adverse non-significant and at night a moderate adverse significant effect will reduce to minor adverse non-significant; and
- view south-west from Rectory Lane (viewpoint 020.02.016) – major adverse significant effect will reduce to non-significant.

5.3.236 The amendment will give rise to a different likely residual significant construction effect at the following viewpoints. However, this will not change the level of significance of the effects reported in the main ES:

- view east from farmland near Snape Hall Farm (viewpoint 021.02.005) – the effect will decrease but will remain major adverse significant;
- view north-east from farmland east of Madeley Park Farm (viewpoint 021.02.007) – the effect will decrease but will remain major adverse significant;
- view north-east from edge of Madeley Park Wood (viewpoint 021.02.008) – the effect will decrease but will remain major adverse significant; and
- view south-west from Madeley Parish cemetery (viewpoint 022.03.024) – the effect will increase but will remain major adverse significant.

Cumulative effects

5.3.237 There are no new or different likely significant cumulative effects for landscape and visual as a result of the amendment acting in combination with any other AP2 amendments.

Permanent effects arising during operation

Avoidance and mitigation measures

5.3.238 No avoidance or mitigation measures, additional to those reported in the main ES, are required.

Assessment of impacts and effects

Landscape assessment

Upper Meece Brook Valley Alluvial Lowlands LCA

5.3.239 The main ES reported a major adverse significant effect at year 1, reducing to moderate adverse at year 15 through to year 60 despite the introduction of hedgerow and woodland habitat creation. This was due to the prominence of Meece Brook viaduct (and the operational railway) and Meece embankment, both of which are

large scale uncharacteristic features which would reduce scenic quality, introduce a sense of severance in relation to rural character, disrupt the existing field pattern, and introduce intermittent disturbance, which will locally reduce the tranquillity of the landscape.

- 5.3.240 At year 1, year 15 and year 60, the amendment to change the vertical and horizontal alignment and consequent reduction in height of Meece Brook viaduct by approximately 2.2m, will slightly reduce the effect on landscape character, compared to the original scheme. However, this will be very localised and will not affect the landscape character of the wider Upper Meece Brook Valley Alluvial Lowlands LCA, which will continue to be affected by the presence of the Meece Brook viaduct and the operational railway. The amendment will therefore not result in a new or different significant effect and will not change the level of significance of the effect reported in the main ES.

For further information see SES2 and AP2 ES Volume 5: Appendix LV-001-004 and SES2 and AP2 ES Volume 5: Landscape and visual Map Book.

Upper Meece Brook Valley Ancient Redlands LCA

- 5.3.241 The main ES reported a major adverse significant effect during year 1, reducing to moderate adverse at year 15 through to year 60. This was due to the substantial changes to the landform and field pattern caused by the presence of the Stableford North embankment, Bent Lane (North) diversion, Meece embankment and the A53 Newcastle Road overbridge. By year 15, the Stableford North embankment and Meece embankment would remain prominent features despite the presence of maturing mitigation planting.

- 5.3.242 At year 1, year 15 and year 60, the amendment to change the vertical and horizontal alignment will remove the northern section of Meece Brook viaduct out of the Upper Meece Brook Valley Ancient Redlands LCA. The Meece embankment will be lowered by up to 3.3m. There will be a slight reduction in the effect on landscape character compared to the original scheme, however this will be very localised and will not affect the wider Upper Meece Brook Valley Ancient Redlands LCA, which will continue to be affected by the presence of the Stableford North embankment, Bent Lane (North) diversion, and new A53 Newcastle Road overbridge. The amendment will therefore not result in a new or different significant effect and will not change the level of significance of the effect reported in the main ES.

For further information see SES2 and AP2 ES Volume 5: Appendix LV-001-004 and SES2 and AP2 ES Volume 5: Landscape and visual Map Book.

Upper Lea Valley Ancient Redlands LCA

- 5.3.243 The main ES reported a major adverse significant effect at year 1 reducing to moderate adverse at year 15 and non-significant at year 60. This was due to the substantial changes to the landscape associated with the presence of the southern porous portal of Whitmore Heath tunnel and associated infrastructure, River Lea viaduct and associated embankments, and the diverted section of Manor Road. There would be a permanent change to features which are distinctive to the LCA, including the loss of part of the 'shaws' (linear tree belts), severance of the rural landscape on the eastern valley side, and the loss of woodland around the Stoke to

Market Drayton Railway and Madeley Chord rail lines. Scenic quality would be reduced due to the presence of new uncharacteristic landscape features and artificial landforms. As the mitigation planting matures, the impacts on the landscape would lessen as the new landform and infrastructure become better integrated within the surrounding landscape.

- 5.3.244 At year 1, the amendment to change the vertical and horizontal alignment will not change the effect on the shaws and rural landscape on the eastern side of the River Lea valley reported in the main ES. The Lea South embankment and River Lea viaduct will be moved approximately 10m to the south-west, which will require a relocation of the Whitmore North auto-transformer station to the south-east. This will lead to a reconfiguration of the landscape earthworks and landscape mitigation planting to suit the new HS2 route alignment. These changes will be minimal given the scale of the operational effects on the landscape character of the wider LCA, particularly at year 1 before the mitigation planting matures. The amendment will therefore not result in a new or different significant effect and will not change the level of significance of the effect reported in the main ES.
- 5.3.245 At year 15, the maturing mitigation planting associated with the amendment will achieve a similar level of screening and integration of the operational railway within the surrounding landscape. The amendment will therefore not give rise to a new or different significant effect and will not change the level of significance of the effect reported in the main ES. At year 60, the level of significance of the effect will remain non-significant as reported in the main ES.
- 5.3.246 For further information see SES2 and AP2 ES Volume 5: Appendix LV-001-004.

Hey Sprink Ancient Redlands and Woodlands LCA

- 5.3.247 The main ES reported a moderate adverse significant effect at year 1 reducing to non-significant at year 15 and year 60. This was due to the substantial changes to the western edge of the LCA from the presence of the porous portals at either end of the Whitmore Heath tunnel, Whitmore North cutting and Whitmore Wood retaining wall. The character of the rural landscape in terms of both landform and pattern of land cover would substantially change. The Whitmore North cutting would physically and visually divide Whitmore Wood. The closure of Snape Hall Road, together with the presence of the new infrastructure, would change the character of the landscape on the north-western edge of Whitmore Heath. By year 15, the mitigation planting would be maturing and the porous portal and other infrastructure would become integrated into the surrounding landscape. The effects would therefore reduce to non-significant.
- 5.3.248 At year 1, the replacement of Whitmore Wood overbridge and its associated bridge embankments by Whitmore Wood underbridge will slightly reduce the effect on the landscape character of the LCA as the underbridge will be a less prominent feature. The effects of the amendment will, however, be localised and will not affect the wider landscape character of Hey Sprink Ancient Redlands and Woodlands LCA, which will continue to be affected by the presence of the porous portals at either end of the Whitmore Heath tunnel, Whitmore North cutting and Whitmore Wood retaining wall and closure of Snape Hall Road. The amendment will therefore not give rise to a new or different significant effect and will not change the level of significance of the effect

reported in the main ES. At year 15 and year 60, the level of significance of the effect will remain non-significant as reported in the main ES.

For further information see SES2 and AP2 ES Volume 5: Appendix LV-001-004 and SES2 and AP2 ES Volume 5: Landscape and visual Map Book.

Visual assessment

View north-east from farmland close to WCML (viewpoint 020.03.011)

5.3.249 The main ES reported a major adverse significant effect at year 1, year 15 and year 60 of operation. This was due to the prominence of the Meece Brook viaduct and Meece embankment, overhead line equipment and moving trains. Whilst the lower sections of these features would in places be screened by new landscape earthworks, the upper sections, and particularly Meece Brook viaduct, would be prominent within the landscape and substantially change the outlook across the Meece Brook valley. Even with the maturing of mitigation planting, the effects on views and level of severance from the presence of the Meece Brook viaduct would remain.

5.3.250 At year 1, year 15 and year 60, the amendment to change the vertical and horizontal alignment will result in Meece Brook viaduct being reduced in height by 2.2m, with a consequent reduction in the height of Meece embankment by up to 3.3m. Both the viaduct and the embankment will be slightly less prominent in the view which will improve the outlook from this viewpoint compared to the original scheme. Nevertheless, the view will still be very different from that currently experienced and the sense of severance and reduction in scenic quality will remain. The amendment will therefore give rise to a different significant effect. However, the level of significance of the effect will remain major adverse significant as reported in the main ES.

For further information see SES2 and AP2 ES Volume 5: Appendix LV-001-004 and SES2 and AP2 ES Volume 5: Landscape and visual Map Book.

View north from junction of farmland near Baldwin's Gate (viewpoints 020.03.010 and 020.03.022)

5.3.251 The main ES reported a moderate adverse significant effect at year 1, reducing to non-significant at year 15. This was due to the prominence of Meece Brook viaduct and Meece embankment, overhead line equipment and moving trains. Whilst the lower parts of these features would in places be screened by new landscape earthworks, the upper parts and particularly Meece Brook viaduct, would be very noticeable and substantially change the view across Meece Brook valley. The new A53 Newcastle Road overbridge would also be distantly visible. However, by year 15, the maturing of mitigation planting would integrate the new structures and operational railway into the wider landscape and the effects on views would reduce.

5.3.252 At year 1, the amendment to change the vertical and horizontal alignment will result in Meece Brook viaduct being reduced in height by 2.2m, with a consequent reduction in the height of Meece embankment by up to 3.3 m. Both the viaduct and the embankment will be slightly less prominent in the view. The A53 Newcastle Road overbridge will not be constructed, which will reduce the effect of the amendment on distant views, compared to the original scheme. Overall there will be a slight

improvement in the view compared to the original scheme, although the outlook will still be very different from that currently experienced. The sense of severance and reduction in scenic quality will also remain. The amendment will therefore give rise to a different significant effect. However, the level of significance of the effect will remain moderate adverse significant as reported in the main ES. At year 15 and year 60, the level of significance of the effect will remain non-significant as reported in the main ES.

For further information see SES2 and AP2 ES Volume 5: Appendix LV-001-004 and SES2 and AP2 ES Volume 5: Landscape and visual Map Book.

View east from the A53 Newcastle Road near The Hill (viewpoint 020.02.021)

5.3.253 The main ES reported a major adverse significant effect at year 1, reducing to non-significant at year 15. This was due mostly to the presence of the A53 Newcastle Road overbridge and passing vehicles at elevation close to the viewpoint. Fencing around the southern porous portal of Whitmore Heath tunnel would be visible but not prominent. The new structures and reconfigured landform, combined with the loss of landscape features including the road landscape, hedgerows and mature trees, would substantially change the outlook. By year 15, however, the original scheme would become less apparent in the view, as the maturing mitigation planting around the porous portal and Whitmore South cutting would achieve some screening and integration of these features within the surrounding landscape.

5.3.254 At year 1, the amendment to change the vertical and horizontal alignment will relocate the southern porous portal of the Whitmore Heath tunnel and associated infrastructure approximately 180m to the south along the HS2 route, and remove the requirement for the proposed A53 Newcastle Road overbridge. This will change the level of significance of the effect reported in the main ES, from major adverse significant to negligible non-significant. The amendment will therefore remove the major adverse significant effect reported in the main ES. At year 15 and year 60, the level of significance of the effect will remain non-significant as reported in the main ES.

For further information see SES2 and AP2 ES Volume 5: Appendix LV-001-004 and SES2 and AP2 ES Volume 5: Landscape and visual Map Book.

View south-west from Rectory Lane (viewpoint 020.02.016)

5.3.255 The main ES reported a moderate adverse significant effect at year 1 reducing to non-significant at year 15. This was due mostly to the presence of the A53 Newcastle Road overbridge and passing vehicles at elevation. The presence of the new overbridge and associated road embankments, changes to the Meece Brook valley landform, and loss of landscape features, including hedgerows, trees and fields would change the outlook, particularly in winter when views are more open. In the summer of year 1, views would be more filtered and screened by foliage on intervening vegetation and users of footpaths would have only very glimpsed views. By year 15, the maturing mitigation planting around the A53 Newcastle Road overbridge would screen views and integrate the new features within the surrounding landscape.

5.3.256 At year 1, the amendment to change the vertical and horizontal alignment will relocate the southern porous portal of Whitmore Heath tunnel and associated

infrastructure approximately 180m to the south along the HS2 route. It will also remove the requirement for the proposed A53 Newcastle Road overbridge. This will change the level of significance of the effect reported in the main ES, from moderate adverse significant to negligible non-significant. The amendment will therefore remove the moderate adverse significant effect reported in the main ES. At year 15 and year 60, the level of significance of the effect will remain non-significant as reported in the main ES.

For further information see SES2 and AP2 ES Volume 5: Appendix LV-001-004 and SES2 and AP2 ES Volume 5: Landscape and visual Map Book.

View east from farmland near the edge of Madeley Park Wood (viewpoints 021.02.005, 021.02.007 and 021.02.008)

- 5.3.257 The main ES reported a major adverse significant effect at year 1, reducing to moderate adverse significant at year 15 and non-significant at year 60. This was due to the prominence of various elements of the original scheme, including the northern porous portal of the Whitmore Heath tunnel, a pumping station, tunnel portal building, Whitmore North cutting, Whitmore Wood retaining wall, Whitmore Wood overbridge, noise fence barriers and overhead line equipment. To the north, the upper parts of the overhead line equipment and moving trains would be visible above a noise fence barrier situated on the top of the Lea South embankment and River Lea viaduct. The new structures and landform would be prominent landscape features and, combined with the loss of hedgerows, mature trees and a section of Whitmore Wood, would substantially change the rural outlook across the River Lea valley. By year 15, the maturing mitigation planting would provide some screening and integration of components of the original scheme described above within the wider landscape thereby reducing its effect.
- 5.3.258 At year 1, the amendment to change the vertical and horizontal alignment includes a number of proposals which together affect these viewpoints. These include realigning the HS2 route approximately 10m closer to the viewpoint and replacing Whitmore Wood overbridge with the Whitmore underbridge. Overall, views will be slightly improved compared to the original scheme, mainly through the removal of Whitmore Wood overbridge. The components of the original scheme listed above will continue to affect the view as described in the main ES. The amendment will therefore give rise to a different significant effect. However, the level of significance of the effect will remain major adverse significant as reported in the main ES.
- 5.3.259 At year 15, the maturing mitigation planting along the eastern side of the River Lea valley will achieve some screening and integration of the operational railway into the surrounding landscape. Although the view will be improved through the removal of Whitmore Wood overbridge from the scheme, it will still be affected by severance of Whitmore Wood by the HS2 route. The amendment will therefore give rise to a different significant effect. However, the level of significance of the effect will remain moderate adverse significant as reported in the main ES. At year 60, the level of significance of the effect will remain non-significant as reported in the main ES.
- 5.3.260 For further information see SES2 and AP2 ES Volume 5: Appendix LV-001-004 and SES2 and AP2 ES Volume 5: Landscape and visual Map Book.

- 5.3.261 The view of the amendment from viewpoint 021.02.005 during operation Year 1 and Year 15 is illustrated on the photomontages shown in Figure LV-01-552 and LV-01-666 (Volume 5: Appendix LV-001-004).

View north-east from Manor Road (viewpoint 021.03.013 and Viewpoint 022.02.001)

- 5.3.262 The main ES reported a major adverse significant effect at year 1, reducing to moderate adverse at year 15 and year 60. This was due to the prominence of the operational railway as it crosses the River Lea valley on the Lea South embankment and River Lea viaduct, albeit that it would be seen in the context of the WCML. The presence of prominent new skyline features, combined with the loss of vegetation, would substantially change the rural outlook and obscure some views of Hey Sprink Ancient Woodland and the shaws on the opposite valley side. By year 15, the embankment would become less apparent in the view as the maturing mitigation planting would partially screen views and provide some integration of the new landform and operational railway within the landscape. The Meece Brook viaduct would remain a very noticeable feature within the landscape.
- 5.3.263 At year 1, the amendment to change the vertical and horizontal alignment will realign the Lea South embankment and River Lea viaduct approximately 10m to the south-west. This will require the relocation of the Whitmore North auto-transformer station to the south-east, leading to a reconfiguration of the landscape earthworks and landscape mitigation planting to suit the new HS2 route alignment and earthworks. These changes will, however, be minimal given the scale of the wider effects experienced at these viewpoints and prominence of the Meece Brook viaduct. The amendment will therefore not give rise to a new or different significant effect and will not change the level of significance of the effects reported in the main ES.
- 5.3.264 At year 15 and year 60, the maturing mitigation planting associated with the amendment will achieve a similar level of screening and integration of the operational railway within the surrounding landscape. The amendment will therefore not give rise to a new or different significant effect and will not change the level of significance of the effect reported in the main ES. At year 60, the level of significance of the effect will remain moderate adverse significant as reported in the main ES.

For further information see SES2 and AP2 ES Volume 5: Appendix LV-001-004 and SES2 and AP2 ES Volume 5: Landscape and visual Map Book.

View south-west from Madeley Parish Cemetery (viewpoint 022.03.024)

- 5.3.265 The main ES reported a major adverse effect at year 1, year 15 and year 60. This was due to the prominence of Lea North embankment and Manor Road overbridge, together with the associated embankments and views of moving trains, overhead line equipment and moving vehicles. There would be a loss of landscape features, mature trees and hedgerows, and substantial change to the local landform. Noise from trains and vehicles on the Manor Road overbridge would disturb the tranquillity of the cemetery. By year 15, despite the presence of maturing mitigation planting, Manor Road overbridge would remain a prominent feature.
- 5.3.266 At year 1, year 15 and year 60, the amendment to change the vertical and horizontal alignment will result in Manor Road increasing in height by approximately 1m and the

embankment footprint widening by up to 5m. As a result, Manor Road overbridge and its associated embankments will be slightly closer to the viewpoint, which will further increase their prominence. The amendment will therefore give rise to a different significant effect. However, the level of significance of the effect will remain major adverse significant as reported in the main ES.

- 5.3.267 The view of the amendment from viewpoint 022.03.024 during operation Year 15 is illustrated on the photomontage shown in Figure LV-01-645 (Volume 5: Appendix LV-001-004).

For further information see SES2 and AP2 ES Volume 5: Appendix LV-001-004 and SES2 and AP2 ES Volume 5: Landscape and visual Map Book.

Mitigation and residual effects

Other mitigation measures

- 5.3.268 No mitigation measures, additional to those identified in the main ES, are identified.

Summary of likely residual significant effects

- 5.3.269 The amendment to change the vertical and horizontal alignment will give rise to different significant operational effects at the following viewpoints. However, this will not change the level of significance of the effect reported in the main ES:

- view north-east from farmland close to WCML (viewpoint 020.03.011) – the effect will reduce but will remain major adverse significant at year 15 and year 60;
- view east from farmland near Snape Hall Farm (viewpoint 021.02.005) – the effect will reduce but will remain moderate adverse significant at year 15;
- view north-east from farmland east of Madeley Park Farm (021.02.007) – the effect will reduce but will remain moderate adverse significant at year 15;
- view north-east from edge of Madeley Park Wood (viewpoint 021.02.008) – the effect will reduce but will remain moderate adverse significant at year 15; and
- view south-west from Madeley Parish Cemetery (viewpoint 022.03.024) – the effect will increase but will remain major adverse significant at year 15 and year 60.

Cumulative effects

- 5.3.270 There are no new or different likely significant cumulative effects for landscape and visual as a result of the amendment acting in combination with any other AP2 amendments.

Monitoring

- 5.3.271 Volume 1 of the main ES sets out the general approach to environmental monitoring during operation of the original scheme.

- 5.3.272 There are no changes to the monitoring requirements identified in the main ES for landscape and visual as a result of the amendment.

Sound, noise and vibration

Scope, assumptions and limitations

- 5.3.273 The assessment scope, key assumptions and limitations for sound, noise and vibration are as set out in Volume 1 and the SMR of the main ES.
- 5.3.274 This amendment has the potential to result in new or different significant construction and operational effects for sound, noise and vibration. Therefore, both construction and operational effects are considered in this assessment.

Existing environmental baseline

- 5.3.275 The baseline sound and vibration information for the Whitmore Heath to Madeley area is as described in Volume 2, CA4, Section 13 of the main ES. Baseline sound levels representative of the assessment locations affected by the amendment have been used in the construction and operational assessment.
- 5.3.276 The area close to the amendment includes the residential communities of Whitmore, Madeley Park Wood and Bar Hill, and Hey House (including Edland Kennels/Cattery) and Madeley Cemetery.

Future environmental baseline

Construction (2020) and operation (2027)

- 5.3.277 The future baseline for construction in 2020 and operation in 2027 remains unchanged from that reported in the main ES Volume 5: Appendix CT-004-000.

Effects arising during construction

Avoidance and mitigation measures

- 5.3.278 No avoidance or mitigation measures additional to those reported in the main ES and draft CoCP are identified.

Assessment of impacts and effects

- 5.3.279 In the area close to the amendment, SES2 identified a likely significant effect on a community basis due to construction noise at approximately 15 dwellings in Whitmore Heath in the vicinity of Snape Hall Road for a period of up to four years and eight months. An assessment has been undertaken to determine whether the construction noise or vibration levels as a result of the amendment, will result in a new or different likely significant effect, using the significance criteria detailed in the main ES (Volume 5: Appendix SV-001-000).
- 5.3.280 The assessment has considered the construction noise and vibration levels associated with the amendment and those identified in the SES2, the construction programme for the amendment and local mitigation identified in the main ES. The amendment will not give rise to any new or different likely residual significant effects compared to those reported in the SES2. For further information, see SES2 and AP2 ES Volume 5: Appendix SV-002-000.

Cumulative effects

- 5.3.281 There are no new or different likely significant cumulative effects for sound, noise and vibration as a result of the amendment acting in-combination with any other AP2 amendments.

Effects arising from operation

Avoidance and mitigation measures

- 5.3.282 No avoidance or mitigation measures additional to those reported in the main ES are identified.

Assessment of impacts and effects

Airborne noise

- 5.3.283 The main ES identified major, moderate and minor adverse airborne noise effects on the acoustic character of the residential area within the residential community of Whitmore Heath; specifically, approximately 10 dwellings in the vicinity of Snape Hall Road and Birch Tree Lane, which are considered to be significant on a community basis. The community is identified as reference OSVo4-Co3 on Map Series SV-05 in the Volume 2, CA4 Map Book of the main ES.
- 5.3.284 The main ES also identified a potential likely significant airborne noise effect at Hey House offices, associated with Edland Kennels/Cattery, and Madeley Cemetery.
- 5.3.285 An assessment has been undertaken to determine whether the operational airborne noise levels, as a result of the amendment, will result in a new or different likely significant effect using the significance criteria detailed in the main ES (Volume 5: Appendix SV-001-000). The predicted operational sound and vibration levels as a result of the amendment are presented in the SES2 and AP2 ES (Volume 5: Appendix SV-001-000).
- 5.3.286 The amendment, in particular the reduction in the track separation, marginally improves the effectiveness of the noise mitigation identified in the main ES at Hey House, Madeley Cemetery and the properties within the community of Madeley Park Wood, however, no new or different likely significant operational airborne noise effects are identified.

Ground-borne noise and vibration

- 5.3.287 The main ES identified three properties above the proposed Whitmore Heath tunnel where the predicted ground-borne noise levels are greater than the significant observed adverse effect level (SOAEL) identified in the SMR of the main ES (Volume 5: Appendix CT-001-001 of the main ES). These buildings, which are indicated on map series SV-04, Volume 5: Sound, noise and vibration Map Book of the main ES are:
- The Brackens, Heath Road, Whitmore Heath (assessment location ref.:14241);
 - West Ridge, Birch Tree Lane, Whitmore Heath (assessment location ref.: 14074); and
 - Wyndways, Heath Lane, Whitmore Heath (assessment location ref.: 14056).

- 5.3.288 The main ES also identified major and moderate adverse ground-borne noise effects on the acoustic character inside properties within the residential community of Whitmore Heath; specifically, approximately 10 dwellings in the vicinity of Heath Road, Birch Tree Lane and Heath Rise, which are considered to be significant on a community basis. The community is identified as reference OSVo₄-Co₂ on Map Series SV-05 (main ES Volume 2, CA₄ Map Book).
- 5.3.289 An assessment has been undertaken to determine whether the operational ground-borne noise and vibration levels, as a result of the amendment, will result in a new or different likely significant effect, using the significance criteria detailed in the main ES (Volume 5: Appendix SV-001-000). The predicted operational sound and vibration levels as a result of the amendment are presented in the SES2 and AP2 ES (Volume 5: Appendix SV-001-000).
- 5.3.290 The amendment lowers the alignment of Whitmore Heath tunnel which increases the distance from the tunnel to the properties on Whitmore Heath. The additional attenuation that this provides reduces the ground-borne noise levels such that the predicted levels at The Brackens, West Ridge and Wyndways are reduced below the SOAEL, therefore removing the likely significant effect identified at these individual properties.
- 5.3.291 The reduction in the ground-borne noise levels reduces the number of major and moderate effects at approximately 10 properties in Whitmore Heath, in the vicinity of Heath Road, Birch Tree Lane and Heath Rise such that the likely significant community ground-borne noise and vibration effect, reference OSVo₄-Co₂, is removed.

Mitigation and residual effects

Other mitigation measures

- 5.3.292 No mitigation measures additional to those reported in the main ES are required.

Summary of likely residual significant effects

- 5.3.293 The amendment will remove the likely residual significant operational ground-borne noise effect on an individual basis at The Brackens, West Ridge and Wyndways, and the likely significant operational ground-borne noise effect on a community basis at approximately 10 properties in Whitmore Heath, in the vicinity of Heath Road, Birch Tree Lane and Heath Rise.

Cumulative effects

- 5.3.294 There are no new or different likely significant cumulative effects for sound, noise and vibration as a result of this amendment acting in combination with any other AP2 amendments.

Monitoring

- 5.3.295 Volume 1 of the main ES sets out the general approach to environmental monitoring during operation of the original scheme.
- 5.3.296 There are no changes to the monitoring requirements identified in the main ES for sound, noise and vibration as a result of the amendment.

Traffic and transport

Scope, assumptions and limitations

- 5.3.297 The assessment scope, key assumptions and limitations for traffic and transport are as set out in Volume 1, the SMR and SMR Addendum of the main ES.
- 5.3.298 This amendment has the potential to result in new or different significant construction effects only. Therefore, there is no operational assessment for traffic and transport.
- 5.3.299 The assessment of the changes to construction traffic flows as a result of this amendment in combination with all SES2 changes and AP2 amendments is reported in Section 7.

Existing environmental baseline

- 5.3.300 The baseline traffic and transport information for the Whitmore Heath to Madeley area is as described in Volume 2 CA4, Section 14 of the main ES.
- 5.3.301 The A53 Newcastle Road/Whitmore Road, which passes through Baldwin's Gate and Whitmore is a primary 'A' road in the Whitmore Heath to Madeley area. The local road network in this area generally operates well although some localised delays can be experienced particularly at peak times where local roads meet the main road network.

Future environmental baseline

Construction (2023)

- 5.3.302 The future baseline for construction in 2023 remains unchanged from that reported in the main ES Volume 5: Appendix CT-004-000.

Effects arising during construction

Avoidance and mitigation measures

- 5.3.303 No avoidance or mitigation measures additional to those reported in the main ES and draft CoCP are required.

Assessment of impacts and effects

- 5.3.304 The main ES reported that the A53 Newcastle Road would be diverted temporarily in order to facilitate the construction of the Whitmore Heath cut and cover tunnel. On completion of the Whitmore Heath cut and cover tunnel the A53 Newcastle Road would be reinstated on its existing alignment. The diversion would be required for approximately one year and three months. No significant effect on traffic flows and delays for vehicle occupants as a result of the diversion was reported in the main ES. The main ES further reported that the diversion of the A53 Newcastle Road would require the diversion of an existing bus service on the A53 Newcastle Road. However, no significant effect on journey time and distance was reported. The main ES did, however, report a minor temporary adverse significant effect on non-motorised users as a result of severance from an increase in travel distance of up to 150m.
- 5.3.305 The amendment will remove the need to temporarily divert the A53 Newcastle Road and, therefore, will remove the temporary minor adverse significant severance effect on non-motorised users of the A53 Newcastle Road, as reported in the main ES.

- 5.3.306 For further information see the SES2 and AP2 ES Volume 5: Traffic and transport Map Book.

Mitigation and residual effects

Other mitigation measures

- 5.3.307 No mitigation measures, additional to those reported in the main ES and draft CoCP, are required.

Summary of likely residual significant effects

- 5.3.308 The amendment will remove the need to temporarily divert the A53 Newcastle Road and, therefore, will remove the likely residual significant temporary minor adverse severance effect on non-motorised users of the A53 Newcastle Road reported in the main ES.

Cumulative effects

- 5.3.309 There are no new or different likely significant cumulative effects for traffic and transport as a result of the amendment acting in combination with any other AP2 amendments or any relevant committed development.

Water resources and flood risk

Scope, assumptions and limitations

- 5.3.310 The assessment scope, key assumptions and limitations for water resources and flood risk are as set out in Volume 1, the SMR and SMR Addendum of the main ES and SMR Addendum 2 (see SES2 and AP2 ES Volume 5: Appendix CT-001-000).
- 5.3.311 This amendment has the potential to result in new or different construction effects only. Therefore, there is no operational assessment for water resources and flood risk.

Existing environmental baseline

- 5.3.312 The baseline water resources information for the Whitmore Heath to Madeley area is as described in Volume 2, CA4, Section 15 of the main ES. Further details relating to water resources and flood risk for this area are provided in Volume 5: Appendix WR-002-004 and Appendix WR-003-004 and the main ES Volume 5 Water resources and flood risk Map Book.
- 5.3.313 This amendment is located within areas of source protection zone 1 (SPZ1) associated with the public groundwater supply abstraction near Whitmore, which is a very high value receptor. It is also directly adjacent to Meece Brook, which is a high value receptor. It will involve construction activities of a nature and scale that have potential water quality implications.

Future environmental baseline

Construction (2020)

- 5.3.314 The future baseline for construction in 2020 remains unchanged from that reported in the main ES Volume 5: Appendix CT-004-000.

Effects arising from construction

- 5.3.315 The main ES reported a major adverse temporary significant effect associated with impacts on the licensed public groundwater abstraction near Whitmore. The amendment will result in increased construction activity in the vicinity of this abstraction. Mitigation is being discussed with the owner and the Environment Agency, with a view to ensuring a continuous, resilient water supply during the construction period. Such mitigation options may include the temporary suspension of abstraction at this location. Options to mitigate this temporary loss of water supply may include:
- increasing existing outputs of alternative potential water supplies, for example, by enhancing treatment of other supplies;
 - importing water from another source unaffected by construction of the scheme;
 - provision of replacement borehole sources; and
 - initiatives to reduce the quantity of water required, for example, reducing consumption in the zone.
- 5.3.316 With these measures in place the amendment will not give rise to a new or different significant effect and will not change the level of significance of the effects reported in the main ES.
- 5.3.317 The main ES reported no significant effects on surface water quality due to site runoff and increased pollution risk in the vicinity of this amendment. The amendment has the potential to give rise to temporary adverse impacts on surface water quality which could affect the water environment. However, the amendment will be constructed in accordance with the measures specifically designed to safeguard water resources outlined in the draft CoCP. Therefore, the amendment will not give rise to a new or different significant effect and will not change the level of significance of the effects reported in the main ES.

Cumulative effects

- 5.3.318 There are no new or different likely significant cumulative effects for water resources and flood risk as a result of the amendment acting in combination with any other AP2 amendments.

Summary of new or different likely residual significant effects as a result of the amendment

- 5.3.319 The likely residual significant temporary and permanent agricultural moderate adverse effect on Rose Cottage (CA4/3) will be removed by the amendment, as land is no longer required temporarily or permanently from the land holding.
- 5.3.320 The amendment will give rise to a different likely residual significant temporary in-combination effect on properties in Whitmore and Whitmore Heath as the number of properties subject to noise and visual effects will reduce. However, this will not change the level of significance reported in the main ES as amended by SES1.

- 5.3.321 The likely residual significant adverse effect on four assumed veteran trees will be removed by the amendment due to a reduction in land required for construction. The amendment will reduce the loss of ancient woodland from Whitmore Wood and Hey Sprink (wood south-west of) which will give rise to a different likely residual significant effect. However, this will not change the level of significance reported in the main ES. In the area subject to the amendment there will be an increase in hedgerow habitat creation to be provided which will give rise to a different significant effect. However, due to the extent of hedgerow loss across the Whitmore to Madeley area this will not change the level of significance reported in the main ES, as amended by SES1.
- 5.3.322 The amendment will remove the likely residual significant construction effects at viewpoints 020.02.021 and 020.02.016. The amendment will give rise to different likely residual significant construction effect at viewpoints 021.02.005, 021.02.007, 021.02.008, and 022.03.024. However, the significant effect at these viewpoints will remain as reported in the main ES. The amendment will also give rise to different likely residual significant operation effects at viewpoints 020.03.011, 021.02.005, 021.02.007, 021.02.008 and 022.03.024. However, the significant effect at these viewpoints will remain as reported in the main ES.
- 5.3.323 The likely residual significant ground-borne noise operational effect on an individual basis at The Brackens, West Ridge and Wyndways, and on a community basis at approximately 10 properties in Whitmore Heath (Heath Road, Birch Tree Lane and Heath Rise) will be removed by the amendment as the alignment of the Whitmore Tunnel is lowered.
- 5.3.324 The likely residual significant effect on non-motorised users of the A53 Newcastle Road during construction will be removed by the amendment, as there is no longer a need to temporarily divert the A53 Newcastle Road.

5.4 Additional land required and a change to Bill powers for modifications to the A51 Stone Road/Nantwich Road/A53 Newcastle Road junction (AP2-004-003)

- 5.4.1 The Bill provides for a temporary construction traffic route between the HS2 route at Baldwin's Gate and the A51 Stone Road/Nantwich Road to the south-west, via the A53 Newcastle Road. Construction traffic would enter onto the A53 Newcastle Road at Baldwin's Gate and travel south to join the A51 Stone Road.
- 5.4.2 Since submission of the Bill, it has been identified that there is a need to reduce the queuing and delays through the staggered crossroads junction of the A51 Stone Road/Nantwich Road and the A53 Newcastle Road. To improve junction capacity, localised modifications will be provided in the form of signalisation of the two adjacent junctions of the A51 Stone Road/Nantwich Road and the A53 Newcastle Road. The traffic signals will allow safe turning manoeuvres in to and out of the A51 Stone Road. See Map CT-05-230-L3, D5 to D6, in the SES2 and AP2 ES Volume 2, CA4 Map Book.
- 5.4.3 The A53 Newcastle Road will be diverted over a length of 250m to form a new junction between the A53 Newcastle Road and A51 Nantwich Road, approximately 80m east of the existing junction. Traffic signals will be provided on both A53 Newcastle Road junctions with the A51 Nantwich Road/Stone Road to create a new signal controlled

staggered junction. Hedgerow habitat creation will be provided along both sides of the realigned A53 Newcastle Road, and approximately 0.1ha of woodland habitat creation will be provided within and adjacent to the existing boundary of The Bogs Local Wildlife Site (LWS).

- 5.4.4 Where the A53 Newcastle Road is diverted, a section of the existing road will be retained to maintain access to properties adjacent to the existing A53/A51 junction. A turning head will be provided at the end of the existing A53 Newcastle Road and a new junction formed on the A53 Newcastle Road realignment to provide a connection to the existing A53 Newcastle Road. To accommodate the traffic signals at both junctions, a permanent speed limit reduction will be required on approaches to the junctions and through the junctions. See Map CT-05-230-L3, D5 to B9 in the SES2 and AP2 ES Volume 2, CA4 Map Book.
- 5.4.5 The amendment will be constructed over a period of six months, commencing in 2020. Works will be managed from the A51/A53 junction modifications satellite compound.
- 5.4.6 The installation of traffic signals is outside the limits of the Bill and will require a change to Bill powers. The permanent junction modifications and the diversion of the A53 Newcastle Road is outside the limits of the Bill and will result in the requirement for an additional 2.2ha of land, some of which will be from Swan Inn Farm (CA4/22). See Map CT-05-230-L3, D5 to B9, and Map CT-06-230-L3, D5 to B9, in the SES2 and AP2 ES Volume 2, CA4 Map Book. It is assumed that 1ha of the additional land will be returned to its existing use following construction, and the remainder of the additional land will be maintained permanently following construction.

Topics included in the AP2 assessment

- 5.4.7 This amendment is considered to require reassessment of the environmental effects and mitigation in the main ES as amended by SES1 and SES2, for the following topics: agriculture, soils and forestry; air quality; cultural heritage; ecology and biodiversity; landscape and visual; traffic and transport and water resources and flood risk.
- 5.4.8 The assessment of the changes to construction traffic flows and traffic related effects as a result of this AP2 amendment in combination with all SES2 changes and AP2 amendments, is reported in Section 7.

Agriculture, forestry and soils

Scope, assumptions and limitations

- 5.4.9 The assessment scope, key assumptions and limitations for agriculture, forestry and soils are as set out in Volume 1, the Scope and Methodology Report³⁵ (SMR) and SMR Addendum³⁶ of the main ES.

³⁵ HS2 Ltd (2017). *High Speed Rail (West Midlands - Crewe) Environmental Statement*, Volume 5: Technical appendices, Environmental Impact Assessment Scope and Methodology Report (Appendix CT-001-001). Available online at: <https://www.gov.uk/government/publications/scope-and-methodology-report-for-hs2-phase-2a>

³⁶ HS2 Ltd (2017). *High Speed Rail (West Midlands - Crewe) Environmental Statement*, Volume 5: Technical appendices, Environmental Impact Assessment Scope and Methodology Report Addendum (Appendix CT-001-002). Available online at: <https://www.gov.uk/government/publications/scope-and-methodology-report-for-hs2-phase-2a>

- 5.4.10 This amendment has the potential to result in new or different significant construction effects only. Therefore, there is no operational assessment for agriculture, forestry and soils.

Existing environmental baseline

- 5.4.11 The baseline agriculture, forestry and soils information for the Whitmore Heath to Madeley area is as described in Volume 2, CA4, Section 4 of the main ES.
- 5.4.12 The area of land required for the amendment has soils predominantly in the Bridgnorth association, as described in Volume 2, CA4, Section 4 of the main ES. Bridgnorth association comprises of well drained sandy and coarse loamy soils over soft sandstone. This land is classified as very good quality land in Grade 2³⁷.
- 5.4.13 There are peaty soils found on the adjacent low-lying woodland in the Isleham 2 and Altcar 1 associations. Isleham 2 soils are deep, permeable sandy and peaty soils affected by groundwater over drift or peat. Altcar 1 soils are deep peat soils with earthy topsoils affected by groundwater.
- 5.4.14 One farm holding will be newly affected by this amendment. Swan Inn Farm (CA4/22) is farmed in association with Lunts Farm, Aston and is a 360ha dairy, beef and arable holding. Swan Inn Farm is the arable base and is of medium sensitivity to change.

Future environmental baseline

Construction (2020)

- 5.4.15 The future baseline for construction in 2020 remains unchanged from that reported in the main ES Volume 5: Appendix CT-004-000.

Effects arising during construction

Avoidance and mitigation measures

- 5.4.16 No avoidance or mitigation measures, additional to those identified in the main ES and draft Code of Construction Practice (CoCP)³⁸, are required.

Assessment of impacts and effects

- 5.4.17 The amendment will not give rise to a new or different significant effect and will not change the level of significance of the effects reported in the main ES on best and most versatile (BMV) agricultural land or forestry land within the Whitmore Heath to Madeley area as it is not of a scale to change the magnitude of impact. The route-wide effects on BMV land and forestry land are reported in Volume 3 of the SES2 and AP2 ES.

³⁷ The quality of agricultural land in England and Wales is assessed according to the Agricultural Land Classification (ALC) system, which classifies agricultural land into five grades from excellent quality Grade 1 land to very poor quality Grade 5 land. Grade 3 is subdivided into Subgrades 3a and 3b. Grades 1, 2 and 3a are defined as the best and most versatile (BMV) land. The ALC methodology is contained in:

Ministry of Agriculture, Fisheries and Food (1988). Agricultural Land Classification of England and Wales – *Revised guidelines and criteria for grading the quality of agricultural land*. Available online at: <http://publications.naturalengland.org.uk/publication/625705062026448>

³⁸ S2 Ltd (2017). *High Speed Rail (West Midlands - Crewe) Environmental Statement*, Volume 5: Technical appendices, draft Code of Construction Practice (CT-003-000). Available online at <https://www.gov.uk/government/publications/draft-code-of-construction-practice-for-hs2-phase-2a>

- 5.4.18 Swan Inn Farm (CA4/22) was not reported in the main ES as it was outside the land required for the original scheme. The amendment will require 1.2ha of land temporarily and permanently from the land holding (0.3% of the total area of the land holding), which is a negligible impact. The amendment will give rise to a new negligible temporary and permanent effect, which is not significant, on this land holding.
- 5.4.19 For further information see SES2 and AP2 ES Volume 5: Appendix AG-001-000 and SES2 and AP2 ES Volume 5: Agriculture, forestry and soils Map Book.

Cumulative effects

- 5.4.20 There are no new or different likely significant cumulative effects for agriculture, forestry and soils as a result of the amendment acting in combination with any other AP2 amendments.

Air quality

Scope, assumptions and limitations

- 5.4.21 The assessment scope, key assumptions and limitations for air quality are as set out in Volume 1, the SMR and SMR Addendum of the main ES.
- 5.4.22 This amendment has the potential to result in new or different significant construction effects only. Therefore, there is no operational assessment for air quality. This section only considers effects from construction dust. Any air quality effects from construction traffic are reported in Section 7.

Existing environmental baseline

- 5.4.23 The baseline air quality information for the Whitmore Heath to Madeley area is as described in Volume 2, CA4, Section 5 of the main ES. The updated background pollutant concentrations from the Department for Environment, Food and Rural Affairs (Defra) have only minor changes compared to the information used in the main ES.

Future environmental baseline

Construction (2020)

- 5.4.24 The future committed development baseline for construction in 2020 remains unchanged from that reported in the main ES Volume 5: Appendix CT-004-000.
- 5.4.25 The updated background pollutant concentrations from Defra for 2020 have only minor changes compared to the information used in the main ES.

Effects arising during construction

Avoidance and mitigation measures

- 5.4.26 No avoidance or mitigation measures, additional to those reported in the main ES and draft CoCP, are identified.

Assessment of impacts and effects

- 5.4.27 The main ES reported no significant effects on air quality from dust generating activities in this area. With the application of the mitigation measures, as set out in the draft CoCP, no significant effects are anticipated from dust generating activities associated with this amendment. Therefore, this amendment will not give rise to any new or different likely residual significant effects and will not change the level of significance of the effects reported in the main ES. For further information see SES2 and AP2 ES Volume 5: Appendix AQ-001-004.

Cumulative effects

- 5.4.28 There are no new or different likely significant cumulative effects for air quality as a result of the amendment acting in-combination with any other AP2 amendments.

Cultural heritage

Scope, assumptions and limitations

- 5.4.29 The assessment scope, key assumptions and limitations for cultural heritage are as set out in Volume 1, the SMR and SMR Addendum of the main ES and SMR Addendum 2 (see SES2 and AP2 ES Volume 5: Appendix CT-001-000).
- 5.4.30 As the cultural heritage impacts of the amendment are not reversible, they therefore have the potential to result in new or different significant permanent construction effects only. There is no temporary construction or operational assessment for cultural heritage.

Existing environmental baseline

- 5.4.31 The baseline cultural heritage information for the Whitmore Heath to Madeley area is as described in Volume 2, CA4, Section 7 of the main ES.
- 5.4.32 A Grade II listed milepost on the A51 Stone Road, 2.5km west of Baldwin's Gate (WHM108), a designated asset of moderate value, lies wholly within the land required for the amendment. This asset was not reported in the main ES as it was outside the study area of the original scheme.
- 5.4.33 Further information about this asset is provided in the SES2 and AP2 ES Volume 5: Appendix CH-002-000 and the SES2 and AP2 ES Volume 5: Cultural heritage Map Book.

Future environmental baseline

Construction (2020)

- 5.4.34 The future baseline for construction in 2020 remains unchanged from that reported in the main ES Volume 5: Appendix CT-004-000.

Effects arising during construction

Avoidance and mitigation measures

- 5.4.35 No avoidance or mitigation measures additional to those reported in the main ES and draft CoCP are identified.

Assessment of impacts and effects

- 5.4.36 A Grade II listed milepost on the A51 Stone Road, 2.5km west of Baldwin's Gate (WHM108), a designated asset of moderate value, will be completely removed during construction of the amendment. This will give rise to a new permanent high adverse impact and a new permanent major adverse effect, which is significant.
- 5.4.37 For further information see the SES2 and AP2 ES Volume 5: Cultural heritage Map Book and the SES2 and AP2 ES Volume 5: Appendix CH-003-000.

Mitigation and residual effects

Other mitigation measures

- 5.4.38 Milestones and/or mileposts that have to be removed during construction will be, wherever it is reasonably practicable to do so, returned to their original location before operation commences.

Summary of likely residual significant effects

- 5.4.39 The amendment will give rise to a new likely residual significant permanent major adverse effect on a Grade II listed Milepost (WHM108) by removing the milepost during modifications to the A51 Stone Road/Nantwich Road/A53 Newcastle Road junction.

Cumulative effects

- 5.4.40 There are no new or different likely significant cumulative effects for cultural heritage as a result of the amendment acting in combination with any other AP2 amendments.

Ecology and biodiversity

Scope, assumptions and limitations

- 5.4.41 The assessment scope, key assumptions and limitations for ecology and biodiversity are as set out in Volume 1, the SMR and SMR Addendum of the main ES and SMR Addendum 2 (see SES2 and AP2 ES Volume 5: Appendix CT-001-000).
- 5.4.42 This amendment has the potential to result in new or different significant construction effects only. Therefore, there is no operational assessment for ecology and biodiversity.
- 5.4.43 Where data are limited, a precautionary baseline has been built up according to the guidance provided in the SMR and SMR Addendum. This constitutes a 'reasonable worst case' basis for the subsequent assessment.
- 5.4.44 The precautionary approach to the assessment that has been adopted identifies the likely significant environmental effects of the amendment.

Existing environmental baseline

- 5.4.45 The ecological baseline of the area subject to the amendment has been based on aerial photography and relevant information from regional and local sources.
- 5.4.46 A summary of the baseline information relevant to the assessment of the amendment is provided below. Further detail on the relevant new or updated baseline information

is provided in Background Information and Data (BID) document BID-EC-019-000, including Map Series EC-02 which accompanies the SES2 and AP2 ES; and SES2, and AP2 ES Volume 5: Appendix EC-001-000, including Map Series EC-01.

- 5.4.47 For those receptors described in the main ES, further details are provided in Volume 2, CA4, Section 8, and Volume 5: Appendix EC-001-000, including Map Series EC-01. Baseline ecology reports that accompanied the main ES are provided in BID-EC-002-000 to BID-EC-014-000, including Map Series EC-02 to EC-12³⁹.
- 5.4.48 For those receptors described in SES1, further details are provided in Volume 2, CA4, Section 3. The baseline ecology report that accompanied SES1 is provided in BID EC-004-000, including Map Series EC-02, EC-04, EC-05, EC-10, EC-11 and EC-12⁴⁰.

Designated sites

- 5.4.49 The area subject to the amendment is located within the Natural England Impact Risk Zone⁴¹ for Maer Pool Site of Special Scientific Interest (SSSI), which is of national value. Maer Pool SSSI, covering an area of approximately 8.5ha, comprises of a natural eutrophic water body with marginal fen and well-developed reed swamp and is of special interest for freshwater invertebrates. Maer Pool SSSI was not reported in the main ES as it was not relevant to the assessment of the original scheme. Maer Pool SSSI is located approximately 900m from the area subject to the amendment.
- 5.4.50 There is one LWS of relevance to the assessment, which is of county value. The Bogs LWS, covering an area 19.9ha, comprises three woodlands including one which is wet woodland, and two grazed fields, one of which supports semi-improved acidic grassland. The Bogs LWS was not reported in the main ES as it was not relevant to the assessment of the original scheme. The Bogs LWS is located partially within the area subject to the amendment.
- 5.4.51 There is one Biodiversity Alert Site (BAS) of relevance to the assessment, which is of district value. The Maer Hills BAS, covering an area of 230ha, comprises a predominately coniferous plantation over dry heath and acidic ground flora. The Maer Hills BAS was not reported in the main ES as it was not relevant to the assessment of the original scheme. The Maer Hills BAS is located approximately 20m to the north-west of the area subject to the amendment.

Habitats

- 5.4.52 Habitats within the land required for the amendment include woodland, hedgerows, scattered trees and arable land. The habitats of relevance to the assessment of the amendment are described in further detail below.

³⁹ HS2 Ltd (2017). *High Speed Two (HS2) Phase 2a (West Midlands - Crewe), Background Information and Data*. Available online at: <https://www.gov.uk/government/publications/hs2-phase-2a-background-information-and-data-ecology-and-biodiversity>

⁴⁰ HS2 Ltd (2018). *High Speed Two (HS2) Phase 2a (West Midlands - Crewe), Supplementary ecological baseline data (BID EC-004-000)*. Available online at:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/692664/G33_Ecological_baseline_BID-EC-004-000_WEB.pdf

⁴¹ The Impact Risk Zones is a GIS tool developed by Natural England to make a rapid initial assessment of the potential risks to SSSI is posted by development proposal and indicate the types of development proposals which could potentially have adverse impacts. In this case the impact risk zone for infrastructure has been considered in this SSSI.

- 5.4.53 Broadleaved and wet woodland is present at The Bogs LWS to the south of the A51 Stone Road. This woodland is likely to qualify as lowland mixed deciduous woodland and wet woodland, which are habitats of principal importance in Section 41 of the Natural Environment and Rural Communities (NERC) Act (2006)⁴², and a conservation priority of the Staffordshire Biodiversity Action Plan⁴³ (BAP). The woodland is located partially within the area subject to the amendment. The woodland is of up to county value.
- 5.4.54 Hedgerows within the area subject to the amendment are predominately species-rich. Hedgerow with at least 80% cover of native woody species is a habitat of principal importance and a conservation priority of the Staffordshire BAP. These contribute towards a wider hedgerow network within the Whitmore Heath to Madeley area that is of district/borough value.

Species

- 5.4.55 Protected and/or notable species that are assumed to occur within the area subject to the amendment include bats, badger, polecat, harvest mouse, European hedgehog and brown hare.
- 5.4.56 The large areas of woodland at The Bogs LWS and Maer Hill BAS within and adjacent to the area subject to the amendment offers suitable habitats for bats, but do not form part of an existing bat assemblage reported within the main ES, as amended by SES1. These habitats have not been subject to survey and therefore, on a precautionary basis, are assumed to provide roosting, foraging and commuting opportunities for an assemblage of bats. The assumed bat assemblage associated with the woodland habitats at The Bogs LWS and Maer Hill BAS is of up to regional value.
- 5.4.57 The main ES, as amended by SES1, reported at least 11 social groups of badgers, identified through field surveys, throughout the Whitmore Heath to Madeley area. The area subject to the amendment includes suitable sett building and foraging habitats for badgers. The badger population throughout the Whitmore Heath to Madeley area are of local/parish value.
- 5.4.58 The main ES reported populations of other mammals including polecat, harvest mouse, European hedgehog and brown hare, identified through desk study records, as being potentially present throughout the Whitmore Heath to Madeley area. The area subject to the amendment includes suitable habitats for these species. If present, these populations are of local/parish value.

Future environmental baseline

Construction (2020)

- 5.4.59 The future baseline for construction in 2020 remains unchanged from that reported in the main ES Volume 5: Appendix CT-004-000.

⁴² Natural Environment and Rural Communities Act 2006 (2006 CHAPTER 16). Her Majesty's Stationery Office, London.

⁴³ Staffordshire Biodiversity Partnership. Staffordshire Biodiversity Action Plan [online]. Available online at: <http://www.sbap.org.uk/>

Effects arising during construction

Avoidance and mitigation measures

- 5.4.60 The assessment assumes implementation of the measures set out within the draft CoCP.
- 5.4.61 No avoidance or mitigation measures, additional to those reported in the main ES and draft CoCP, are required.

Assessment of impacts and effects

- 5.4.62 All of the effects within this section are reported in the absence of other mitigation.

Designated sites

- 5.4.63 Maer Pool SSSI will not be directly impacted by construction of the amendment. The closest point of construction of the amendment will be approximately 900m south-east of the SSSI. The SSSI forms part of the meres and mosses of the north-west Midlands and is designated for its open water and peatland sites and is a site of special interest for its freshwater invertebrates. The amendment will not give rise to new or different significant effects on the designated features of this SSSI.
- 5.4.64 The amendment will result in the permanent loss of approximately 610m² (0.3%) of woodland from The Bogs LWS. The loss of this habitat will give rise to a new permanent adverse effect on the structure and function of The Bogs LWS that is significant at up to the county level.
- 5.4.65 The amendment will not give rise to new or different significant effects on any other designated sites due to the scale of the works and their distance from the works. It will not change the level of significance of the effects reported in the main ES.

Habitats

- 5.4.66 Lowland mixed deciduous and wet woodland present at The Bogs LWS, to the south of the A51 Stone Road, was not reported in the main ES. The amendment will result in the additional loss of approximately 610m² of this woodland. The amendment will give rise to a new permanent adverse effect on woodland habitat that is significant at up to the county level.
- 5.4.67 On a precautionary basis, the main ES reported the permanent loss of 22.7km of existing hedgerow within the Whitmore Heath to Madeley area, which would result in a permanent adverse effect that is significant at the district/borough level. The amendment will result in the additional loss of approximately 1km of assumed species-rich hedgerow along the A51 Stone Road and A53 Newcastle Road. In the context of the hedgerow network within the Whitmore to Madeley area, this additional loss represents a different significant effect on the existing hedgerow network. However, this will not change the level of significance of the effect as reported in the main ES.
- 5.4.68 It is not likely that any other effects on habitats of relevance at more than the local/parish level will occur as a result of the amendment. Additional local/parish level effects arising from the AP2 revised scheme are listed in SES2 and AP2 ES Volume 5: Appendix EC-016-000.

Species

- 5.4.69 The amendment will result in the loss of mature trees within hedgerows and woodland, which on a precautionary basis are assumed to support bat roosts. The loss of assumed bat roosts will give rise to a new permanent adverse effect on the bat assemblage associated with the woodland habitats at The Bogs LWS and Maer Hill BAS that is significant at up to the regional level.
- 5.4.70 It is not likely that any other effects on species of relevance at more than the local/parish level will occur as a result of the amendment. Additional local/parish level effects arising from the AP2 revised scheme are listed in SES2 and AP2 ES Volume 5: Appendix EC-016-000.

Mitigation and residual effects

Other mitigation measures

- 5.4.71 The amendment includes the provision of approximately 0.1ha of woodland habitat creation within and adjacent to the existing boundary of The Bogs LWS. This habitat creation will occur within the land required for construction of the amendment only, to compensate for the loss of approximately 610m² of woodland habitat within the LWS. The target habitat type for woodland planting is lowland mixed deciduous woodland habitat of principal importance. A temporary adverse effect upon the woodland habitat at The Bogs LWS will occur until the woodland habitat creation has become established, after which this measure will reduce the effect to a level that is not significant.
- 5.4.72 The main ES reported the provision of artificial roosts where roosts would be lost to construction. Artificial roosting provision will be provided within and adjacent to woodland and hedgerow habitat creation areas to replace bat roosts lost during construction, in accordance with the Ecological Principles of Mitigation within the SMR Addendum. These measures will reduce the new adverse effect resulting from this amendment on the bat assemblage associated with the woodland habitats at The Bogs LWS and Maer Hill BAS to a level that is not significant.
- 5.4.73 Approximately 410m of new hedgerow will be planted as replacement for the loss of hedgerow along the A51 Stone Road and A53 Newcastle Road. However, as the amendment will result in the loss of approximately 1km of hedgerow, there will be a net reduction of approximately 590m in length of hedgerow as a result of the amendment after implementation of mitigation. In the context of the hedgerow network within the Whitmore Heath to Madeley area, the net reduction in hedgerow represents a different residual adverse effect upon the hedgerow network. However, this will not change the level of significance of the effect as reported in the main ES.

Summary of likely residual significant effects

- 5.4.74 The amendment will result in a different significant adverse residual effect upon the hedgerow network in the Whitmore Heath to Madeley area in comparison to that reported in the main ES, as amended by SES1. This is the result of the reduction of hedgerow after mitigation of approximately 590m within the area subject to the amendment, in comparison to the original scheme. A permanent adverse residual effect upon the hedgerow network in the Whitmore Heath to Madeley area will still

occur, which remains significant at district/borough level. As reported in the main ES, the reinstatement of existing hedgerow within land required only for construction provides an opportunity to reduce this residual effect to a level that is not significant.

Cumulative effects

- 5.4.75 There are no new or different likely significant cumulative effects for ecology and biodiversity as a result of the amendment acting in combination with any other AP2 amendments. The combined effect on hedgerows as a result of the AP2 revised scheme is reported at a route-wide level in SES2 and AP2 ES, Volume 3, Route-wide effects.

Landscape and visual

Scope, assumptions and limitations

- 5.4.76 The assessment scope, key assumptions and limitations for landscape and visual are as set out in Volume 1, the SMR and SMR Addendum of the main ES.
- 5.4.77 The amendment has the potential to result in new or different significant construction and operational visual effects only. Therefore, both construction and operational phases are considered in this visual assessment. There is no construction and operation assessment for landscape.

Existing environmental baseline

- 5.4.78 The amendment to modify the A51 Stone Road/Nantwich Road/A53 Newcastle Road junction is located outside of the study area for the original scheme, therefore the following new viewpoint has been identified to represent the view from residential properties along the A51 Nantwich Road.

View south-west of A51 Nantwich Road (viewpoint 021.02.014)

- 5.4.79 Residents of properties along the A51 Nantwich Road have slightly elevated close distance views across the road towards the car park of a public house and an open arable field bounded by low hedgerows. Woodland within The Bogs LWS is visible in the middle distance and this woodland screens many longer views. To the west of the woodland, there are distant views of higher land beyond the A53 Newcastle Road.

Future environmental baseline

Construction (2020) and operation (2027)

- 5.4.80 The future baseline for construction in 2020 and operation in 2027 remains unchanged from that reported in the main ES Volume 5: Appendix CT-004-000.

Temporary effects arising during construction

Avoidance and mitigation measures

- 5.4.81 No avoidance or mitigation measures additional to those reported in the main ES and draft CoCP are required.

Assessment of impacts and effects

View south-west of A51 Nantwich Road (viewpoint 021.02.014)

- 5.4.82 The construction works associated with the amendment will be prominent in close and middle distance views from viewpoint 021.02.014 which is located on the A51 Nantwich Road and represents the view from nearby properties.
- 5.4.83 The amendment to modify the A51 Stone Road/Nantwich Road/A53 Newcastle Road junction will introduce new construction activity associated with the road diversion works, closure of the existing junction and movement of construction vehicles. Removal of roadside vegetation and mature trees within The Bogs LWS will be noticeable in the middle distance as will the presence of the A51/A53 Junction Modifications satellite compound. This construction activity will alter the current rural outlook across a hedged field towards woodland within The Bogs LWS. Construction of the amendment will therefore result in a medium magnitude of change and will give rise to a new moderate adverse effect, which is significant.
- 5.4.84 For further information see SES2 and AP2 ES Volume 5: Appendix LV-001-004 and SES2 and AP2 ES Volume 5: Landscape and visual Map Book.

Mitigation and residual effects

Other mitigation measures

- 5.4.85 No mitigation measures additional to those identified in the main ES and draft CoCP are identified.

Summary of likely residual significant effects

- 5.4.86 The temporary residual significant effect during construction will remain as described above. This effect will be temporary and reversible in nature lasting only for the duration of the construction works. This residual effect will generally arise from the widespread presence of construction activity and construction plant within the landscape and viewed by surrounding residents, and users of public rights of way (PRoW) and main roads within the study area.
- 5.4.87 After implementation of construction phase mitigation, the amendment to modify the A51 Stone Road/Nantwich Road/A53 Newcastle Road junction will give rise to a new likely residual significant moderate adverse construction effect at residential properties associated with the view south-west of A51 Nantwich Road (viewpoint 021.02.014).

Cumulative effects

- 5.4.88 There are no new or different likely significant cumulative effects for landscape and visual as a result of the amendment acting in combination with any other AP2 amendments.

Permanent effects arising during operation

Avoidance and mitigation measures

- 5.4.89 No avoidance or mitigation measures additional to those reported in the main ES are required.

Assessment of impacts and effects

View south-west of A51 Nantwich Road (viewpoint 021.02.014)

- 5.4.90 The amendment to modify the A51 Stone Road/Nantwich Road/A53 Newcastle Road junction will be visible in close and middle distance views from viewpoint 021.02.014, which is located on the northern side of the A51 Nantwich Road and represents the view experienced by residents of nearby properties.
- 5.4.91 The amendment provides a permanent diversion of a section of the A53 Newcastle Road such that it will connect to the A51 Nantwich Road, approximately 80m east of its present location. This will require the loss of mature trees along the edge of The Bogs LWS close to the River Tern, which will be noticeable from the viewpoint.
- 5.4.92 At year 1, residents of nearby properties will have slightly elevated views along the new section of road, which will alter the current rural outlook across a hedged field towards woodland within The Bogs LWS. Roadside hedgerow habitat creation will be immature and provide little screening at this stage. Summer views will remain largely unchanged from the winter situation due to the lack of vegetation to provide additional summer screening. The amendment will therefore give rise to a medium magnitude of change and a new moderate adverse significant effect at year 1, not reported in the main ES.
- 5.4.93 At year 15 and year 60, the maturing mitigation planting will achieve some screening and integration of the road corridor into the surrounding landscape. The amendment will therefore give rise to a low magnitude of change and a new minor adverse effect at year 15 and year 60, which is not significant.
- 5.4.94 For further information see SES2 and AP2 ES Volume 5: Appendix LV-001-004 and SES2 and AP2 ES Volume 5: Landscape and visual Map Book.

Cumulative effects

- 5.4.95 There are no new or different likely significant cumulative effects for landscape and visual as a result of the amendment acting in combination with any other AP2 amendments.

Monitoring

- 5.4.96 Volume 1 of the main ES sets out the general approach to environmental monitoring during operation of the original scheme.

Traffic and transport

Scope, assumptions and limitations

- 5.4.97 The assessment scope, key assumptions and limitations for traffic and transport are as set out in Volume 1, the SMR and SMR Addendum of the main ES.

- 5.4.98 This amendment has the potential to result in new or different significant construction and operational effects for traffic and transport. Therefore, both construction and operational phases are considered in the assessment.
- 5.4.99 The assessment of the changes to construction traffic flows as a result of this amendment in combination with all SES2 changes and AP2 amendments is reported in Section 7.

Existing environmental baseline

- 5.4.100 The baseline traffic and transport information for the Whitmore Heath to Madeley area is as described in Volume 2, CA4, Section 14 of the main ES.
- 5.4.101 The A51 London Road, which traverses the western boundary of the area, and the A53 Newcastle Road/Whitmore Road, which passes through Baldwin's Gate and Whitmore, are primary 'A' roads in the Whitmore Heath to Madeley area. The A51 Nantwich Road/A53 Newcastle Road junction is a priority (give way) staggered crossroads junction. The primary road network can get busy at peak times and delays can be experienced, including at the A51 Nantwich Road/A53 Newcastle Road junction.

Future environmental baseline

Construction (2023) and operation (2027 and 2041)

- 5.4.102 The future baseline for construction in 2023 and operation in 2027 and 2041 remains unchanged from that reported in the main ES Volume 5: Appendix CT-004-000.

Effects arising during construction

Avoidance and mitigation measures

- 5.4.103 No avoidance or mitigation measures additional to those reported in the main ES and draft CoCP are required.

Assessment of impacts and effects

- 5.4.104 The main ES reported that construction of the original scheme would result in queues and delays for vehicle occupants at the A51 Nantwich Road/A53 Newcastle Road junction, which would give rise to a major adverse significant traffic congestion and delay effect.
- 5.4.105 Although the amendment will reduce the impacts of construction traffic at the junction (considered in combination with all SES2 changes and AP2 amendments in Section 7), the temporary construction works for the junction modifications and associated traffic management measures will be likely to result in a temporary reduction in capacity and some delays at the junction during its construction. Construction of the junction modifications is expected to take six months to complete. Although once completed the changes will reduce congestion and delays, this amendment will give rise to a new temporary moderate adverse effect on traffic flows and delays for road users during its construction, which is significant.
- 5.4.106 For further information see SES2 and AP2 ES Volume 5: Appendix TR-001-000; and the SES2 and AP2 ES Volume 5 Traffic and transport Map Book.

Mitigation and residual effects

Other mitigation measures

- 5.4.107 No mitigation measures additional to those reported in the main ES and draft CoCP are required.

Summary of likely residual significant effects

- 5.4.108 During the works, the amendment will give rise to a new likely residual significant temporary moderate adverse effect on traffic flows and delays for road users at the junction of the A51 Nantwich Road/A53 Newcastle Road.

Cumulative effects

- 5.4.109 There are no new or different likely significant cumulative effects for traffic and transport as a result of the amendment acting in combination with any other AP2 amendments.
- 5.4.110 The assessment of the changes to construction traffic flows as a result of this amendment in combination with all SES2 changes and AP2 amendments, are reported in Section 7.

Effects arising from operation

Avoidance and mitigation measures

- 5.4.111 No avoidance or mitigation measures additional to those reported in the main ES are required.

Assessment of impacts and effects

- 5.4.112 Whilst the amendment is not required to support the AP2 revised scheme in the operational phase, as the scheme does not add any substantial permanent traffic to the area, the junction will be retained following construction.
- 5.4.113 The main ES reported that the existing staggered junction of the A51 Nantwich Road/A53 Newcastle Road presently operates over-capacity with queues and delays at the junction. In the absence of any changes to the junction, there would be a substantial worsening of queues and delays at the junction from growth in existing traffic patterns in the future assessment years of 2027 and 2041. For further information see SES2 and AP2 ES Volume 5: Appendix TR-001-000.
- 5.4.114 The amendment will substantially reduce the queues and delays to the junction in the 2027 and 2041 future assessment years. The amendment will also improve the safety of turning manoeuvres by managing the turning movements under signal control. The amendment will give rise to a major permanent beneficial congestion and delay effect for vehicle occupants in 2027 and 2041, which is significant.
- 5.4.115 For further information see SES2 and AP2 ES Volume 5: Appendix TR-001-000; and the SES2 and AP2 ES Volume 5: Traffic and transport Map Book.

Mitigation and residual effects

Other mitigation measures

- 5.4.116 No mitigation measures additional to those reported in the main ES are required.

Summary of likely residual significant effects

- 5.4.117 The amendment will give rise to a new likely residual significant permanent major beneficial effect for road users at the staggered junction of the A51 Nantwich Road/A53 Newcastle Road in the future assessment years of 2027 and 2041.

Cumulative effects

- 5.4.118 There are no new or different likely significant cumulative effects for traffic and transport as a result of the amendment acting in combination with any other AP2 amendments or any relevant committed development.

Monitoring

- 5.4.119 Volume 1 of the main ES sets out the general approach to environmental monitoring during operation of the original scheme.
- 5.4.120 There are no changes to the monitoring requirements identified in the main ES for traffic and transport as a result of this amendment.

Water resources and flood risk

Scope, assumptions and limitations

- 5.4.121 The assessment scope, key assumptions and limitations for water resources and flood risk are as set out in Volume 1, the SMR and SMR Addendum of the main ES and SMR Addendum 2 (see SES2 and AP2 ES Volume 5: Appendix CT-001-000).
- 5.4.122 This amendment has the potential to result in new or different significant construction effects only. Therefore, there is no operational assessment for water resources and flood risk.

Existing environmental baseline

- 5.4.123 The baseline water resources information for the Whitmore Heath to Madeley area is as described in Volume 2, CA4, Section 15 of the main ES. Further details relating to water resources and flood risk for this area are provided in Volume 5: Appendix WR-002-004 and Appendix WR-003-004 and the main ES Volume 5: Water resources and flood risk Map Book.
- 5.4.124 This amendment is located within the vicinity of the River Tern, a tributary of the River Severn, and close to the source protection zones associated with a groundwater abstraction at the Wellings, which is used for public water supply. It will involve construction activities of a nature and scale that have potential water quality implications.

Future environmental baseline

Construction (2020)

- 5.4.125 The future baseline for construction in 2020 remains unchanged from that reported in the main ES Volume 5: Appendix CT-004-000.

Effects arising during construction

- 5.4.126 The main ES reported no significant effects on surface water quality due to site runoff and increased pollution risk in the vicinity of this amendment. The amendment has the potential to give rise to temporary adverse impacts on surface water quality which could affect abstractions and the water environment. However, the amendment will be constructed in accordance with the measures specifically designed to safeguard water resources outlined in the draft CoCP.
- 5.4.127 Therefore, the amendment will not give rise to a new or different significant effect and will not change the level of significance of the effects reported in the main ES.

Cumulative effects

- 5.4.128 There are no new or different likely significant cumulative effects for water resources and flood risk as a result of the amendment acting in combination with any other AP2 amendments.

Summary of new or different likely residual significant effects as a result of the amendment

- 5.4.129 The amendment will give rise to a new likely residual significant permanent major adverse effect on a Grade II listed Milepost (WHM108) which will be removed during modifications to the A51 Stone Road/Nantwich Road/A53 Newcastle Road.
- 5.4.130 In the area subject to the amendment there will be a reduction in hedgerow habitat creation to be provided which will give rise to a different significant effect upon the hedgerow network. However, this will not change the level of significance reported in the main ES, as amended by SES1.
- 5.4.131 The amendment will give rise to a new likely residual significant construction effect at viewpoint 021.02.014, view south-west of A51 Nantwich Road.
- 5.4.132 During the works, the amendment will give rise to a new likely residual significant effect on traffic flows and delays for road users as a result of reduced capacity of the A51 Nantwich Road/A53 Newcastle Road junction during construction. The permanent provision of a junction at the A51 Nantwich/A53 Newcastle Road will reduce queues and delays at the junction and will give rise to a new likely residual significant permanent major beneficial effect for road users in the future assessment years of 2027 and 2041.

5.5 Additional land required and a change to Bill powers for provision of a public right of way over Whitmore Heath tunnel north porous portal (AP2-004-004)

- 5.5.1 The Bill provides for a 150m section of Snape Hall Road to be stopped up where it crosses the HS2 route at the Whitmore Heath tunnel north porous portal. Two turning heads would be provided for vehicle access on the retained sections of Snape Hall Road, one to the south of the HS2 route and one to the north. See Map CT-06-230, D6 to C4, in the main ES Volume 2, CA4 Map Book. A porous portal, 150m in length, would be provided at the northern end of Whitmore Heath tunnel, with a headwall 94m in length and up to 15m in height at the end of the porous portal. An area of landscape mitigation planting and woodland habitat creation would be provided to the south and west of the porous portal. See Map CT-06-230, C6, in the main ES Volume 2, CA4 Map Book.
- 5.5.2 Since submission of the Bill, a requirement has been identified to maintain access across the HS2 route at Snape Hall Road. A new public right of way (PRoW), Whitmore New Footpath, will be provided to cross the HS2 route, approximately 125m south of the existing Snape Hall Road. Whitmore New Footpath will extend from the turning head to the south of the HS2 route, via a set of steps that are 100m in length, to cross over the HS2 route. Whitmore New Footpath will then follow the earthworks footprint of Whitmore Heath tunnel north porous portal, before descending towards the north to re-join the existing Snape Hall Road, via a second set of steps that are 75m in length. The turning head to the north of the HS2 route, included in the original scheme, will be removed, and the existing Snape Hall Road on the northern side of the HS2 route will be stopped up to public vehicles at the junction with Dab Green Lane, but retained as a private accommodation access with public access for pedestrians only. Whitmore New Footpath will continue north-east along the existing Snape Hall Road to the junction with Dab Green Lane. See Map CT-06-230, C6 to D3, in the SES2 and AP2 ES Volume 2, CA4 Map Book.
- 5.5.3 The journey length for pedestrians will be reduced from up to 950m, as reported in the main ES, to up to 190m.
- 5.5.4 To accommodate the new steps at the southern turning head, an area of woodland habitat creation provided for in the original scheme will be reduced by 0.1ha and an area of landscape mitigation planting will be increased by 120m². See Map CT-06-230, D5 to D6, in the SES2 and AP2 ES Volume 2, CA4 Map Book.
- 5.5.5 This amendment will be constructed over a period of three months, commencing in 2024. Works will be managed from Whitmore North cutting satellite compound. There will be no access for pedestrians during the construction period.
- 5.5.6 The provision of a new PRoW is outside the limits of the Bill. The amendment will require new permanent powers for provision of the access and will result in the requirement for an additional 0.1ha of land. See Map CT-06-230, D4 to D3, in the SES2 and AP2 ES Volume 2, CA4 Map Book.

Topics included in the AP2 assessment

- 5.5.7 This amendment is considered to require reassessment of the environmental effects and mitigation in the main ES, as amended by SES1 and SES2, for the following topics: ecology and biodiversity; and traffic and transport.

Ecology and biodiversity

Scope, assumptions and limitations

- 5.5.8 The assessment scope, key assumptions and limitations for ecology and biodiversity are as set out in Volume 1, the Scope and Methodology Report⁴⁴ (SMR) and SMR Addendum⁴⁵ of the main ES and SMR Addendum 2 (see SES2 and AP2 ES Volume 5: Appendix CT-001-000).
- 5.5.9 This amendment has the potential to result in new or different significant construction effects only. Therefore, there is no operational assessment for ecology and biodiversity.
- 5.5.10 Where data are limited, a precautionary baseline has been built up according to the guidance provided in the SMR and SMR Addendum. This constitutes a 'reasonable worst case' basis for the subsequent assessment.
- 5.5.11 The precautionary approach to the assessment that has been adopted identifies the likely significant environmental effects of the amendment.

Existing environmental baseline

- 5.5.12 The ecological baseline of the of the area subject to the amendment has been based on field data collated for the main ES and SES1, aerial photography, and relevant information from regional and local sources. In addition, the baseline has been informed by additional Phase 1 habitat survey.
- 5.5.13 A summary of the baseline information relevant to the assessment of the amendment is provided below. Further detail on the relevant new or updated baseline information is provided in Background Information and Data (BID) document BID-EC-019-000, including Map Series EC-02 which accompanies the SES2.
- 5.5.14 For those receptors described in the main ES, further details are provided in Volume 2, CA4, Section 8, and Volume 5: Appendix EC-001-000, including Map Series EC-01. Baseline ecology reports that accompanied the main ES are provided in BID-EC-002-000 to BID-EC-014-000, including Map Series EC-02 to EC-12⁴⁶.

⁴⁴ HS2 Ltd (2017). *High Speed Rail (West Midlands - Crewe) Environmental Statement*, Volume 5: Technical appendices, Environmental Impact Assessment Scope and Methodology Report (Appendix CT-001-001). Available online at: <https://www.gov.uk/government/publications/scope-and-methodology-report-for-hs2-phase-2a>

⁴⁵ HS2 Ltd (2017). *High Speed Rail (West Midlands - Crewe) Environmental Statement*, Volume 5: Technical appendices, Environmental Impact Assessment Scope and Methodology Report Addendum (Appendix CT-001-002). Available online at: <https://www.gov.uk/government/publications/scope-and-methodology-report-for-hs2-phase-2a>

⁴⁶ HS2 Ltd (2017). *High Speed Two (HS2) Phase 2a (West Midlands - Crewe), Background Information and Data*. Available online at: www.gov.uk/hs2

- 5.5.15 For those receptors described in SES₁, further details are provided in Volume 2, CA₄, Section 3. The baseline ecology report that accompanied SES₁ is provided in BID EC-004-000, including Map Series EC-02, EC-04, EC-05, EC-10, EC-11 and EC-12⁴⁷.

Designated sites

- 5.5.16 There are no designated sites of relevance to the assessment of the amendment.

Habitats

- 5.5.17 Habitats within the area subject to the amendment include broadleaved woodland, plantation woodland, species-rich semi-improved grassland, species-poor semi-improved grassland, amenity grassland and hedgerows. The habitats of relevance to the assessment of the amendment are described in further detail below.
- 5.5.18 Small areas of semi-natural broadleaved woodland are present at Whitmore Heath. This woodland comprises lowland mixed deciduous woodland, a habitat of principal importance listed under the provisions of Section 41 of the Natural Environment and Rural Communities (NERC) Act (2006)⁴⁸ and a conservation priority of the Staffordshire Biodiversity Action Plan⁴⁹ (BAP). The woodland is located partially within the area subject to the amendment. The woodland is of district/borough value.
- 5.5.19 Broadleaved plantation woodland is present at Whitmore Heath. The woodland is located partially within the area subject to the amendment. The woodland is of local/parish value.
- 5.5.20 Species rich semi-improved grassland is present to the west of Limepits. The grassland is likely to qualify as lowland meadow, a habitat of principal importance and a conservation priority of the Staffordshire BAP. These areas of grassland are located partially within the area subject to the amendment. The grassland is of up to county value.
- 5.5.21 Species poor semi-improved grassland is present to the north of Whitmore Heath. This area of grassland is located partially within the area subject to the amendment. The grassland is of local/parish value.
- 5.5.22 Hedgerows within the area subject to the amendment are predominately species-rich. Hedgerow with at least 80% cover of native woody species is a habitat of principal importance and a conservation priority of the Staffordshire BAP. These contribute towards a wider hedgerow network within the Whitmore Heath to Madeley area that is of district/borough value.

Species

- 5.5.23 Protected and/or notable species that are known or assumed to occur within the land required for the amendment include bats, barn owl, badger, fallow deer, polecat, harvest mouse, European hedgehog, brown hare and common reptile species.

⁴⁷ HS2 Ltd (2018). *High Speed Two (HS2) Phase 2a (West Midlands - Crewe), Supplementary ecological baseline data (BID EC-004-000)*. Available online at:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/692664/G33_Ecological_baseline_BID-EC-004-000_WEB.pdf

⁴⁸ Natural Environment and Rural Communities Act 2006 (2006 CHAPTER 16). Her Majesty's Stationery Office, London.

⁴⁹ Staffordshire Biodiversity Partnership. Staffordshire Biodiversity Action Plan [online]. Available online at: <http://www.sbap.org.uk/>

- 5.5.24 The main ES, as amended by SES1, reported a bat assemblage associated with habitats in the Whitmore area. Field surveys in this area recorded roosts of brown long-eared bat, including a maternity roost, a Myotis species bat and soprano pipistrelle and foraging and commuting activity by common pipistrelle, a Myotis species bat, serotine and a Nyctalus species bat. The area subject to the amendment contains potential bat roosting, foraging and commuting habitat that are likely to be used by this bat assemblage. The bat assemblage associated with habitats in the Whitmore area is of up to county value.
- 5.5.25 The main ES reported a population of barn owl at Whitmore, identified through desk study records. The area subject to the amendment includes grassland habitats that are likely to be used by foraging barn owls, and nearby farm buildings which may be used by nesting barn owls. Barn owl are a conservation priority of the Staffordshire BAP. The barn owl populations at Whitmore are of up to county value.
- 5.5.26 The main ES, as amended by SES1, reported at least 11 social groups of badgers, identified through field surveys, throughout the Whitmore Heath to Madeley area. The area subject to the amendment includes suitable sett building and foraging habitats for badgers. The badger populations throughout the Whitmore Heath to Madeley area are of local/parish value.
- 5.5.27 The main ES reported populations of other mammals including fallow deer, polecat, harvest mouse, European hedgehog and brown hare, identified through desk study records, as being potentially present throughout the Whitmore Heath to Madeley area. The area subject to the amendment includes suitable habitats for these species. If present, these populations are of local/parish value.
- 5.5.28 The main ES reported populations of common reptile species such as grass snake and slow-worm, identified through desk study records, as being potentially present at low numbers throughout the Whitmore Heath to Madeley area. The area subject to the amendment includes suitable habitats for these species. If present, these populations are of local/parish value.

Future environmental baseline

Construction (2020)

- 5.5.29 The future baseline for construction in 2020 remains unchanged from that reported in the main ES Volume 5: Appendix CT-004-000.

Effects arising during construction

Avoidance and mitigation measures

- 5.5.30 No avoidance or mitigation measures additional to those reported in the main ES and draft Code of Construction Practice (CoCP)⁵⁰ are required.

⁵⁰ HS2 Ltd (2017). *High Speed Rail (West Midlands - Crewe) Environmental Statement*, Volume 5: Technical appendices, draft Code of Construction Practice (CT-003-000). Available online at <https://www.gov.uk/government/publications/draft-code-of-construction-practice-for-hs2-phase-2a>

Assessment of impacts and effects

Habitats

- 5.5.31 On a precautionary basis, the main ES reported a loss of 22.7km of hedgerow within the Whitmore Heath to Madeley area, which would result in a permanent adverse effect that is significant at district/borough level. The amendment will not alter the extent of hedgerow loss. The amendment will not give rise to a new or different significant effect on the hedgerow network within the Whitmore Heath to Madeley area and will not change the level of significance of the effects reported in the main ES.
- 5.5.32 The main ES reported the loss of 1.2ha (32%) of species-rich semi-improved grassland to the west of Limepits, to the north-east of Whitmore Wood, which would result in a permanent adverse effect that is significant at the county level. The amendment will not alter the extent of loss of grassland to the west of Limepits. The amendment will not give rise to a new or different significant effect and will not change the level of significance of the effect reported in the main ES.

Species

- 5.5.33 The main ES, as amended by SES₁, reported a direct loss of bat roosts and loss and fragmentation of foraging and commuting habitat used by the assemblage of bats associated with habitats in the Whitmore area, which would result in a permanent adverse effect that is significant at up to county level. The amendment will not alter the extent of loss of roosting features or habitats used by this bat assemblage. The amendment will not give rise to a new or different significant effect on the assemblage of bats associated with habitats in the Whitmore area and will not change the level of significance of the effects reported in the main ES.
- 5.5.34 The main ES reported the loss of barn owl foraging habitat within the Whitmore to Madeley area, which would result in a permanent adverse effect that is significant at up to county level. The amendment will not alter the extent of loss of foraging features or habitats used by barn owls. The amendment will not give rise to a new or different significant effect on the barn owl population identified east of Whitmore and will not change the level of significance of the effects reported in the main ES.
- 5.5.35 It is not likely that any other effects on species of relevance at more than the local/parish level will occur as a result of the amendment. Additional local/parish level effects arising from the AP2 revised scheme are listed in SES₂ and AP₂ ES Volume 5: Appendix EC-016-000.

Mitigation and residual effects

Other mitigation measures

- 5.5.36 The main ES reported the creation of approximately 0.2ha of woodland habitat to the south of Whitmore Heath tunnel north portal to partly compensate for the loss of ancient woodland within the Whitmore Heath to Madeley area. The amendment will reduce this area of woodland habitat creation by approximately 0.1ha, to allow for the construction of the steps that form part of Whitmore New Footpath and associated landscape planting for visual screening. Ancient woodland is irreplaceable and all ancient woodland losses reported within the main ES are residual adverse significant

effects irrespective of the compensatory planting included within the original scheme. Therefore, whilst the amendment will result in a 0.1ha reduction in the ancient woodland compensation, it will not give rise to a different significant effect on ancient woodland in the Whitmore Heath to Madeley area.

Summary of likely residual significant effects

- 5.5.37 With the implementation of the mitigation proposed, the ecological effects arising from the amendment are reduced to a level that is not considered to be significant. The significant effects of the amendment in this area are therefore unchanged from those reported in the main ES.

Cumulative effects

- 5.5.38 There are no new or different likely significant cumulative effects for ecology and biodiversity as a result of the amendment acting in combination with any other AP2 amendments.

Traffic and transport

Scope, assumptions and limitations

- 5.5.39 The assessment scope, key assumptions and limitations for traffic and transport are as set out in Volume 1, the SMR and SMR Addendum of the main ES.
- 5.5.40 This amendment has the potential to result in new or different significant construction and operational effects for traffic and transport. Therefore, both construction and operational phases are considered in this assessment.

Existing environmental baseline

- 5.5.41 The HS2 route will cross the existing route of seven PRoW including three bridleways in the Whitmore Heath to Madeley area. The HS2 route will also cross a number of roads including Snape Hall Road. Snape Hall Road is an unclassified local road in the area which provides access around Whitmore Heath.
- 5.5.42 There are pedestrian footways adjacent to many of the roads in the built up areas of Baldwin's Gate, Madeley and Woore. Footways vary in width and condition within these areas. Where there is no formal footway provision adjacent to a road, non-motorised user numbers are generally low.

Future environmental baseline

Construction (2023) and operation (2027 and 2041)

- 5.5.43 The future baseline for construction in 2023 and operation in 2027 and 2041 remains unchanged from that reported in the main ES Volume 5: Appendix CT-004-000.

Effects arising during construction

Avoidance and mitigation measures

- 5.5.44 No avoidance or mitigation measures additional to those reported in the main ES and draft CoCP are required.

Assessment of impacts and effects

- 5.5.45 The main ES reported that a section of Snape Hall Road would be permanently stopped up on either side of the HS2 route. The main ES reported a permanent moderate adverse significant severance effect from an increase in distance of up to 950m for non-motorised users of Snape Hall Road via the existing network along Snape Hall Road and Heath Road. The main ES only reported permanent effects in the operation of the scheme, as the temporary impacts during construction and the permanent impacts during operation of the stopping up of Snape Hall Road on non-motorised users were the same.
- 5.5.46 During construction there will be no access across the HS2 route on Snape Hall Road. During this time non-motorised users will be required to divert via the existing network along Snape Hall Road and Heath Road with an increase in distance for non-motorised users of up to 950m. This will result in a new temporary moderate adverse severance effect on non-motorised users of Snape Hall Road, which is significant.
- 5.5.47 For further information see SES2 and AP2 ES Volume 5: Appendix TR-001-000; and the SES2 and AP2 ES Volume 5 Traffic and transport Map Book.

Mitigation and residual effects

Other mitigation measures

- 5.5.48 No mitigation measures additional to those reported in the main ES and draft CoCP are required.

Summary of likely residual significant effects

- 5.5.49 The amendment will give rise to a new likely residual significant temporary moderate adverse severance effect for non-motorised users of Snape Hall Road from an increase in distance of up to 950m.

Cumulative effects

- 5.5.50 There are no new or different likely significant cumulative effects for traffic and transport as a result of the amendment acting in combination with any other AP2 amendments or any relevant committed development.

Effects arising from operation

Avoidance and mitigation measures

- 5.5.51 No avoidance or mitigation measures additional to those reported in the main ES are required.

Assessment of impacts and effects

- 5.5.52 The main ES reported that a section of Snape Hall Road would be permanently stopped up between points on either side of the HS2 route. The main ES reported a permanent moderate adverse significant effect on non-motorised users as a result of severance from an increase in travel distance of up to 950m.
- 5.5.53 The amendment will give rise to a different significant effect, as it will maintain connectivity for non-motorised users across the HS2 route and reduce the diversion

distance for non-motorised users, from up to 950m to up to 190m, via a new footpath and steps. This will change the level of significance of the effect reported in the main ES, from a permanent moderate adverse significant severance effect to a permanent minor adverse severance effect, which is significant.

5.5.54 See SES2 and AP2 ES Volume 5: Appendix TR-001-000; and the SES2 and AP2 ES Volume 5 Traffic and transport Map Book.

5.5.55 The amendment will not change the use of Snape Hall Road by vehicle occupants compared to the main ES.

Mitigation and residual effects

Other mitigation measures

5.5.56 No mitigation measures additional to those reported in the main ES are required.

Summary of likely residual significant effects

5.5.57 The amendment will give rise to a different likely residual significant effect on non-motorised users of Snape Hall Road as a result of reducing the length of the diversion. The level of significance of the effect reported in the main ES, will change from a permanent moderate adverse significant severance effect to a permanent minor adverse significant severance effect.

Cumulative effects

5.5.58 There are no new or different likely significant cumulative effects for traffic and transport as a result of the amendment acting in combination with any other AP2 amendments or any relevant committed development.

Monitoring

5.5.59 Volume 1 of the main ES sets out the general approach to environmental monitoring during operation of the original scheme.

5.5.60 There are no changes to the monitoring requirements identified in the main ES for traffic and transport as a result of this amendment.

Summary of new or different likely residual effects as a result of the amendment

5.5.61 During construction, the amendment will give rise to a new likely residual significant temporary moderate adverse severance effect for non-motorised users of Snape Hall Road from an increase in distance of up to 950m. On completion of construction, the amendment will give rise to a different likely residual permanent severance effect on non-motorised users of Snape Hall Road as a result of reducing the length of the diversion. The level of significance of the effect reported in the main ES, will change from a permanent moderate adverse significant severance effect to a permanent minor adverse significant severance effect.

5.6 Additional land for new pipework from the borrow pit west of Netherset Hey Farm for groundwater recharge to River Lea (AP2-004-005)

- 5.6.1 The Bill provides for a borrow pit to the west of Netherset Hey Farm, for the extraction of sand and gravel for construction, along with mitigation measures to manage the recirculation of groundwater to the River Lea, as a result of the excavation and dewatering of the borrow pit. A minor tributary of the River Lea would be temporarily diverted. See Map CT-05-232, H5 to D1, and Map CT-05-232-R1, H10 to G1H, in the main ES Volume 2, CA4 Map Book.
- 5.6.2 Excavation and dewatering of the borrow pit could result in localised and controlled impacts on groundwater flows, which would be minimised through the implementation of the Code of Construction Practice (CoCP)⁵¹. However, potential would remain for base flows in nearby watercourses to be impacted while groundwater levels are lowered in the borrow pits during excavation.
- 5.6.3 The main ES assumed that mitigation for the management of groundwater base flows into the River Lea would be provided during excavation and dewatering of the borrow pits; including recirculation of treated water from the borrow pit back into the River Lea at an appropriate rate and location.
- 5.6.4 Since submission of the Bill, further design development and groundwater modelling has identified additional environmental mitigation to pump and pipe water from the borrow pit to a suitable discharge point at the River Lea for groundwater recharge, upstream of the borrow pit.
- 5.6.5 A temporary pipe route is proposed, 700m in length, extending from the borrow pit to the River Lea. See Map CT-05-232, H4 to H8, in the SES2 and AP2 ES Volume 2, CA4 Map Book. The pipe will run from north to south, crossing under the West Coast Main Line (WCML) and the Madeley Chord, and running parallel to the northern side of the River Lea, within a shallow trench at a depth of up to 1m. A temporary access track, approximately 3m in width will be provided alongside the length of the recharge pipework. The pipe and access track will be within a corridor, approximately 10m in width. Where the pipe joins the River Lea, a temporary outfall will be provided, along with measures to protect the bed and banks from scour.
- 5.6.6 The pipe will be provided early within the period required for extraction from the borrow pit west of Netherset Hey Farm, and will be removed once extraction ceases, and the pipe route will be reinstated to its current use. Works will be managed from the River Lea viaduct satellite compound.
- 5.6.7 The provision of new temporary pipework from the borrow pit west of Netherset Hey Farm for groundwater recharge to River Lea is outside the limits of the Bill and will result in the temporary requirement for an additional 0.8ha of land, some of which will be from Manor Farm (CA4/10). See Map CT-05-232, H7 to H8 in the SES and AP ES

⁵¹ HS2 Ltd (2017). *High Speed Rail (West Midlands - Crewe) Environmental Statement*, Volume 5: Technical appendices, draft Code of Construction Practice (CT-003-000). Available online at <https://www.gov.uk/government/publications/draft-code-of-construction-practice-for-hs2-phase-2a>

Volume 2, CA4 Map Book. It is assumed that all of the additional land will be returned to its existing use following construction.

Topics included in the AP2 assessment

- 5.6.8 This amendment is considered to require reassessment of the environmental effects and mitigation in the main ES, as amended by SES1 and SES2, for ecology and biodiversity.

Ecology and biodiversity

Scope, assumptions and limitations

- 5.6.9 The assessment scope, key assumptions and limitations for ecology and biodiversity are as set out in Volume 1, the Scope and Methodology Report (SMR)⁵² and the SMR Addendum⁵³ of the main ES and SMR Addendum 2 (see SES2 and AP2 ES Volume 5: Appendix CT-001-000).
- 5.6.10 This amendment has the potential to result in new or different significant construction effects only. Therefore, there is no operational assessment for ecology and biodiversity.
- 5.6.11 Where data are limited, a precautionary baseline has been built up according to the guidance provided in the SMR and SMR Addendum. This constitutes a 'reasonable worst case' basis for the subsequent assessment.
- 5.6.12 The precautionary approach to the assessment that has been adopted identifies the likely significant environmental effects of the amendment.

Existing environmental baseline

- 5.6.13 The ecological baseline of the of the area subject to the amendment has been based on field data collated for the main ES and SES1, aerial photography, and relevant information from regional and local sources.
- 5.6.14 A summary of the baseline information relevant to the assessment of the amendment is provided below. Further detail on the relevant new or updated baseline information is provided in Background Information and Data (BID) document EC-019-000, including Map Series EC-02 which accompanies the SES2 and AP2 ES.
- 5.6.15 For those receptors described in the main ES, further details are provided in Volume 2, CA4, Section 8, and Volume 5: Appendix EC-001-000, including Map Series EC-01. Baseline ecology reports that accompanied the main ES are provided in BID-EC-002-000 to BID-EC-014-000, including Map Series EC-02 to EC-12⁵⁴.

⁵² HS2 Ltd (2017). *High Speed Rail (West Midlands - Crewe) Environmental Statement*, Volume 5: Technical appendices, Environmental Impact Assessment Scope and Methodology Report (Appendix CT-001-001). Available online at: <https://www.gov.uk/government/publications/scope-and-methodology-report-for-hs2-phase-2a>

⁵³ HS2 Ltd (2017). *High Speed Rail (West Midlands - Crewe) Environmental Statement*, Volume 5: Technical appendices, Environmental Impact Assessment Scope and Methodology Report Addendum (Appendix CT-001-002). Available online at: <https://www.gov.uk/government/publications/scope-and-methodology-report-for-hs2-phase-2a>

⁵⁴ HS2 Ltd (2017). *High Speed Two (HS2) Phase 2a (West Midlands - Crewe), Background Information and Data*. Available online at: <https://www.gov.uk/government/publications/hs2-phase-2a-background-information-and-data-ecology-and-biodiversity>

- 5.6.16 For those receptors described in SES₁, further details are provided in Volume 2, CA₄, Section 3. The baseline ecology report that accompanied SES₁ is provided in BID EC-004-000, including Map Series EC-02, EC-04, EC-05, EC-10, EC-11 and EC-12⁵⁵.

Designated sites

- 5.6.17 There are no designated sites of relevance to the assessment of the amendment.

Habitats

- 5.6.18 Habitats within the area subject to the amendment include broadleaved woodland, species-rich semi-improved neutral grassland, species-poor semi-improved grassland, improved grassland, arable fields, hedgerows and sections of the River Lea. The habitats of relevance to the assessment of the amendment are described in further detail below.
- 5.6.19 An unnamed semi-natural broadleaved woodland is present bordering the Stoke to Market Drayton Railway. This woodland is likely to qualify as mixed deciduous woodland, a habitat of principal importance in Section 41 of the Natural Environment and Rural Communities (NERC) Act (2006)⁵⁶ and a conservation priority of the Staffordshire Biodiversity Action Plan⁵⁷ (BAP). The woodland is located partially within the area subject to the amendment. The woodland is of up to district/borough value.
- 5.6.20 An area of species-rich semi-improved neutral grassland is present alongside the WCML. This grassland is likely to qualify as lowland meadow, a habitat of principal importance and a conservation priority of the Staffordshire BAP. The grassland is partially within the area subject to the amendment. The grassland is of local/parish value.
- 5.6.21 Species-poor semi-improved grassland is present to the south of the River Lea. The grassland is partially within the area subject to the amendment. The grassland is of up to local/parish value.
- 5.6.22 Hedgerows within the area subject to the amendment are predominately species-rich. Hedgerow with at least 80% cover of native woody species is a habitat of principal importance and a conservation priority of the Staffordshire BAP. These contribute towards a wider hedgerow network within the Whitmore Heath to Madeley area that is of district/borough value.
- 5.6.23 The River Lea, which runs south of the WCML, provides an important habitat and wildlife corridor for wildlife dispersal. A section of the River Lea is partially within the area subject to the amendment. The River Lea is of county value.

⁵⁵ HS2 Ltd (2018). *High Speed Two (HS2) Phase 2a (West Midlands - Crewe), Supplementary ecological baseline data (BID EC-004-000)*. Available online at:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/692664/G33_Ecological_baseline_BID-EC-004-000_WEB.pdf

⁵⁶ Natural Environment and Rural Communities Act 2006 (2006 CHAPTER 16). Her Majesty's Stationery Office, London

⁵⁷ Staffordshire Biodiversity Partnership. Staffordshire Biodiversity Action Plan [online]. Available at: <http://www.sbap.org.uk/>

Species

- 5.6.24 Protected and/or notable species that are known or assumed to occur within the land required for the amendment include bats, otter, water vole, badger, polecat, harvest mouse, European hedgehog, brown hare and common reptile species.
- 5.6.25 The main ES, as amended by SES₁, reported a bat assemblage associated with habitats between Hey Sprink and Barhill Wood. Field surveys in this area recorded common and soprano pipistrelle roosts, a roost of *Myotis* species and an unidentified bat species. The area subject to the amendment contains potential bat roosting and foraging and commuting habitats that are likely to be used by this bat assemblage. The bat assemblage includes several species of principal importance and other species that are conservation priorities of the Staffordshire BAP. The bat assemblage associated with habitats between Hey Sprink and Barhill Wood is of up to county value.
- 5.6.26 The main ES, as amended by SES₁, reported a population of otter using the River Lea and associated tributaries. Otter is an Annex 2 species⁵⁸, and is also a species of principal importance and a conservation priority for the Staffordshire BAP. The section of the River Lea within the area subject to the amendment is likely to be used by otter. The otter population is of up to district/borough value.
- 5.6.27 The main ES reported a potential population of water vole using the River Lea and associated tributaries. Water vole is a species of principal importance and a conservation priority of the Staffordshire BAP. On a precautionary basis, the section of the River Lea within the area subject to the amendment is assumed to be used by water vole. The assumed water vole population is of up to district/borough value.
- 5.6.28 The main ES, as amended by SES₁, reported at least 11 social groups of badgers, identified through field surveys, throughout the Whitmore Heath to Madeley area. The area subject to the amendment includes suitable sett building and foraging habitats for badgers. The badger populations throughout the Whitmore Heath to Madeley area are of local/parish value.
- 5.6.29 The main ES reported populations of other mammals including polecat, harvest mouse, European hedgehog and brown hare, identified through desk study records, as being potentially present throughout the Whitmore Heath to Madeley area. The area subject to the amendment includes suitable habitats for these species. If present, these populations are of local/parish value.
- 5.6.30 The main ES reported populations of common reptile species such as grass snake and slow-worm, as being potentially present at low numbers throughout the Whitmore Heath to Madeley area. Grass snake and slow-worm are both species of principal importance. Grass snake is also a conservation priority of the Staffordshire BAP. The area subject to the amendment includes suitable habitats for these species. If present, these populations are of local/parish value.

⁵⁸ Annex 2 of the EU's Habitats Directive (1992) lists priority species whose conservation requires the designation of Special Areas of Conservation (SAC).

Future environmental baseline

Construction (2020)

- 5.6.31 The future baseline for construction in 2020 remains unchanged from that reported in the main ES Volume 5: Appendix CT-004-000.

Effects arising during construction

Avoidance and mitigation measures

- 5.6.32 The assessment assumes implementation of the measures set out within the draft Code of Construction Practice (CoCP)⁵⁹.
- 5.6.33 No avoidance or mitigation measures additional to those reported in the main ES and draft CoCP are required.

Assessment of impacts and effects

Habitats

- 5.6.34 The main ES reported the loss of 1.9ha of broadleaved semi-natural woodland bordering the Stoke to Market Drayton Railway, which would result in a permanent adverse effect that is significant at the district/borough level. The amendment will not alter the extent of loss of broadleaved semi-natural woodland. The amendment will not give rise to new or different significant effects on the broadleaved semi-natural woodland along the Stoke to Market Drayton Railway and will not change the level of significance of the effects reported in the main ES.
- 5.6.35 On a precautionary basis, the main ES reported a loss of 22.7km of hedgerow habitats within the Whitmore Heath to Madeley area, which would result in a permanent adverse effect that is significant at district/borough level. The amendment will not alter the extent of loss of hedgerow. The amendment will not give rise to new or different significant effects on the hedgerow network within the Whitmore Heath to Madeley area and will not change the level of significance of the effects reported in the main ES.
- 5.6.36 The main ES reported the diversion, realignment and culverting of several watercourses within the Whitmore Heath to Madeley area, which would result in permanent adverse effects that are significant at up to the district/borough level. The amendment will result in the loss of up to 25m² of riverbank habitat to allow for construction of a temporary outfall where the pipe joins the River Lea. Habitat clearance will include the implementation of measures set out within the draft CoCP, which also include measures to protect the bed and banks from scour around the outfall. The amendment will not give rise to new or different significant effect on the River Lea and will not change the level of significance of the effects reported in the main ES.
- 5.6.37 It is not likely that any other effects on habitats of relevance at more than the local/parish level will occur as a result of the amendment. Additional local/parish level

⁵⁹ HS2 Ltd (2017). *High Speed Rail (West Midlands - Crewe) Environmental Statement*, Volume 5: Technical appendices, draft Code of Construction Practice (CT-003-000). Available online at <https://www.gov.uk/government/publications/draft-code-of-construction-practice-for-hs2-phase-2a>

effects arising from the AP2 revised scheme are listed in SES2 and AP2 ES Volume 5: Appendix EC-016-000.

Species

- 5.6.38 The main ES, as amended by SES1, reported the direct loss of roosts and a loss of foraging and commuting habitat used by the assemblage of bats associated with habitats between Hey Sprink and Barhill Wood, which would result in a permanent adverse effect that is significant at a county level. The amendment will not alter the extent of loss of habitats likely to be used by this bat assemblage. The amendment will not give rise to new or different significant effects on the assemblage of bats associated with habitats between Hey Sprink and Barhill Wood, and will not change the level of significance of the effects reported in the main ES.
- 5.6.39 The main ES reported the presence of otter on the River Lea and tributaries, however no significant effect upon this population was reported. The amendment will result in the loss of up to 25m² of riverbank habitat to allow for construction of a temporary outfall where the pipe joins the River Lea. The precise location of the outfall would avoid any potential places of shelter for otter and bankside vegetation clearance would include the measures set out within the draft CoCP. The amendment will not give rise to a new significant effect on the otter population using the River Lea.
- 5.6.40 The main ES reported the potential presence of water vole on the River Lea and tributaries, however no significant effect upon this assumed population was reported. The amendment will result in the loss of up to 25m² of riverbank habitat to allow for construction of a temporary outfall where the pipe joins the River Lea. The precise location of the outfall would avoid any potential places of shelter for water vole and bankside vegetation clearance would include the measures set out within the draft CoCP. The amendment will not give rise to a new significant effect on the assumed water vole population using the River Lea.
- 5.6.41 It is not likely that any other effects on species of relevance at more than the local/parish level will occur as a result of the amendment. Additional local/parish level effects arising from the AP2 revised scheme are listed in SES2 and AP2 ES Volume 5: Appendix EC-016-000.

Mitigation and residual effects

Other mitigation measures

- 5.6.42 No mitigation measures additional to those reported in the main ES and draft CoCP are required.

Summary of likely residual significant effects

- 5.6.43 The significant effects of the amendment in this area are unchanged from those reported in the main ES as amended by SES1.

Cumulative effects

- 5.6.44 There are no new or different likely significant cumulative effects for ecology and biodiversity as a result of the amendment acting in combination with any other AP2 amendments.

5.7 Change to Bill powers for HS2 maintenance access to River Lea viaduct (AP2-004-006)

- 5.7.1 The Bill provides for an existing farm track to be upgraded to provide HS2 with a right of access from Manor Road to a turning head and maintenance access point, adjacent to the northern abutment of the River Lea viaduct. An area of hedgerow and grassland habitat creation (0.2ha) would be provided around two existing ponds in the adjacent field to the north of the access track. During construction, the area between the HS2 maintenance access and the area of habitat creation would be used as a temporary material stockpile. See Map CT-06-232, G10 to F7, in the main ES Volume 2, CA4 Map Book.
- 5.7.2 Since submission of the Bill, a requirement has been identified to improve junction visibility splays for vehicles accessing Manor Road from the proposed HS2 maintenance access. The junction of the HS2 maintenance access with Manor Road will be relocated approximately 350m north-west of the junction included in the original scheme. The HS2 maintenance access will be re-located to follow a field boundary to the north of the existing track, and as a result the area of the temporary material stockpile will be slightly reduced. Approximately 745m of hedgerow habitat creation will be provided along both sides of the relocated HS2 maintenance access, which will replace the hedgerow habitat creation in the original scheme. There will be a net gain of 520m in the provision of hedgerow habitat creation as a result of this amendment. The area of grassland habitat creation provided in the original scheme will be increased by 0.2ha to 0.4ha. See Map CT-06-232, F7 to E7, in the SES2 and AP2 ES Volume 2, CA4 Map Book.
- 5.7.3 This amendment will be constructed over a period of three months, commencing in 2024. Works will be managed from the River Lea viaduct satellite compound.
- 5.7.4 The relocation of the HS2 maintenance access will require new permanent powers for provision of the access. See Map CT-06-232, E8 to G6 in the SES2 and AP2 ES Volume 2, CA4 Map Book.

Topics included in the AP2 assessment

- 5.7.5 This AP2 amendment is considered to require reassessment of environmental effects and mitigation in the main ES, as amended by SES1 and SES2, for the following topics: community; and landscape and visual.

Community

Scope, assumptions and limitations

- 5.7.6 The assessment scope, key assumptions and limitations for community are as set out in Volume 1, the Scope and Methodology Report (SMR)⁶⁰ and the SMR Addendum⁶¹ of the main ES.
- 5.7.7 This amendment has the potential to result in new or different significant construction effects only. Therefore, there is no operational assessment for community.

Existing environmental baseline

- 5.7.8 The baseline community information for the area is described in Volume 2, CA4, Section 6 of the main ES.
- 5.7.9 The area is predominantly rural, made up of a few small settlements with limited community facilities. Madeley Park Wood is a village located along Manor Road to the west of Whitmore Wood, with approximately 145 residential properties. Madeley is a village located along the A525 Bar Hill Road with approximately 1,595 residential properties. The village provides a number of community facilities, including three schools, a church, a community centre, post office and a number of convenience stores.

Future environmental baseline

Construction (2020)

- 5.7.10 The future baseline for construction in 2020 remains unchanged from that reported in the main ES Volume 5: Appendix CT-004-000.

Effects arising during construction

Avoidance and mitigation measures

- 5.7.11 No avoidance or mitigation measures additional to those reported in the main ES and draft Code of Construction Practice (CoCP)⁶² are required.

Assessment of impacts and effects

- 5.7.12 The amendment to the HS2 maintenance access to River Lea viaduct was not included in the original scheme and therefore the main ES did not report any significant in-combination effects associated with it. This amendment has been assessed for potential visual effects to determine if these give rise to a new significant in-combination effect on community resources in this area. The assessment has

⁶⁰ HS2 Ltd (2017). *High Speed Rail (West Midlands - Crewe) Environmental Statement*, Volume 5: Technical appendices, Environmental Impact Assessment Scope and Methodology Report (Appendix CT-001-001). Available online at: <https://www.gov.uk/government/publications/scope-and-methodology-report-for-hs2-phase-2a>

⁶¹ HS2 Ltd (2017). *High Speed Rail (West Midlands - Crewe) Environmental Statement*, Volume 5: Technical appendices, Environmental Impact Assessment Scope and Methodology Report Addendum (Appendix CT-001-002). Available online at: <https://www.gov.uk/government/publications/scope-and-methodology-report-for-hs2-phase-2a>

⁶² HS2 Ltd (2017). *High Speed Rail (West Midlands - Crewe) Environmental Statement*, Volume 5: Technical appendices, draft Code of Construction Practice (CT-003-000). Available online at <https://www.gov.uk/government/publications/draft-code-of-construction-practice-for-hs2-phase-2a>

concluded that this amendment will not give rise to any new likely residual significant effects.

Cumulative effects

- 5.7.13 There are no new or different likely significant cumulative effects for community as a result of the amendment acting in-combination with any other AP2 amendments.

Landscape and visual

Scope, assumptions and limitations

- 5.7.14 The assessment scope, key assumptions and limitations for landscape and visual are as set out in Volume 1, the SMR and SMR Addendum of the main ES.
- 5.7.15 The amendment has the potential to result in new or different significant construction effects for visual only. Therefore, there is no construction assessment for landscape and no operation assessment for landscape and visual.

Existing environmental baseline

- 5.7.16 The baseline landscape and visual information for the Whitmore Heath to Madeley area is as described in Volume 2, CA4, Section 11 of the main ES.

Visual baseline

- 5.7.17 The amendment to change the HS2 maintenance access to River Lea viaduct has the potential to affect one viewpoint, which is described in Volume 5: LV-001-004 of the main ES and summarised below.

View south-east from Manor Road near Manor Cottages (viewpoint 022.02.004)

- 5.7.18 This viewpoint is representative of views experienced by residents at Manor Cottages, Manor Farm and road users. The view comprises an area of large open and gently undulating pastures bounded mainly by post and wire fencing and small sections of hedgerow with copses of trees. The West Coast Main Line (WCML) and associated overhead line equipment is visible running along the valley floor into the far distance. A wooded ridge to the opposite side of the valley defines the skyline.

Future baseline

Construction (2020)

- 5.7.19 The future baseline for construction in 2020 remains unchanged from that reported in the main ES Volume 5: Appendix CT-004-000.

Temporary effects arising during construction

Avoidance and mitigation measures

- 5.7.20 No avoidance or mitigation measures additional to those reported in the main ES and draft CoCP are required.

Assessment of impacts and effects

View south-east from Manor Road near Manor Cottages (viewpoint 022.02.004)

- 5.7.21 The main ES reported a major adverse significant effect due to the extensive construction activity associated with River Lea viaduct, Lea North embankment, Manor Road realignment and overbridge, and the presence of the River Lea viaduct satellite compound and material stockpiles.
- 5.7.22 The construction activity will be of a similar scale to the original scheme. The amendment to change the HS2 maintenance access to River Lea viaduct will bring construction activity slightly closer to the viewpoint compared to the original scheme, making it more noticeable and slightly increasing the effects on the view. The amendment will therefore give rise to a different significant effect. However, the level of significance of the effect will remain major adverse significant as reported in the main ES.
- 5.7.23 For further information see SES2 and AP2 ES Volume 5: Appendix LV-001-004 and SES2 and AP2 ES Volume 5: Landscape and visual Map Book.

Mitigation and residual effects

Other mitigation measures

- 5.7.24 No mitigation measures additional to those identified in the main ES and draft CoCP are identified.

Summary of likely residual significant effects

- 5.7.25 The temporary residual significant effect during construction will remain as described above. This effect will be temporary and reversible in nature lasting only for the duration of the construction works. This residual effect will generally arise from the widespread presence of construction activity and construction plant within the landscape and viewed by surrounding residents, and users of public rights of way (PRoW) and main roads within the study area.
- 5.7.26 After implementation of construction phase mitigation, the amendment to modify the HS2 maintenance access to River Lea viaduct will give rise to a different likely residual significant construction visual effect at residential properties associated with the view south-east from Manor Road near Manor Cottages (viewpoint 022.02.004). However, the level of significance will remain major adverse as reported in the main ES.

Cumulative effects

- 5.7.27 There are no new or different likely significant cumulative effects for landscape and visual as a result of the amendment acting in combination with any other AP2 amendments.

Summary of new or different likely residual effects as a result of the amendment

- 5.7.28 The amendment will give rise to a different likely residual significant construction effect at viewpoint 022.02.004. However, the significant effect at this viewpoint will remain as reported in the main ES.

5.8 Additional land required for provision of a power supply to Madeley tunnel (AP2-004-007)

- 5.8.1 The Bill provides for a twin bore tunnel, 673m in length and up to 38m in depth, extending under Bar Hill. See Map CT-06-233, D5 to A6, and Map CT-06-234, J5 to I6, in the main ES Volume 2, CA4 Map Book.
- 5.8.2 A tunnel boring machine (TBM) will be used to bore the tunnel. The TBM will be driven from the Madeley tunnel (south) tunnelling facility and logistics area. Power connections will be required to provide power to the Madeley tunnel (south) satellite compound and operate the TBM for the construction of the Madeley tunnel. The power connection will be retained permanently to be used for the operation of the tunnel, including lighting and ventilation systems.
- 5.8.3 It was originally proposed that the power supply would be provided by the statutory electricity undertaker, but in order to provide certainty that the scheme can be implemented within the construction programme it is necessary to include powers within the Bill.
- 5.8.4 Since submission of the Bill, further design development has been undertaken to identify a route for a power line, consisting of two sets of three 33kV cables to ensure necessary supply resilience, laid underground in a single trench and approximately 11.5km in length, to supply power to the TBM for the construction of Madeley tunnel. The power line will also provide a permanent power supply for the operation of the lighting, communications, signalling and ventilation systems of the tunnel.
- 5.8.5 The power line will be installed in the verge or carriageway of existing roads, except for the following locations:
- a 100m length which will cross beneath the West Coast Main Line (WCML) and the River Lea. See Map CT-05-233, I3 to I1, and Map CT-05-233-R1, I10, in the SES2 and AP2 ES Volume 2, CA4 Map Book; and
 - a 300m length which will be installed in an HS2 access road to Madeley tunnel southern porous portal. See Map CT-05-233, F5 to E5, in the SES2 and AP2 ES Volume 2, CA4 Map Book.
- 5.8.6 The power line will originate at an existing Western Power Distribution sub-station, referred to as Newcastle Bulk Supply Point, located along Brymbo Road to the north of Newcastle-under-Lyme and to the east of the HS2 route. New 33kV circuit breakers and 132kV control panels will be installed at Newcastle Bulk Supply Point, which will be housed in a new building approximately 35m x 35m. New 132/33kV transformers will also be installed and existing infrastructure will be modified to accommodate the new connection.

- 5.8.7 The route of the power line will run east along Brymbo Road to the junction with the A34 Liverpool Road, before being routed south along the A34 Liverpool Road to the junction with the B5368 Lower Milehouse Lane. At this location the power line will run south-west along the B5368 Lower Milehouse Lane to the junction with the B5367 High Street and will then run south-west along the B5367 High Street to the junction with the B5367 Knutton Lane and the B5368 Church Lane. See Map CT-05-233-R7, I10 to E3, and Map CT-05-233-R6, H1 to I7, in the SES2 and AP2 ES Volume 2, CA4 Map Book.
- 5.8.8 The power line will run along the B5368 Church Lane to the junction with the B5044 Newcastle Street and will then run west along the B5044 Newcastle Street to the junction with Mill Street. At this location the power line will run along Mill Street/High Street to the junction with B5044 Pepper Street and will then run west along Pepper Street to the junction with the A525 Station Road/A525 Keele Road/A525 Newcastle Road.
- 5.8.9 The power line will run west along the A525 Station Road/A525 Keele Road/A525 Newcastle Road, crossing the M6 within an existing underbridge, then south-west along the A525 Newcastle Road and then south along the A525 Poolside/A525 Woore Road/A525 Bar Hill to the junction with Station Road. See Map CT-05-233-R6, H7 to G10, Map CT-05-233-R5, G1 to A10, Map CT-05-233-R4, F10 to G1, Map CT-05-233-R3, C10 to G1, Map CT-05-233-R2, H1 to E10, and Map CT-05-233-R1, G10 to E1, in the SES2 and AP2 ES Volume 2, CA4 Map Book.
- 5.8.10 Approaching the WCML, the power line will run south along Station Road to the end of the road, adjacent to the WCML. The power line will be ducted beneath the WCML and the River Lea, using directional drilling. Two areas of agricultural land either side of the WCML, each approximately 300m², will be temporarily required to facilitate the directional drilling beneath the WCML and the River Lea. Access via Netherset Hey Lane will be required for operatives and occasionally plant during the directional drilling. A 0.2ha area of wetland habitat creation to mitigate loss of habitat during construction of the power line will be provided east of the WCML, between Station Road and the River Lea. Madeley Footpath 33 will be temporarily closed during construction. See Map CT-05-233, I1 to H1, and Map CT-05-233-R1, I10 to G9, in the SES2 and AP2 ES Volume 2, CA4 Map Book.
- 5.8.11 Following the crossing of the WCML and the River Lea the power line will run north-east along Manor Road to the junction with the A525 Bar Hill, before being routed south-west along the A525 Bar Hill to the junction with a HS2 access road. At this location the power line will then run along this access road and connect into the southern porous portal of Madeley tunnel. See Map CT-05-233, I3 to E5, in the SES2 and AP2 ES Volume 2, CA4 Map Book.
- 5.8.12 The amendment will be constructed over a period of approximately six months, commencing in 2022. Works will be managed from Madeley tunnel (south) satellite compound, with mobile staff welfare units.
- 5.8.13 The land required for the installation of the power line is outside the limits of the Bill and will result in the requirement for an additional 18.4ha of land. See Maps CT-05-223, CT-05-223-R1, CT-05-223-R2, CT-05-223-R3, CT-05-223-R4, CT-05-223-R5, CT-05-223-R6, CT-05-223-R7 and CT-05-223-R8 in the SES2 and AP2 ES Volume 2,

CA4 Map Book. It is assumed that all of the additional land will be returned to its existing use following construction.

Topics included in the AP2 assessment

- 5.8.14 This amendment is considered to require reassessment of the environmental effects and mitigation in the main ES; as amended by SES1 and SES2; for the following topics: community; cultural heritage; landscape and visual; sound, noise and vibration; traffic and transport; and water resources and flood risk.

Community

Scope, assumptions and limitations

- 5.8.15 The assessment scope, key assumptions and limitations for community are as set out in Volume 1, the Scope and Methodology Report (SMR)⁶³ and the SMR Addendum⁶⁴ of the main ES.
- 5.8.16 This amendment has the potential to result in new or different significant construction effects only. Therefore, there is no operational assessment for community.

Existing environmental baseline

- 5.8.17 The baseline community information for the Whitmore Heath to Madeley area is as described in Volume 2, CA4, Section 6 of the main ES.
- 5.8.18 The area is characterised by small clusters of dwellings and individual dwellings within rural areas. Madeley is a village located along the A525 Bar Hill Road with approximately 1,595 residential properties. The village provides a number of community facilities, including three schools, a church, a community centre, post office and a number of convenience stores.

Future environmental baseline

Construction (2020)

- 5.8.19 The future baseline for construction in 2020 remains unchanged from that reported in the main ES Volume 5: Appendix CT-004-000.

Effects arising during construction

Avoidance and mitigation measures

- 5.8.20 No avoidance or mitigation measures additional to those reported in the main ES and draft Code of Construction Practice (CoCP)⁶⁵ are required.

⁶³ HS2 Ltd (2017). *High Speed Rail (West Midlands - Crewe) Environmental Statement*, Volume 5: Technical appendices, Environmental Impact Assessment Scope and Methodology Report (Appendix CT-001-001). Available online at: <https://www.gov.uk/government/publications/scope-and-methodology-report-for-hs2-phase-2a>

⁶⁴ HS2 Ltd (2017). *High Speed Rail (West Midlands - Crewe) Environmental Statement*, Volume 5: Technical appendices, Environmental Impact Assessment Scope and Methodology Report Addendum (Appendix CT-001-002). Available online at: <https://www.gov.uk/government/publications/scope-and-methodology-report-for-hs2-phase-2a>

⁶⁵ HS2 Ltd (2017). *High Speed Rail (West Midlands - Crewe) Environmental Statement*, Volume 5: Technical appendices, draft Code of Construction Practice (CT-003-000). Available online at <https://www.gov.uk/government/publications/draft-code-of-construction-practice-for-hs2-phase-2a>

Assessment of impacts and effects

- 5.8.21 The power supply to the TBM for Madeley tunnel was not included in the original scheme and therefore the main ES did not report any significant in-combination effects associated with it. This amendment has been assessed for potential visual, noise and heavy goods vehicle (HGV) effects to determine if these give rise to a new significant in-combination effect on community resources in this area. The assessment has concluded that this amendment will not give rise to any new likely residual significant effects.

Cumulative effects

- 5.8.22 There are no new or different likely significant cumulative effects for community as a result of the amendment acting in-combination with any other AP2 amendments.

Cultural heritage

Scope, assumptions and limitations

- 5.8.23 The assessment scope, key assumptions and limitations for cultural heritage are as set out in Volume 1, the SMR and SMR Addendum of the main ES and SMR Addendum 2 (see SES2 and AP2 ES Volume 5: Appendix CT-001-000).
- 5.8.24 The amendment has the potential to result in new or different significant temporary construction effects only. Therefore, there is no permanent construction or operational assessment for cultural heritage.

Existing environmental baseline

- 5.8.25 The baseline cultural heritage information for the Whitmore Heath to Madeley area is as described in Volume 2, CA4, Section 7 of the main ES.
- 5.8.26 Old Hall, Madeley (WHMo57), a Grade II* listed building, a designated asset of high value, is located adjacent to the land required for the amendment.
- 5.8.27 The amendment will be constructed in proximity to five designated assets of moderate value, which comprise:
- Madeley War Memorial, located on the A525 Newcastle Road north of Madeley (WHMo37), a Grade II listed building, located adjacent to the land required for the amendment;
 - a milepost, located on the A525 Newcastle Road north of Madeley (WHMo39), a Grade II listed building, located adjacent to the land required for the amendment;
 - a 16th century town house, located on Station Road on the east side of Madeley (WHMo44), a Grade II listed building, located adjacent to the land required for the amendment;
 - Offley Almshouses located on Station Road (WHMo45), a Grade II listed building, located adjacent to the land required for the amendment; and
 - The Old Vicarage (WHMo84), a locally listed building, located adjacent to the land required for the amendment.

- 5.8.28 Madeley Conservation Area (WHMo56), a designated asset of moderate value, lies partially within the land required for the amendment
- 5.8.29 Further information about these assets is provided in the main ES Volume 5: Appendix CH-002-004 and Map Series CH-01, CH-02 and in the main ES Volume 5: Cultural heritage Map Book.

Future environmental baseline

Construction (2020)

- 5.8.30 The future baseline for construction in 2020 remains unchanged from that reported in the main ES Volume 5: Appendix CT-004-000.

Effects arising during construction

Avoidance and mitigation measures

- 5.8.31 No avoidance or mitigation measures additional to those reported in the main ES and draft CoCP are identified.

Assessment of impacts and effects

- 5.8.32 The main ES reported a temporary minor adverse effect, which is not significant, due to a change in the setting of Madeley Conservation Area (WHMo56), a designated asset of moderate value. Construction activities associated with the installation of the TBM power supply will impact on the character and appearance of the area and will further affect the setting of the conservation area. This will give rise to a new temporary medium adverse impact and a new temporary moderate adverse effect, which is significant.
- 5.8.33 The main ES reported a temporary minor adverse effect, which is not significant, on the Grade II listed 16th century town house, Madeley (WHMo44), a designated asset of moderate value. Construction activities associated with the installation of the TBM power supply will further affect the rural setting of the asset. This will give rise to a new temporary medium adverse impact and a new temporary moderate adverse effect, which is significant.
- 5.8.34 The main ES reported a temporary minor adverse effect, which is not significant, on the Grade II listed Offley Almshouses (WHMo45), a designated asset of moderate value. Construction activities associated with the installation of the TBM power supply will further affect the rural setting of the asset. This will give rise to a new temporary medium adverse impact and a new temporary moderate adverse effect, which is significant.
- 5.8.35 The main ES reported a temporary minor adverse effect, which is not significant, on the Grade II* listed Old Hall, Madeley (WHMo57), a designated asset of high value. Construction activities associated with the installation of the TBM power supply will further affect the rural setting of the asset. This will give rise to new temporary medium adverse impact and a new temporary moderate adverse effect, which is significant.
- 5.8.36 For further information see the SES2 and AP2 ES Volume 5: Cultural heritage Map Book and the SES2 and AP2 ES Volume 5: Appendix CH-003-000.

Mitigation and residual effects

Other mitigation measures

- 5.8.37 No mitigation measures additional to those reported in the main ES and draft CoCP are identified.

Summary of likely residual significant effects

- 5.8.38 The temporary effects of construction activity on the setting of heritage assets have been considered. However, they are largely reversible in nature and will be restricted to the duration of the construction works. The amendment will not change the level of significance of the residual effects reported in the main ES.

Cumulative effects

- 5.8.39 The amendment in combination with the new permanent Severn Trent Water water mains supply to the Madeley tunnel south portal building (AP2-004-106) and the new permanent diversion of a Severn Trent Water mains supply at the A525 Bar Hill Road (AP2-004-105) will increase the impact on the setting of the Grade II listed 16th century town house, Madeley (WHM044) and the Grade II listed Offley Almshouses (WHM045).
- 5.8.40 No mitigation measures additional to those reported in the main ES and draft CoCP have been identified.
- 5.8.41 This will give rise to a new moderate adverse cumulative temporary significant effect, compared with the main ES. However, this will not change the overall significance of the effect on the assets as a result of the AP2 amendment.

Landscape and visual

Scope, assumptions and limitations

- 5.8.42 The assessment scope, key assumptions and limitations for landscape and visual are as set out in Volume 1, the SMR and SMR Addendum of the main ES.
- 5.8.43 The amendment has the potential to result in new or different significant construction effects for visual only. The amendment will introduce new construction activity into the landscape, including into an area which would be unaffected by the original scheme. This construction activity will, however, be small in scale and of short duration and will not be an uncharacteristic activity in the landscape as similar utilities work is routinely present in the area. There will therefore be no effect on landscape character. During operation, the power supply will be underground and will not be visible in the landscape. Therefore, there is no construction assessment for landscape and no operational assessment for landscape and visual.

Existing environmental baseline

- 5.8.44 The baseline landscape and visual information for the Whitmore Heath to Madeley area is as described in Volume 2, CA4, Section 11 of the main ES.

Visual baseline

- 5.8.45 The amendment to provide a power supply to Madeley tunnel has the potential to affect one viewpoint, which is described in Volume 5: LV-001-004 of the main ES and summarised below.

View south from A525 Bar Hill Road (viewpoint 022.02.012)

- 5.8.46 Residents of properties along the A525 Bar Hill Road currently have oblique views across the road which is bounded by robust roadside hedgerows, towards flat pastures with former field boundary trees and copses. There is little other built development in the view besides Bar Hill House Farm and some large farm sheds. Views are contained in the middle distance by intervening vegetation and rising landform.

Future baseline

Construction (2020)

- 5.8.47 The future baseline for construction in 2020 remains unchanged from that reported in the main ES Volume 5: Appendix CT-004-000.

Temporary effects arising during construction

Avoidance and mitigation measures

- 5.8.48 No avoidance or mitigation measures additional to those reported in the main ES and draft CoCP are required.

Assessment of impacts and effects

View south from A525 Bar Hill Road (viewpoint 022.02.012)

- 5.8.49 The main ES reported a major adverse significant effect due to the scale and proximity of the construction activity associated with Madeley Bridleway 1 accommodation green overbridge, A525 Bar Hill Road realignment and overbridge, and Madeley cutting and associated earthworks. There will also be views of Madeley tunnel (south) satellite compound, material stockpiles, the presence of construction equipment and movement of construction vehicles. Views of hedged pastures with tree copses either side of the A525 Bar Hill Road will be replaced by large scale construction activity with new features that form prominent and uncharacteristic elements in the views. The landform changes will be very apparent as will removal of hedgerows along the A525 Bar Hill Road and tree removal within Barhill Wood.
- 5.8.50 The amendment to provide a TBM power supply to Madeley tunnel will introduce new construction activities into the view, however, these will be minimal when seen alongside the wider construction activity in this area, which will be extensive. The amendment will therefore not give rise to any new or different significant effects and will not change the level of significance of the effects reported in the main ES.
- 5.8.51 For further information see SES2 and AP2 ES Volume 5: Appendix LV-001-004 and SES2 and AP2 ES Volume 5: Landscape and visual Map Book.

Cumulative effects

- 5.8.52 There are no new or different likely significant cumulative effects for landscape and visual as a result of the amendment acting in combination with any other AP2 amendments.

Sound, noise and vibration

Scope, assumptions and limitations

- 5.8.53 The assessment scope, key assumptions and limitations for sound, noise and vibration are as set out in Volume 1 and the SMR of the main ES.
- 5.8.54 This amendment has the potential to result in new or different significant construction effects only. Therefore, there is no operational assessment for sound, noise and vibration.

Existing environmental baseline

- 5.8.55 The existing baseline sound and vibration information for the Whitmore Heath to Madeley area is described in Volume 2, CA4, Section 13 of the main ES. Baseline sound levels representative of the assessment locations affected by the amendment have been used in the construction and operational assessment.
- 5.8.56 The majority of the works associated with the amendment are transient daytime construction activities which do not remain close to receptors for a period of more than one month. However, there is the potential for works of longer duration close to the residential properties on Station Road, Madeley. The existing baseline at this area is dominated by traffic noise from local and distant road traffic, including the A525 Bar Hill Road and the WCML.

Future environmental baseline

Construction (2020)

- 5.8.57 The future baseline for construction in 2020 remains unchanged from that reported in the main ES Volume 5: Appendix CT-004-000.

Effects arising during construction

Avoidance and mitigation measures

- 5.8.58 No avoidance or mitigation measures additional to those reported in the main ES and draft CoCP are required.

Assessment of impacts and effects

- 5.8.59 The main ES did not identify any likely construction noise or vibration significant effects in the area close to this amendment. An assessment has been undertaken to determine whether the construction noise or vibration levels as a result of the amendment, will result in a new or different likely significant effect, using the significance criteria detailed in the main ES (Volume 5: Appendix SV-001-000).
- 5.8.60 The assessment has considered the construction noise and vibration levels associated with the amendment (in particular the directional drilling works under the WCML).

The amendment will give rise to a new significant effect on a community basis at approximately 15 residential properties on Station Road, Madeley, for a duration of up to two months (reference CSVo4-Co6). For further information, see SES2 and AP2 ES Volume 5: Appendix SV-002-000.

Mitigation and residual effects

Other mitigation measures

- 5.8.61 No mitigation measures additional to those reported in the main ES and draft CoCP are identified.

Summary of likely residual significant effects

- 5.8.62 The amendment will give rise to a new likely residual significant construction noise effect on a community basis at residential properties on Station Road, Madeley for a duration of up to two months.

Cumulative effects

- 5.8.63 There are no new or different likely significant cumulative effects for sound, noise and vibration as a result of the amendment acting in combination with any other AP2 amendments.

Traffic and transport

Scope, assumptions and limitations

- 5.8.64 The assessment scope, key assumptions and limitations for traffic and transport are as set out in Volume 1, the SMR and SMR Addendum of the main ES.
- 5.8.65 This amendment has the potential to result in new or different significant construction effects only. Therefore, there is no operational assessment for traffic and transport.
- 5.8.66 The assessment of the changes to construction traffic flows as a result of this amendment in combination with all SES2 changes and AP2 amendments is reported in Section 7.

Existing environmental baseline

- 5.8.67 The baseline traffic and transport information for the Whitmore Heath to Madeley area is as described in Volume 2 CA4, Section 14 of the main ES.
- 5.8.68 The M6 traverses the centre of the area along a north to south alignment. The main roads in the area that are relevant to the assessment of the amendment are the A34 Liverpool Road, between Brymbo Road and B5368 Lower Milehouse Lane, and the A525 Station Road/Keele Road/Newcastle Road/Poolside/Woore Road/Bar Hill through Madeley Heath and Madeley, between B5044 Pepper Street and Station Road. The main road network is well used at peak times and delays can be experienced.
- 5.8.69 The local roads in the area that are relevant to the assessment of the amendment are: Brymbo Road; the B5368 Lower Milehouse Lane, between the A34 Liverpool Road and the B5367 High Street through Knutton; the B5367 High Street, between the B5368 Lower Milehouse Lane and the B5368 Church Lane through Knutton; the B5368

Church Lane, between the B5367 High Street and the B5044 Newcastle Street through Knutton; the B5044 Newcastle Street, between the B5368 Church Lane and Mill Street; Mill Street, between the B5044 Newcastle Street and Racecourse; High Street, between Racecourse and the B5044 Pepper Street through Silverdale; and the B5044 Pepper Street, between High Street and the A525 Station Road. The local road network in this area generally operates well although some localised delays can be experienced particularly at peak times where local roads meet the main road network.

Future environmental baseline

Construction (2023)

- 5.8.70 The future baseline for construction in 2023 remains unchanged from that reported in the main ES Volume 5: Appendix CT-004-000.

Effects arising during construction

Avoidance and mitigation measures

- 5.8.71 No avoidance or mitigation measures additional to those reported in the main ES draft CoCP are required.

Assessment of impacts and effects

- 5.8.72 The amendment will require works in or adjacent to the carriageway which will be undertaken through local traffic management measures. Local traffic management measures are likely to include lane restrictions with shuttle working⁶⁶ (off-peak where reasonably practicably) and temporary lane closures. Where lane closures are required, these will typically be of a short duration (less than four weeks) and access to properties will be maintained with defined diversion routes.
- 5.8.73 Whilst construction of the amendment in isolation in any location will not result in any significant effect on traffic congestion and delays, there will be some congestion and delays to vehicle occupants, including bus occupants, of roads associated with the amendment when considered in combination. Given the overall duration of the works this will result in a new temporary minor adverse effect, which is significant, on vehicle users of: the B5368 Lower Milehouse Lane and the B5368 Church Lane through Knutton; Mill Street, High Street and the B5044 Pepper Street through Silverdale; and the A525 Newcastle Road through Madeley Heath and Madeley.

Mitigation and residual effects

Other mitigation measures

- 5.8.74 No mitigation measures, additional to those reported in the main ES and draft CoCP, are required.

⁶⁶ Shuttle working means an area of carriageway where, owing to a temporary restriction, traffic has to flow first in one direction then in the other in a controlled manner. The definition is contained in: Department for Transport/Highways Agency (2009). *Traffic Signs Manual, Chapter 8, Traffic Safety Measures and Signs for Road Works and Temporary Situations*, Part 1: Design, p. 298. Available online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/203669/traffic-signs-manual-chapter-08-part-01.pdf

Summary of likely residual significant effects

- 5.8.75 The amendment will give rise to a new likely residual significant temporary minor adverse effect on vehicle users of: the B5368 Lower Milehouse Lane and the B5368 Church Lane through Knutton; Mill Street, High Street and the B5044 Pepper Street through Silverdale; and the A525 Newcastle Road through Madeley Heath and Madeley, as a result of the additional delay on traffic flows and delays to vehicle occupants.

Cumulative effects

- 5.8.76 There are no new or different likely significant cumulative effects for traffic and transport as a result of the amendment acting in combination with any other AP2 amendments or any relevant committed development.

Water resources and flood risk

Scope, assumptions and limitations

- 5.8.77 The assessment scope, key assumptions and limitations for water resources and flood risk are as set out in Volume 1, the SMR and SMR Addendum of the main ES and SMR Addendum 2 (see SES2 and AP2 ES Volume 5: Appendix CT-001-000).
- 5.8.78 This amendment has the potential to result in new or different significant construction effects only. Therefore, there is no operational assessment for water resources and flood risk.

Existing environmental baseline

- 5.8.79 The baseline water resources information for the Whitmore Heath to Madeley area is as described in Volume 2, CA4, Section 15 of the main ES. Further details relating to water resources and flood risk for this area are provided in Volume 5: Appendix WR-002-004 and Appendix WR-003-004 and the main ES Volume 5 Water resources and flood risk Map Book.
- 5.8.80 This amendment passes through areas of source protection zone associated with groundwater abstractions used for public water supply. It is also located in the vicinity of a number of surface watercourses including the River Lea, Hazeley Brook, Lyme Brook and Ashfield Brook. This amendment will involve construction activities of a nature and scale that have potential water quality implications.

Future environmental baseline

Construction (2020)

- 5.8.81 The future baseline for construction in 2020 remains unchanged from that reported in the main ES Volume 5: Appendix CT-004-000.

Effects arising during construction

- 5.8.82 The main ES reported no significant effects on surface water quality due to site runoff and increased pollution risk in the vicinity of this amendment. The amendment has the potential to give rise to temporary adverse impacts on surface water quality which could affect the water environment. However, the amendment will be constructed in

accordance with the measures specifically designed to safeguard water resources outlined in the draft CoCP.

- 5.8.83 Therefore, the amendment will not give rise to a new or different significant effect and will not change the level of significance of the effects reported in the main ES.

Cumulative effects

- 5.8.84 There are no new or different likely significant cumulative effects for water resources and flood risk as a result of the amendment acting in combination with any other AP2 amendments.

Summary of new or different likely residual effects as a result of the amendment

- 5.8.85 Construction of the amendment, in particular directional drilling under the WCML, will give rise to a new likely residual significant construction noise effect on a community basis at residential properties on Station Road, Madeley.
- 5.8.86 The amendment will give rise to a new likely residual temporary minor adverse significant effect on vehicle users of: B5368 Lower Milehouse Lane and the B5368 Church Lane, through Knutton; Mill Street, High Street and B5044 Pepper Street through Silverdale. This new significant effect is as a result of the additional delay on traffic flows and delays to vehicle occupants.

6 Assessment of minor utility amendments in the Whitmore Heath to Madeley area

6.1 Additional land and change in Bill powers for the diversion of a Cadent medium pressure gas main from Snape Hall Road to Common Lane and Heath Road (AP2-004-101)

- 6.1.1 Since submission of the Bill, further engagement with the utility provider has identified a need for additional land to permanently divert an existing Cadent medium pressure gas main in Snape Hall Road. The utility will be diverted 1.8km in length, along Common Lane and Heath Road and crossing the HS2 route above Whitmore Heath tunnel. See Map CT-06-230, G8 to C5, in the SES2 and AP2 ES Volume 2, CA4 Map Book.
- 6.1.2 The activities will require the removal of any surface material from the area of the diversion route (this may include vegetation, soil, and road surfacing), the removal of existing utility infrastructure (where necessary) and installation of the utility. As required and where suitable, topsoil will be temporarily stored adjacent to the working area and will be used to reinstate the area once the works are complete.
- 6.1.3 Activities to divert the utility are currently planned to be carried out in 2021-2022 and are expected to take approximately six months to complete.
- 6.1.4 The land required for this utility diversion is outside the limits of the Bill and will result in a requirement for approximately 0.8ha of additional land, some of which will be from Whitmore Hall Farm (CA4/1). See Map CT-06-230 G8 to D3 in the SES2 and AP2 ES Volume 2, CA4 Map Book. It is assumed that all of the additional land will be returned to its existing use following construction.
- 6.1.5 This amendment is considered to require reassessment of the environmental effects and mitigation in the main ES, as amended by SES1 and SES2, for the following topics: community and sound, noise and vibration.

Community

- 6.1.6 The additional land for the permanent diversion of a Cadent medium pressure gas main from Snape Hall Road to Common Lane and Heath Road was not included in the original scheme and therefore the main ES did not report any significant effects associated with it. This amendment has been assessed for potential noise effects to determine if these give rise to a new significant in-combination effect on community resources in this area. The assessment has concluded that this amendment will not give rise to any new likely residual significant effects.

Sound, noise and vibration

- 6.1.7 The main ES reported a likely significant construction airborne noise effect on the community at Whitmore Heath (ref.: CSV04-Co1) at approximately 15 properties on Snape Hall Road for a duration of up to four years and eight months. The assessment has considered the construction noise and vibration levels associated with the amendment and those identified in the main ES, the construction programme for the amendment and local mitigation identified in the main ES. The amendment will not

give rise to any new or different likely residual significant effects compared to those reported in the main ES.

6.2 Additional land for a new Severn Trent Water water mains supply to the Whitmore Heath tunnel north portal building (AP2-004-102)

- 6.2.1 The Bill provides for a new permanent Severn Trent Water water mains supply to the Whitmore Heath tunnel north portal building, 150m in length, from Snape Hall Road and along a proposed HS2 access track to the Whitmore Heath tunnel north portal building. See Map CT-06-231, J5 to I8 in the main ES Volume 2, CA4 Map Book.
- 6.2.2 Since submission of the Bill, further engagement with the utility provider has identified a need to change the alignment of the new water mains supply. The new water mains supply will be 480m in length, running along Whitmore Footpath 5 and a HS2 access track to the Whitmore Heath tunnel north portal building. See Map CT-06-230, A9 to B6, in the SES2 and AP2 ES Volume 2, CA4 Map Book.
- 6.2.3 The activities will require the removal of any surface material from the area of the connection route (this may include vegetation, soil, and road surfacing), the removal of existing utility infrastructure (where necessary) and installation of the utility. As required and where suitable, topsoil will be temporarily stored adjacent to the working area and will be used to reinstate the area once the works are complete.
- 6.2.4 Activities to construct the utility are currently planned to be carried out in 2021-2022 and are expected to take approximately six months to complete.
- 6.2.5 The land required for this utility is outside the limits of the Bill and will result in a requirement for approximately 0.5ha of additional land, some of which will be from Snape Hall Farm (CA4/6). See Map CT-06-230, A9 to B6 in the SES2 and AP2 ES Volume 2, CA4 Map Book. It is assumed that all of the additional land will be returned to its existing use following construction.
- 6.2.6 This amendment is not considered to require a reassessment of the environmental effects or mitigation within the Whitmore Heath to Madeley area, as set out in the main ES as amended by SES1 and SES2 with respect to any environmental topics.

6.3 Additional land and change in Bill powers for the overhead and underground diversion of a Western Power Distribution 11kV overhead line near Manor Farm (AP2-004-103)

- 6.3.1 The Bill provides for the permanent overhead and underground diversion of a Western Power Distribution 11kV overhead line, 710m in length, from an existing Western Power Distribution pole 270m south of Hey House, crossing the HS2 route 150m south of Manor Road overbridge to an existing pole 350m east of Manor Farm. The eastern section of the diversion, 460m in length, running parallel to the HS2 route would be an overhead line. The western section of the diversion, 250m in length, crossing the HS2 route would be an underground cable. See Map CT-06-232, G7 to E5 in the main ES Volume 2, CA4 Map Book.
- 6.3.2 Since submission of the Bill, further engagement with the utility provider has identified a need to change the alignment of the diversion. The underground and

overhead diversion will be 890m in total length, from an existing Western Power Distribution pole 270m south of Hey House, crossing the HS2 route 170m south of the Manor Road overbridge, running along a HS2 access track and crossing the Manor Road diversion to an existing Western Power Distribution pole east of Manor Farm. The eastern section of the diversion, 460m in length, running parallel to the HS2 route will be an overhead line. The western section of the diversion, 430m in length, crossing the HS2 route will be an underground cable. See Map CT-06-232, G7 to B5 in the SES2 and AP2 ES Volume 2, CA4 Map Book.

- 6.3.3 The activities will require the removal of any surface material from the area of the diversion route (this may include vegetation, soil, and road surfacing), the removal of existing utility infrastructure (where necessary) and installation of the utility. As required and where suitable, topsoil will be temporarily stored adjacent to the working area and will be used to reinstate the area once the works are complete.
- 6.3.4 Activities to divert the utility are currently planned to be carried out in 2021-2022 and are expected to take approximately six months to complete.
- 6.3.5 The land required for this utility diversion is outside the limits of the Bill and will result in a requirement for approximately 0.1ha of additional land, some of which will be from Manor Farm (CA4/10). See Map CT-06-232, D8 to D7 in the SES2 and AP2 ES Volume 2, CA4 Map Book. It is assumed that all of the additional land will be returned to its existing use following construction.
- 6.3.6 This amendment is considered to require reassessment of the environmental effects and mitigation in the main ES as amended by SES1 and SES2, for the following topics: community and sound, noise and vibration.

Community

- 6.3.7 The additional land for the permanent overhead and underground diversion of a Western Power Distribution 11kV overhead line near Manor Farm was not included in the original scheme and therefore the main ES did not report any significant effects associated with it. This amendment has been assessed for potential noise effects to determine if these give rise to a new significant in-combination effect on community resources in this area. The assessment has concluded that this amendment will not give rise to any new likely residual significant effects.

Sound, noise and vibration

- 6.3.8 In the area close to the amendment the main ES did not identify a residual likely significant sound, noise or vibration effect. The amendment has the potential to result in a new or different likely significant construction noise effects at residential properties in the vicinity of Manor Farm, Manor Way, Madeley.
- 6.3.9 The assessment has considered the construction noise and vibration levels associated with the amendment and those identified in the main ES, the construction programme for the amendment and local mitigation identified in the main ES. The amendment will not give rise to any new or different likely residual significant effects compared to those reported in the main ES.

6.4 Additional land for a new Severn Trent Water water mains supply to the Madeley tunnel north portal building (AP2-004-104)

- 6.4.1 The Bill provides for a new permanent Severn Trent Water water mains supply to the Madeley tunnel north portal building, 940m in length, from the access track to Moss Farm, running along Bower End Lane, Madeley Bridleway 5 realignment and the proposed HS2 access track to the Madeley tunnel north portal building. See Map CT-06-233, C2 to A5 and Map CT-06-234, J4 to G5 in the main ES Volume 2, CA4 Map Book.
- 6.4.2 Since submission of the Bill, further engagement with the utility provider has identified a need to change the alignment of the new water mains supply. The new water mains supply will be 2.4km in length, from 320m south of Station Road, running adjacent to Station Road and along the A525 Bar Hill Road, Moss Lane and Bower End Lane, crossing the WCML, and continuing along Bower End Lane, Madeley Bridleway 5 realignment and the HS2 access track to the Madeley tunnel north portal building. See Map CT-06-233, G1 to A5, Map CT-06-233-R1, G10 to D10, and Map CT-06-234, J4 to H5, in the SES2 and AP2 ES Volume 2, CA4 Map Book.
- 6.4.3 The activities will require the removal of any surface material from the area of the connection route (this may include vegetation, soil, and road surfacing), the removal of existing utility infrastructure (where necessary) and installation of the utility. As required and where suitable, topsoil will be temporarily stored adjacent to the working area and will be used to reinstate the area once the works are complete.
- 6.4.4 Activities to construct the utility are currently planned to be carried out in 2021-2022 and are expected to take approximately six months to complete.
- 6.4.5 The land required for this utility is outside the limits of the Bill and will result in a requirement for approximately 0.3ha of additional land. See Map CT-06-233, G1 to C2 in the SES2 and AP2 ES Volume 2, CA4 Map Book. It is assumed that all of the additional land will be returned to its existing use following construction.
- 6.4.6 This amendment is considered to require reassessment of the environmental effects and mitigation in the main ES as amended by SES1 and SES2, for the following topics: community and sound, noise and vibration.

Community

- 6.4.7 The additional land for a new permanent Severn Trent Water water mains supply to the Madeley tunnel north portal building was not included in the original scheme and therefore the main ES did not report any significant effects associated with it. This amendment has been assessed for potential noise effects to determine if these give rise to a new significant in-combination effect on community resources in this area. The assessment has concluded that this amendment will not give rise to any new likely residual significant effects.

Sound, noise and vibration

- 6.4.8 In the area close to the amendment the main ES did not identify a residual likely significant sound, noise or vibration effect. The amendment has the potential to result

in a new or different likely significant construction noise effects at residential properties in Madeley, in the vicinity of Moss Lane.

- 6.4.9 The assessment has considered the construction noise and vibration levels associated with the amendment and those identified in the main ES, the construction programme for the amendment and local mitigation identified in the main ES. The amendment will not give rise to any new or different likely residual significant effects compared to those reported in the main ES. For further information, see SES2 and AP2 ES Volume 5: Appendix SV-002-000.

6.5 Additional land for the diversion of a Severn Trent Water water mains supply at the A525 Bar Hill Road (AP2-004-105)

- 6.5.1 Since submission of the Bill, further engagement with the utility provider has identified the need for land to permanently divert a Severn Trent Water water mains supply at the A525 Bar Hill Road, 700m in length, crossing the HS2 route at the A525 Bar Hill overbridge. See Map CT-06-233, G7 to G1 in the SES2 and AP2 ES Volume 2, CA4 Map Book.
- 6.5.2 The activities will require the removal of any surface material from the area of the diversion route (this may include vegetation, soil, and road surfacing), the removal of existing utility infrastructure (where necessary) and installation of the utility. As required and where suitable, topsoil will be temporarily stored adjacent to the working area and will be used to reinstate the area once the works are complete.
- 6.5.3 Activities to divert the utility are currently planned to be carried out in 2021-2022 and are expected to take approximately six months to complete.
- 6.5.4 The land required for this utility diversion is outside the limits of the Bill and will result in a requirement for approximately 0.1ha of additional land. See Map CT-06-233, G3 to G1 in the SES2 and AP2 ES Volume 2, CA4 Map Book. It is assumed that all of the additional land will be returned to its existing use following construction.
- 6.5.5 The amendment is considered to require reassessment of the environmental effects and mitigation in the main ES as amended by SES1 and SES2, for the following topics: community, cultural heritage and sound, noise and vibration.

Community

- 6.5.6 The additional land for the permanent diversion of a Severn Trent Water water mains supply at the A525 Bar Hill Road was not included in the original scheme and therefore the main ES did not report any significant effects associated with it. This amendment has been assessed for potential noise effects to determine if these give rise to a new significant in-combination effect on community resources in this area. The assessment has concluded that this amendment will not give rise to any new likely residual significant effects.

Cultural heritage

- 6.5.7 The main ES reported a temporary minor adverse effect, which is not significant, on the Grade II listed 16th century town house, Madeley (WHMo44) and the Grade II listed Offley Almshouses (WHMo45), which are both designated assets of moderate value. Construction of the amendment will further affect the setting of these assets.

This will give rise to a new temporary medium adverse impact and a new temporary moderate adverse effect on these assets, which is significant.

- 6.5.8 For further information see the SES2 and AP2 ES Volume 5: Cultural heritage Map Book and the SES2 and AP2 ES Volume 5: Appendix CH-003-000.
- 6.5.9 The amendment in combination with the new permanent Severn Trent Water water mains supply to the Madeley tunnel south portal building (AP2-004-106) and the power supply to Madeley tunnel (AP2-004-007) will increase the impact on the setting of the Grade II listed 16th century town house, Madeley (WHMo44) and the Grade II listed Offley Almshouses (WHMo45).
- 6.5.10 No mitigation measures additional to those reported in the main ES and draft CoCP have been identified.
- 6.5.11 This will give rise to a new cumulative temporary significant effect, compared with the main ES. However, this will not change the overall significance of the effect on the assets as a result of the AP2 amendment.

Sound, noise and vibration

- 6.5.12 The main ES reported a likely significant construction airborne noise effect on the community at Bar Hill (ref.: CSVo4-Co2) at approximately 30 properties on Bar Hill Road for a duration of up to two years and six months.
- 6.5.13 As a result of the amendment, when considered in combination with the works identified in the main ES, a new construction noise impact is identified at an additional fourteen residential properties on Bar Hill Road (represented by assessment locations ref.: 14161, 14163 and 14165) for a duration of up to six months. This will result in a different significant effect for approximately 45⁶⁷ properties at Bar Hill for a duration of up to two years and six months.
- 6.5.14 No additional mitigation has been identified compared to that defined in the main ES and draft CoCP. For further information, see SES2 and AP2 ES Volume 5: Appendix SV-002-000.

6.6 Additional land for a new Severn Trent Water water mains supply to the Madeley tunnel south portal building (AP2-004-106)

- 6.6.1 The Bill provides for a new permanent Severn Trent Water water mains supply to the Madeley tunnel south portal building, 300m in length, from the A525 Bar Hill Road, along a proposed HS2 access track to the Madeley tunnel south portal building. See Map CT-06-233, F5 to D5 in the main ES Volume 2, CA4 Map Book.
- 6.6.2 Since submission of the Bill, further engagement with the utility provider has identified a need to change the alignment of the new water mains supply. The new water mains supply will be 1.6km in length, from 320m south of Station Road, running adjacent to Station Road and along the A525 Bar Hill Road, crossing the West Coast

⁶⁷ The sound, noise and vibration assessment rounds number of properties to the nearest five, e.g. 47 is rounded to 45, whereas the community assessment counts absolute numbers of properties.

Main Line (WCML) and continuing along the A525 Bar Hill and a HS2 access track to the Madeley tunnel south portal building. See Map CT-06-233, J2 to E5, and Map CT-06-233-R1, I10 to G10, in the SES2 and AP2 ES Volume 2, CA4 Map Book.

- 6.6.3 The activities will require the removal of any surface material from the area of the connection route (this may include vegetation, soil, and road surfacing), the removal of existing utility infrastructure (where necessary) and installation of the utility. As required and where suitable, topsoil will be temporarily stored adjacent to the working area and will be used to reinstate the area once the works are complete.
- 6.6.4 Activities to construct the utility are currently planned to be carried out in 2021-2022 and are expected to take approximately six months to complete.
- 6.6.5 The land required for this utility is outside the limits of the Bill and will result in a requirement for approximately 0.1ha of additional land. See Map CT-06-233, G2 to G3 in the SES2 and AP2 ES Volume 2, CA4 Map Book. It is assumed that all of the additional land will be returned to its existing use following construction.
- 6.6.6 This amendment is considered to require reassessment of the environmental effects and mitigation in the main ES as amended by SES1 and SES2, for cultural heritage.

Cultural heritage

- 6.6.7 The main ES reported a temporary minor adverse effect, which is not significant, on the Grade II listed 16th century town house, Madeley (WHM044) and the Grade II listed Offley Almshouses (WHM045), which are both designated assets of moderate value. Construction of the amendment will further affect the setting of these assets. This will give rise to a new temporary medium adverse impact and a new temporary moderate adverse effect on these assets, which is significant.
- 6.6.8 For further information see the SES2 and AP2 ES Volume 5: Cultural heritage Map Book and the SES2 and AP2 ES Volume 5: Appendix CH-003-000.
- 6.6.9 The amendment in combination with the new permanent diversion of a Severn Trent Water mains supply at the A525 Bar Hill Road (AP2-004-105) and the TBM power supply to Madeley tunnel (AP2-004-007) will increase the impact on the setting of the Grade II listed 16th century town house, Madeley (WHM044) and the Grade II listed Offley Almshouses (WHM045).
- 6.6.10 No mitigation measures additional to those reported in the main ES and draft CoCP have been identified.
- 6.6.11 This will give rise to a new cumulative temporary significant effect, compared to the main ES. However, this will not change the overall significance of the effect on the assets as a result of the AP2 amendment.

6.7 Additional land for the removal of an overhead Openreach telecommunications line near Moor Hall (AP2-004-107)

- 6.7.1 Since submission of the Bill, further engagement with the utility provider has identified a need for land to permanently remove an overhead Openreach telecommunications line near Moor Hall. The removal will be 680m in length, from

Barr Hill Cottage, parallel to the eastern side of the HS2 route, to Bower End Lane Map CT-06-233, F5 to C43, in the SES2 and AP2 ES Volume 2, CA4 Map Book.

- 6.7.2 The activities will require the removal of any surface material from the area of the route (this may include vegetation, soil, and road surfacing) and the removal of existing utility infrastructure. As required and where suitable, topsoil will be temporarily stored adjacent to the working area and will be used to reinstate the area once the works are complete.
- 6.7.3 Activities to remove the utility are currently planned to be carried out in 2021-2022 and are expected to take approximately six months to complete.
- 6.7.4 The land required for this utility is outside the limits of the Bill and will result in a requirement for approximately 890m² of additional land, some of which will be from Land at Moor Hall (CA4/7). See Map CT-05-233, D4 to C4 in the SES2 and AP2 ES Volume 2, CA4 Map Book. It is assumed that all of the additional land will be returned to its existing use following construction.
- 6.7.5 This amendment is considered to require reassessment of the environmental effects and mitigation in the main ES as amended by SES1 and SES2, for community.

Community

- 6.7.6 The land required for the amendment will be within the boundary of a residential property at Moor Hall Farm. The impact of the utility diversion at this property will be small in scale and of short duration (approximately three months), resulting in a temporary minor adverse effect, which is not significant. For further information see SES2 and AP2 ES Volume 5: Appendix CM-001-004.

6.8 Additional land for the underground diversion of Western Power Distribution 11kV and low voltage overhead lines near Bower End Farm (AP2-004-108)

- 6.8.1 The Bill provides for the permanent underground diversion of an 11kV overhead line, 120m in length, from Bower End Farm, crossing the proposed HS2 access track to the Madeley tunnel north portal building, to an existing Western Power Distribution pole 50m west of Bower End Farm. The Bill also provides for removal of a low voltage overhead line, 50m in length, 20m west of Bower End Farm. See Map CT-06-233, B4 to A4 and Map CT-06-234 J5 to I3 in the main ES Volume 2, CA4 Map Book.
- 6.8.2 Since submission of the Bill, further engagement with the utility provider has identified a need to change the alignment of the diversions. The underground 11kV diversion will be 170m in length, crossing the HS2 access track to the Madeley tunnel north portal building, to an existing Western Power Distribution pole 90m west of Bower End Farm. The underground low voltage diversion will be 140m in length, from a pole 20m north of Bower End Farm to a location west of Bower End Farm. See Map CT-06-233, A5 to A3, and CT-06-234, J5 to I3, in the SES2 and AP2 ES Volume 2, CA4 Map Book.
- 6.8.3 The activities will require the removal of any surface material from the area of the diversion route (this may include vegetation, soil, and road surfacing), the removal of existing utility infrastructure (where necessary) and installation of the utilities.

As required and where suitable, topsoil will be temporarily stored adjacent to the working area and will be used to reinstate the area once the works are complete.

- 6.8.4 Activities to divert the utilities are currently planned to be carried out in 2021-2022 and are expected to take approximately six months to complete.
- 6.8.5 The land required for this utility diversion is outside the limits of the Bill and will result in a requirement for approximately 0.2ha of additional land, some of which will be from Bower End Farm (CA4/18). See Map CT-06-233, A5 to A4 in the SES2 and AP2 ES Volume 2, CA4 Map Book. It is assumed that all of the land will be returned to its existing use following construction.
- 6.8.6 This amendment is considered to require reassessment of the environmental effects and mitigation in the main ES as amended by SES1 and SES2, for the following topics: community and landscape and visual.

Community

- 6.8.7 The land required for the amendment will be within the boundary of a residential property at Bower End Farm. The impact of the utility diversion at this property will be small in scale and of short duration (approximately three months), resulting in a minor adverse effect, which is not significant. For further information see SES2 and AP2 ES Volume 5: Appendix CM-001-004.

Landscape and visual

- 6.8.8 This amendment will involve construction activity which will be visible in views experienced by residents of Bower End Farm. The construction activity associated with the utility works will be small-scale and will take approximately six months to complete. The amendment will therefore not give rise to a new or different significant effect.

7 Combined effects of changes and amendments in the Whitmore Heath to Madeley area due to changes in construction traffic flows

7.1 Introduction

7.1.1 This section reports the combined assessment of new or different significant construction traffic effects, as a result of changes in construction traffic flows. These relate to changes associated with SES2 changes and AP2 amendments, where the change in traffic flows cannot be directly attributed to an SES2 change or an AP2 amendment.

7.1.2 The assessment has also considered any impacts in the Whitmore Heath to Madeley area associated with SES2 changes and AP2 amendments in the adjoining community areas.

7.1.3 Traffic and transport effects are reported first, since the effects arise from changes in construction traffic flows. Other topics where a significant effect has been identified, are then reported in the following sequence:

- air quality;
- sound, noise and vibration;
- community; and
- socio-economics.

7.2 SES2 changes and AP2 amendments of relevance to this assessment

7.2.1 The assessment includes all changes to construction traffic. The primary contributors to construction traffic are the changes to the movement of excavated material, construction programme and construction assumptions. The assessment takes into account measures to reduce the need to move material by the road network and use of site haul routes to limit construction traffic on the road network.

7.2.2 Of the design changes and amendments, the following make a particular contribution to the assessment of changes in traffic flows in the Whitmore Heath to Madeley area:

- Additional land required and a change to Bill powers for modifications to the A51 Stone Road/Nantwich Road/A53 Newcastle Road junction (AP2-004-003);
- Additional land required and changes to Bill powers for changes to the vertical and horizontal alignment between Hatton South cutting and Madeley Bridleway 1 accommodation green overbridge (AP2-004-002);
- Increase in average mineral excavation depth for the borrow pit west of Netherset Hey Farm (SES2-004-002); and

- Local placement of surplus excavated material to the north of Whitmore South cutting (SES2-004-001).

7.3 Traffic and transport

Scope, assumptions and limitations

- 7.3.1 The assessment scope, key assumptions and limitations for traffic and transport are as set out in Volume 1, the Scope and Methodology Report⁶⁸ (SMR) and SMR Addendum⁶⁹ of the main ES.

Environmental baseline

Existing baseline

- 7.3.2 The baseline traffic and transport information for the Whitmore Heath to Madeley area is generally as described in Volume 2, CA4, Section 14 of the main ES.
- 7.3.3 The M6 is the only strategic road that runs through the Whitmore Heath to Madeley area. The M6 runs in a north-west/south-east alignment along the eastern boundary of the area. Junction 15 of the M6 is located on the south-east boundary of the area.
- 7.3.4 There are four primary 'A' roads in the Whitmore Heath to Madeley area, these are: the A51 London Road, which traverses the western boundary of the area; the A53 Newcastle Road/Whitmore Road, which passes through Baldwin's Gate and Whitmore; the A525 Bar Hill Road/Newcastle Road, which passes through the settlements of Onneley, Madeley and Madeley Heath; and the A5182 Trentham Road, which connects the A53 Newcastle Road/Whitmore Road to the A519 Newcastle Road located in the adjacent Stone and Swynnerton area (CA3). The strategic and primary road network can get busy at peak times and delays can be experienced.
- 7.3.5 The main local roads that are of relevance to the assessment are: Bent Lane, which connects the settlements of Whitmore and Stableford; Common Lane, Heath Road and Snape Hall Road, which provide access around Whitmore Heath; Manor Road, which serves Baldwin's Gate and connects to Madeley; and Bower End Lane, which connects a number of rural properties to the settlement of Madeley. The local road network in this area generally operates well, although some localised delays can be experienced, particularly at peak times.
- 7.3.6 There are pedestrian footways adjacent to many of the roads in the built up areas of Baldwin's Gate, Madeley and Woore. Footways vary in width and condition within these areas. Where there is no formal footway provision adjacent to a road, non-motorised user numbers are generally low.

⁶⁸ HS2 Ltd (2017). *High Speed Rail (West Midlands - Crewe) Environmental Statement*, Volume 5: Technical appendices, Environmental Impact Assessment Scope and Methodology Report (Appendix CT-001-001). Available online at: <https://www.gov.uk/government/publications/scope-and-methodology-report-for-hs2-phase-2a>

⁶⁹ HS2 Ltd (2017). *High Speed Rail (West Midlands - Crewe) Environmental Statement*, Volume 5: Technical appendices, Environmental Impact Assessment Scope and Methodology Report Addendum (Appendix CT-001-002). Available online at: <https://www.gov.uk/government/publications/scope-and-methodology-report-for-hs2-phase-2a>

- 7.3.7 In the Whitmore Heath to Madeley area, there are few off-road cycle routes serving the settlements. There are a number of advisory cycle routes passing through areas of Loggerheads, Ashley, Stableford, Baldwin's Gate, Madeley and Madeley Heath.

Future baseline

Construction (2023)

- 7.3.8 The future baseline for construction in 2023 remains unchanged from that reported in the main ES Volume 5: Appendix CT-004-000.

Effects arising during construction

Avoidance and mitigation measures

- 7.3.9 No avoidance or mitigation measures additional to those reported in the main ES and draft Code of Construction Practice (CoCP)⁷⁰ have been identified.

Assessment of impacts and effects

Temporary effects

Construction compounds

- 7.3.10 Volume 2, CA4, Section 14 of the main ES provides details of construction compounds in the Whitmore Heath to Madeley area. This information has been updated to reflect the provision of new compounds and changes to existing compounds resulting from the SES2 changes and AP2 amendments. This information is provided in Table 8.

⁷⁰ HS2 Ltd (2017). *High Speed Rail (West Midlands - Crewe) Environmental Statement*, Volume 5: Technical appendices, draft Code of Construction Practice (CT-003-000). Available online at <https://www.gov.uk/government/publications/draft-code-of-construction-practice-for-hs2-phase-2a>

SES2 and AP2 ES Volume 2 – Community area 4, Whitmore Heath to Madeley

Table 8: Typical vehicle trip generation for construction sites in the Whitmore Heath to Madeley area

| Compound type | Location | Access to/from compound to main road network | Indicative start/set up date | Estimated duration of use (years) ⁷¹ | Estimated duration of busy period (months) | Average daily combined two-way vehicle trips during busy period and within peak month of activity ⁷² | |
|---------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|-------------------------------------------------|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------|---------|
| | | | | | | Cars/LGV | HGV |
| Satellite | Stableford North embankment satellite compound | Bent Lane (North) to A51 The Rowe for site set-up and servicing, followed by site haul route and after that to the A53 Newcastle Road | Civil engineering - October 2020 Site reinstatement - January 2026 | Four years and three months Nine months | 10 | 66-66 | 48-74 |
| | | | | | 2 | | 43-56 |
| Satellite | Whitmore Heath tunnel satellite compound | A53 Newcastle Road | Civil engineering - October 2020 Site reinstatement – January 2026 | Four years and three months Three months | 12 | 217-220 | 63-97 |
| | | | | | 2 | | 52-52 |
| Satellite | A53/A51 off route highway modifications compound | A53 Newcastle Road | July 2020 | Six months | 5 | 22-23 | 11-17 |
| Satellite | Whitmore Heath tunnel south portal satellite compound | A53 Newcastle Road | December 2024 | One year | 5 | 49-65 | 110-152 |
| Transfer node | Transfer node associated with Whitmore Heath tunnel satellite compound | A53 Newcastle Road | October 2021 | Three years and three months | 14 | N/A | 382-550 |
| Satellite | Whitmore Heath tunnel north portal satellite compound | Snape Hall Road/site haul route to A53 Newcastle Road | January 2025 | One year and six months | 2 | 34-44 | 11-11 |

⁷¹ The Volume 2 scheme description of the construction phase represents the duration of works in a different way to the Volume 5 Transport Assessment addendum (SES2 and AP2 ES Volume 5: Appendix Tr-001-000). The Volume 2 scheme description is based on quarters (each representing three months), e.g. December (Quarter 4) to February (Quarter 1) is rounded to six months, whereas the Volume 5 Transport Assessment addendum counts the absolute duration and is then rounded e.g. three months.

⁷² For each compound the peak month of activity is the month within which HGV traffic is at its highest for that compound. The busy period is the period during which HGV traffic serving that compound will be greater than 50% of the HGV traffic in the peak month. The average daily combined two-way vehicle trips for the busy period is the lower end of the range shown in the table below. Two-way trips refer to the total number of vehicle movements in both directions (i.e. with 200 westbound vehicles and 100 eastbound vehicles, there would be 300 two-way trips).

SES2 and AP2 ES Volume 2 – Community area 4, Whitmore Heath to Madeley

| Compound type | Location | Access to/from compound to main road network | Indicative start/set up date | Estimated duration of use (years) ⁷¹ | Estimated duration of busy period (months) | Average daily combined two-way vehicle trips during busy period and within peak month of activity ⁷² | |
|---------------|------------------------------------------------------------------|-------------------------------------------------------|-----------------------------------|-------------------------------------------------|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------|----------|
| | | | | | | Cars/LGV | HGV |
| Satellite | Whitmore North cutting satellite compound | A53 Newcastle Road | Civil engineering - October 2020 | Three years and six months | 6 | 77-77 | 60-96 |
| | | | Site reinstatement – January 2026 | Three months | 2 | | 46-48 |
| Satellite | Whitmore north auto-transformer station satellite compound | Snape Hall Road/site haul route to A53 Newcastle Road | August 2024 | One year and three months | 7 | 32-44 | up to 10 |
| Satellite | River Lea viaduct satellite compound | Manor Road to A525 Bar Hill Road | Civil engineering - October 2020 | Four years and six months | 33 | 110-110 | 50-70 |
| | | | Site reinstatement – March 2026 | Six months | 4 | | 61-61 |
| Satellite | Madeley cutting satellite compound | A525 Bar Hill Road | Civil engineering - October 2020 | Four years and six months | 19 | 33-33 | 25-40 |
| | | | Site reinstatement – May 2026 | Three months | 1 | | 18-18 |
| Transfer node | Transfer node associated with Madeley cutting satellite compound | A525 Bar Hill Road | October 2021 | Three years and three months | 9 | N/A | 125-171 |
| Satellite | Madeley tunnel (south) satellite compound | A525 Bar Hill Road | Civil engineering - April 2020 | Four years and nine months | 16 | 228-231 | 45-58 |
| | | | Site reinstatement – May 2026 | Three months | 1 | | 42-42 |
| | | | Railway systems – December 2024 | Nine months | 2 | | 33-40 |
| Satellite | Madeley tunnel (north) satellite compound | A525 Bar Hill Road | April 2020 | Four years and nine months | 6 | 33-33 | 32-34 |

| Compound type | Location | Access to/from compound to main road network | Indicative start/set up date | Estimated duration of use (years) ⁷¹ | Estimated duration of busy period (months) | Average daily combined two-way vehicle trips during busy period and within peak month of activity ⁷² | |
|---------------|------------------------------------------------|------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|-------------------------------------------------|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------|-------|
| | | | | | | Cars/LGV | HGV |
| Satellite | Madeley tunnel north portal satellite compound | A525 Bar Hill Road | August 2024 | Two years | 2 | 53-78 | 90-98 |
| Satellite | Checkley South embankment satellite compound | A525 Bar Hill for site set up and serving, followed by site haul route to the A500 Shavington Bypass | Civil engineering - October 2020 Site reinstatement – June 2026 | Four years and six months | 5 | 77-77 | 29-45 |
| | | | | Three months | 1 | | 38-38 |

7.3.11 Information on the indicative construction programme is provided in Section 2 of the SES2 and the construction methodology is summarised in Volume 1, Section 6 of the main ES. This illustrates how the phasing of activities at different compounds will generally be staggered and that construction activities at individual compounds may not occur over the whole duration presented in Table 8.

7.3.12 Where construction routes serve more than one construction compound, the combined vehicle movements during the busiest period for each section of each route have been assessed. The effects resulting from changes to construction compounds have been considered and are reported in the highway network section.

Highway network

7.3.13 The main ES considered the traffic and transport effects in the area during construction. In particular, the effects associated with the combined construction traffic flows into and through the area were identified. The main ES reported that changes in peak hour traffic flows would lead to delays to vehicle users and congestion at the A51 Nantwich Road/A53 Newcastle Road staggered crossroads junction. This was reported in the main ES as a major adverse significant effect.

7.3.14 The AP2 revised scheme includes an amendment to modify the A51 Nantwich Road/A53 Newcastle Road staggered crossroads junction (AP2-004-003). This amendment, combined with reduced construction traffic flows through the junction as a consequence of changes in the movement and use of surplus excavated material, including through the increased extraction from the borrow pit west of Netherset Hey Farm (SES2-004-002), will remove the major adverse significant effect on congestion and delay to vehicle users of the A51 London Road/A53 Newcastle Road staggered crossroads junction, as reported in the main ES.

7.3.15 There are other changes to traffic congestion and delay arising from the combination of SES2 changes and AP2 amendments, however these do not result in new or different significant traffic effects. Changes to traffic are reported in SES2 and AP2 ES Volume 5: Appendix TR-001-000.

- 7.3.16 The main ES reported traffic severance effects for non-motorised users from increases in either all traffic (including worker trips, light goods vehicle (LGV) and heavy goods vehicle (HGV) traffic) or HGV traffic, which were significant at the following locations:
- A51 London Road between Dog Lane and Checkley Lane – major adverse effect as a result of an increase in all traffic;
 - A53 Newcastle Road between the A51 London Road and the A5182 Trentham Road – major adverse effect as a result of an increase in all traffic;
 - A525 Bar Hill Road between the A51 London Road and the HS2 route – major adverse effect as a result of an increase in all traffic;
 - A525 Bar Hill Road between the HS2 route and Manor Road – minor adverse effect as a result of an increase in HGV traffic;
 - Manor Road between the HS2 route and the A525 Bar Hill Road – moderate adverse effect as a result of an increase in all traffic; and
 - Snape Hall Road between Common Lane and the HS2 route – moderate adverse effect as a result of an increase in all traffic.
- 7.3.17 Reduced construction traffic flows, as a consequence of reductions in the movement and use of surplus excavated material, including through the increased extraction from the borrow pit west of Netherset Hey Farm (SES2-004-002), will result in changes to the traffic severance effects for non-motorised users, as reported in the main ES, at the following locations:
- A51 London Road between Dog Lane and Checkley Lane – a reduction in construction traffic flows on the A51 London Road will remove the temporary major adverse significant effect between Dog Lane and the A53 Newcastle Road. The level of significance of the effect on the A51 London Road between the A53 Newcastle Road and Checkley Lane will reduce from a temporary major adverse significant effect to a temporary moderate adverse effect, which is significant;
 - A53 Newcastle Road between the A51 London Road and the A5182 Trentham Road – a reduction in construction traffic flows on this section will reduce the level of significance of the effect between the HS2 route and the A51 London Road from a temporary major adverse significant effect to a temporary minor adverse effect, which is significant. The amendments will not change the level of significance between the HS2 route and the A5182 Trentham Road; and
 - A525 Bar Hill Road between the A51 London Road and the HS2 route – a reduction in construction traffic flows on this section will reduce the level of significance of the effect between the A51 London Road and the HS2 route from a temporary major adverse significant effect to a temporary moderate adverse effect, which is significant.
- 7.3.18 There are other changes to construction traffic flows arising from the combination of SES2 changes and AP2 amendments, however these do not result in new or different significant traffic effects. Changes to traffic are reported in SES2 and AP2 ES Volume 5: Appendix TR-001-000.

Permanent effects

- 7.3.19 There are no permanent traffic and transport effects resulting from changes in construction traffic flows in the Whitmore Heath to Madeley area.

Other mitigation measures

- 7.3.20 No mitigation measures additional to those reported in the main ES and draft CoCP are required.

Summary of likely residual significant effects

- 7.3.21 The SES2 changes and AP2 amendments will remove the major adverse significant effect on congestion and delay, as reported in the main ES, to vehicle users of the A51 London Road/A53 Newcastle Road staggered crossroads junction.
- 7.3.22 The SES2 changes and AP2 amendments will result in the following changes to the traffic severance effects for non-motorised users, as reported in the main ES, at the following locations:
- A51 London Road between Dog Lane and the A53 Newcastle Road – will remove the major adverse significant effect;
 - A51 London Road between the A53 Newcastle Road and Checkley Lane – will reduce from a temporary major adverse significant effect to a likely temporary moderate adverse significant effect;
 - A53 Newcastle Road between the HS2 route and the A51 London Road – will reduce from a temporary major adverse significant effect to a likely temporary minor adverse significant effect; and
 - A525 Bar Hill Road between the A51 London Road and the HS2 route – will reduce from a temporary major adverse significant effect to a likely temporary moderate adverse significant effect.

Cumulative effects

- 7.3.23 This combined assessment has taken into account cumulative effects from background traffic growth, committed developments and traffic and transport impacts arising from the SES2 changes and AP2 amendments in this area and other community areas.

7.4 Air quality

Scope, assumptions and limitations

- 7.4.1 The assessment scope, key assumptions and limitations for air quality are as set out in Volume 1 and the SMR and SMR Addendum⁷³ of the main ES.

⁷³ HS2 Ltd (2017). *High Speed Rail (West Midlands - Crewe) Environmental Statement*, Volume 5: Technical appendices, Environmental Impact Assessment Scope and Methodology Report Addendum (Appendix CT-001-002). Available online at: <https://www.gov.uk/government/publications/scope-and-methodology-report-for-hs2-phase-2a>

- 7.4.2 As set out in Volume 1, since the production of the main ES, updated background pollutant concentrations and road vehicle emission factors have become available from the Department for Environment, Food and Rural Affairs (Defra). These have been used in this assessment. The updated road vehicle emission factors are higher for NO_x than those used in the main ES, especially along motorways. Therefore, higher concentrations have been predicted for the future baseline scenario (without the HS2 scheme). At locations where NO₂ concentrations are predicted to exceed the annual mean air quality standard of 40µg/m³ without the scheme, it is more likely that a small increase in concentrations due to the scheme will result in a significant effect.

Environmental baseline

Existing baseline

- 7.4.3 The existing baseline for air quality is as described in Volume 2, CA4, Section 5 of the main ES.
- 7.4.4 Since the production of the main ES, air quality measurements for the baseline year of 2016 have become available. There are currently three relevant diffusion tube sites located within the Whitmore Heath to Madeley area for monitoring NO₂ concentrations. Measured annual mean concentrations at these sites in 2016 are within the air quality standard. Details of their location and data measurements are provided in the SES2 and AP2 ES Volume 5: Appendix AQ-001-004 and Map Series AQ-01.
- 7.4.5 The updated background concentrations from Defra are within the air quality standards for all pollutants in the baseline year of 2016 within the Whitmore Heath to Madeley area. Details are provided in Background Information and Data (BID) documents (BID-AQ-002-000), which accompany the SES2 and AP2 ES.

Future baseline

Construction (2020)

- 7.4.6 The updated background concentrations from Defra for the first year of construction in 2020 predict NO₂, PM₁₀ and PM_{2.5} levels in 2020 to be lower than in the 2016 baseline and within the relevant air quality standards.
- 7.4.7 Volume 5: Appendix CT-004-000 of the SES2 and AP2 ES provides details of the developments which are assumed to have been implemented by 2020 for construction, additional to those identified in the main ES. These have been included as future receptors in the assessment of air quality impacts and are detailed in Volume 5: Appendix AQ-001-004.
- 7.4.8 None of the identified developments affect the assessment of the SES2 scheme and AP2 revised scheme's likely construction and operation impacts on air quality.

Effects arising during construction

Avoidance and mitigation measures

- 7.4.9 No avoidance or mitigation measures additional to those reported in the main ES and draft CoCP are required.

Assessment of impacts and effects

Temporary effects

- 7.4.10 Construction activity could affect local air quality through the additional traffic generated on local roads as a result of construction vehicles and through changes to traffic patterns arising from temporary road diversions and realignments.
- 7.4.11 The assessment of construction traffic emissions has been undertaken for a 'without scheme' scenario and a 'with scheme' scenario. The traffic data for each scenario includes the additional traffic from future committed developments.
- 7.4.12 Construction traffic data in the area has been screened to identify roads that required further assessment and to confirm the likely effect of the change in emissions from vehicles using those roads in the construction period. These were primarily the main roads within the Whitmore Heath to Madeley area, including the M6, the A51 London Road junction with the A53 Newcastle Road, and the A5182 Trentham Road.
- 7.4.13 Concentrations of NO₂ are predicted to exceed the air quality standard at one receptor close to the M6 in Madeley. NO₂ concentrations in this area are predicted to exceed the air quality standard even without the scheme. A new significant effect is predicted at one receptor for NO₂ concentrations, close to the M6 in Madeley. This is due to a combination of changes in the predicted emissions for the revised future baseline and an increase in construction traffic in this area. However, more than 95% of the increase is a result of the revised future baseline compared to the increase in construction traffic. No new or different significant effects are predicted at other receptors for NO₂ concentrations in the Whitmore Heath to Madeley area.
- 7.4.14 Concentrations of PM₁₀ and PM_{2.5} are predicted to be within the relevant air quality standards during construction of the AP2 revised scheme. No new or different significant effects are predicted at any receptor for PM₁₀ and PM_{2.5} concentrations during construction of the AP2 revised scheme. Details are provided in the SES2 and AP2 ES Volume 5: Appendix AQ-001-004.

Permanent effects

- 7.4.15 No permanent effects on local air quality are likely to arise from changes in construction traffic flows in the Whitmore Heath to Madeley area.

Other mitigation measures

- 7.4.16 No mitigation measures additional to those reported in the main ES and draft CoCP are required.

Summary of likely residual significant effects

- 7.4.17 There will be a new likely residual significant effect at one residential receptor close to the M6 in Madeley, in relation to exceedances of NO₂ concentrations. This is due to a combination of changes in the predicted emissions for the revised future baseline and an increase in construction traffic in this area. No residual significant effects are anticipated at other locations in the Whitmore Heath to Madeley area.

Cumulative effects

- 7.4.18 This combined assessment has taken into account cumulative effects from background traffic growth, committed developments and impacts related to traffic emissions arising from the SES2 changes and AP2 amendments in this area and other community areas.

7.5 Sound, noise and vibration

Scope, assumptions and limitations

- 7.5.1 The assessment scope, key assumptions and limitations for sound, noise and vibration are as set out in Volume 1 and the SMR of the main ES.

Environmental baseline

Existing baseline

- 7.5.2 The baseline sound, noise and vibration information for the Whitmore Heath to Madeley area is as described in Volume 2, CA4, Section 13 of the main ES.

Future baseline

Construction (2020)

- 7.5.3 The future baseline for construction in 2020 remains unchanged from that reported in the main ES Volume 5: Appendix CT-004-000.

Effects arising during construction

Avoidance and mitigation measures

- 7.5.4 No avoidance or mitigation measures, additional to those reported in the main ES and draft CoCP, have been identified.

Assessment of impacts and effects

- 7.5.5 The main ES identified an indirect likely construction significant effect on a community basis at:
- approximately 10 residential properties on or adjacent to Bent Lane between the HS2 route and Whitmore Road, Whitmore. This was denoted as CSV04-Co3 in the main ES Volume 5: Appendix SV-002-004;
 - approximately 25 residential properties on or adjacent to Snape Hall Road, Whitmore Heath between the northern portal of the Whitmore Heath tunnel and the A53 Whitmore Road. This was denoted as CSV04-Co1 and CSV04-Co4 in the main ES Volume 5: Appendix SV-002-004. A combined construction site and traffic likely significant noise effect was denoted at the properties identified as CSV04-Co1; and
 - approximately 40 residential properties on or adjacent to the A525 Bar Hill Road, Madeley between the HS2 route and Manor Road, Madeley. This was denoted as CSV04-Co2 in the main ES Volume 5: Appendix SV-002-004.

A combined construction site and traffic likely significant noise effect was identified at these properties.

- 7.5.6 The change in construction road traffic reduces both the average and peak monthly construction road traffic flows on Bent Lane, Snape Hall Road and the A525 Bar Hill Road, and thus reduces the associated construction traffic noise levels. For further information, see SES2 and AP2 ES Volume 5: Appendix SV-002-000. The reduction in construction traffic noise levels will remove the indirect significant effect reported in the main ES as amended by SES1, on properties on Bent Lane, Snape Hall Road and the A525 Bar Hill Road.
- 7.5.7 At the properties on Snape Hall Road, Whitmore and the A525 Bar Hill Road, Madeley where the main ES identified a combined likely significant effect (due to noise from construction activities and noise from construction traffic movements), only the construction traffic noise effect is removed. Significant effects at those properties from the construction activities remains as reported in the main ES, as amended by SES2, denoted as CSV04-Co1 and CSV04-Co2 in the main ES Volume 5: Appendix SV-002-004.

Other mitigation measures

- 7.5.8 No mitigation measures additional to those reported in the main ES and draft CoCP are required.

Summary of likely residual significant effects

- 7.5.9 The construction traffic changes will remove the likely residual significant indirect effect reported in the main ES as amended by SES1, on properties adjacent to Bent Lane, Snape Hall Road and the A525 Bar Hill Road.

Cumulative effects

- 7.5.10 This combined assessment has taken into account cumulative effects from changes in traffic flows as a result of the all SES2 changes and AP2 amendments in this area and other community areas.

7.6 Community

Scope, assumptions and limitations

- 7.6.1 The assessment scope, key assumptions and limitations for community are as set out in Volume 1 and the SMR and SMR Addendum⁷⁴ of the main ES.

Environmental baseline

Existing baseline

- 7.6.2 The baseline community information for the Whitmore Heath to Madeley area is as described in Volume 2, CA1, Section 6 of the main ES.

⁷⁴ HS2 Ltd (2017). *High Speed Rail (West Midlands - Crewe) Environmental Statement*, Volume 5: Technical appendices, Environmental Impact Assessment Scope and Methodology Report Addendum (Appendix CT-001-002). Available online at: <https://www.gov.uk/government/publications/scope-and-methodology-report-for-hs2-phase-2a>

- 7.6.3 To the south of Madeley, along Manor Road, between the Stoke to Market Drayton Railway and the A525 Bar Hill Road, there are a number of sparsely located residential properties.
- 7.6.4 Whitmore is a village located off the A53 Whitmore Road with approximately 38 residential properties. The village provides a small number of community facilities, including a church and village hall. Whitmore Heath is an adjacent community to the west with approximately 56 residential properties.
- 7.6.5 Madeley Park Wood is a village located along Manor Road to the west of Whitmore Wood, with approximately 145 residential properties. Further north along Manor Road, between the Stoke to Market Drayton Railway and the A525 Bar Hill Road, there are a number of sparsely located residential properties.
- 7.6.6 Madeley is a village located along the A525 Bar Hill Road with approximately 1,595 residential properties. The village provides a number of community facilities, including three schools, a church, a community centre, post office and a number of convenience stores.

Future baseline

Construction (2020)

- 7.6.7 The future baseline for construction in 2020 remains unchanged from that reported in the main ES Volume 5: Appendix CT-004-000.

Effects arising during construction

Avoidance and mitigation measures

- 7.6.8 No avoidance or mitigation measures additional to those reported in the main ES and draft CoCP are required.

Assessment of impacts and effects

Temporary effects

- 7.6.9 The main ES reported that approximately 20 properties on Manor Road would experience significant temporary adverse visual effects due to construction works. The main ES further reported that all of these properties would experience a significant noise effect and one of the properties would experience a significant temporary increase in heavy good vehicles (HGVs). The in-combination effect would result in a temporary major adverse significant effect at the 20 properties.
- 7.6.10 The changes to construction traffic flows will result in reduced traffic volumes on Manor Road, therefore removing the significant noise effect on all the properties. This will remove the in-combination significant effect on these properties reported in the main ES. For further information see SES2 and AP2 ES Volume 5: Community Map Book.
- 7.6.11 The main ES, as amended by SES1, reported that approximately 25 properties in Whitmore and Whitmore Heath would experience significant temporary adverse visual effects due to construction works. The main ES, as amended by SES1, further reported that all of these properties would experience a significant temporary adverse

noise effect. The in-combination effect would result in a temporary major adverse significant effect at the 25 properties.

- 7.6.12 Changes to construction traffic flows will result in a reduction in the number of properties in Whitmore and Whitmore Heath which will be subject to a significant noise effect, from 25 properties to 11 properties. This will decrease the overall in-combination effect reported in the main ES as amended by SES1, from 25 properties to 11 properties. This will give rise to a different in-combination effect, however this will not change the level of significance of the effect reported in the main ES, as amended by SES1.
- 7.6.13 The main ES, as amended by SES1, reported that approximately 43 properties on the A525 Bar Hill Road and Mallard Close would experience significant temporary adverse visual effects due to views of construction works. The main ES, as amended by SES1, further reported that all of these properties would experience a significant noise effect and a significant HGV effect. The in-combination effect would result in a temporary major adverse significant effect at the 43 properties.
- 7.6.14 Changes to construction traffic flows will result in a reduction in the number of properties on the A525 Bar Hill Road and Mallard Close which will be subject to a significant noise effect, from 43 properties to 37 properties. This will decrease the overall in-combination effect reported in the main ES, as amended by SES1, from 43 properties to 37 properties. This will give rise to a different in-combination effect, however this will not change the level of significance of the effect reported in the main ES, as amended by SES1.
- 7.6.15 For further information see SES2 and AP2 ES Volume 5: Appendix CM-001-004 and SES2 and AP2 ES Volume 5: Community Map Book.

Permanent effects

- 7.6.16 The changes in traffic flows will not give rise to a new or different significant permanent effect and will not change the level of significance of the permanent effects, as reported in the main ES.

Other mitigation measures

- 7.6.17 No mitigation measures additional to those reported in the main ES and draft CoCP are required.

Summary of likely residual significant effects

- 7.6.18 The changes to traffic flows will remove a likely residual significant in-combination effect on 20 properties on Manor Road due to the removal of significant noise effects on all the properties.
- 7.6.19 The changes to construction traffic flows will give rise to a different likely residual significant temporary adverse effect, due to a decrease in the number of properties in Whitmore and Whitmore Heath subject to an in-combination effect from significant noise and visual effects. However, this will not change the level of significance of the effects reported in the main ES.
- 7.6.20 The changes to construction traffic flows will give rise to a different likely residual significant temporary adverse effect, due to a decrease in the number of properties on

the A525 Bar Hill Road and Mallard Close subject to an in-combination effect from significant noise, HGV and visual effects. However, this will not change the level of significance of the effects reported in the main ES.

Cumulative effects

- 7.6.21 This combined assessment has taken into account cumulative effects from changes in traffic flows as a result of the all SES2 changes and AP2 amendments in this area and other community areas.

7.7 Socio-economics

Scope, assumptions and limitations

- 7.7.1 The assessment scope, key assumptions and limitations for socio-economics are as set out in Volume 1 and the SMR of the main ES.

Environmental baseline

Existing baseline

- 7.7.2 The existing baseline for socio-economics is as described in Volume 2, CA4, Section 12 of the main ES.

Future baseline

Construction (2020)

- 7.7.3 The future baseline for construction in 2020 remains unchanged from that reported in the main ES Volume 5: Appendix CT-004-000.

Effects arising during construction

Avoidance and mitigation measures

- 7.7.4 No avoidance or mitigation measures additional to those reported in the main ES and draft CoCP are required.

Assessment of impacts and effects

Temporary effects

- 7.7.5 Construction activity could affect businesses as a result of the environmental effects associated with the additional traffic generated on local roads by construction vehicles and changes to traffic patterns arising from temporary road diversions and realignments. These environmental effects include road congestion, increased noise and air pollution.
- 7.7.6 A combination of these effects on businesses may lead users to divert trade to other locations which do not experience these effects. Only certain types of businesses will be particularly sensitive to their surroundings and these will be drawn from sectors like hospitality, catering, recreational/cultural and retail (depending on circumstances).
- 7.7.7 Businesses identified as sensitive to environmental effects with two or more significant adverse effects drawn from other environmental topics are considered to

be affected by in-combination effects, as set out in the SMR and SMR Addendum of the main ES.

- 7.7.8 Based on a review of the environmental effects, no new or different significant in-combination effects are predicted at any business receptors as a result of the changes to construction traffic flows.

Permanent effects

- 7.7.9 The changes in traffic flows will not give rise to a new or different significant permanent effect and will not change the level of significance of the permanent effects, as reported in the main ES.

Other mitigation measures

- 7.7.10 No mitigation measures additional to those reported in the main ES and draft CoCP are required.

Summary of likely residual significant effects

- 7.7.11 No new or different significant effects are likely in the Whitmore Heath to Madeley area as a result of changes to construction traffic flows from the SES2 design changes and AP2 amendments.

Cumulative effects

- 7.7.12 This combined assessment has taken into account cumulative effects from changes in traffic flows as a result of the all SES2 changes and AP2 amendments in this area and other community areas.

7.8 Summary of new or different likely residual significant effects as a result of combined effects due to changes in traffic flows

- 7.8.1 The SES2 changes and AP2 amendments will remove the likely residual significant effect on congestion and delay to vehicle users of the A51 London Road/A53 Newcastle Road staggered crossroads. The SES2 changes and AP2 amendments will also remove the likely residual significant severance effect on non-motorised users of the A51 London Road, between Dog Lane and the A53 Newcastle Road. The likely residual significant severance effect on non-motorised users at the following locations will be reduced: the A51 London Road between the A53 Newcastle Road and Checkley Lane; the A53 Newcastle Road between the HS2 route and the A51 London Road; and the A525 Bar Hill Road between the A51 London Road and the HS2 route.
- 7.8.2 A combination of changes in the predicted emissions for the revised future baseline and an increase in construction traffic in this area will give rise to a new likely residual effect on air quality at one residential receptor close to the M6 in Madeley. This is in relation to exceedances of NO₂ concentrations.
- 7.8.3 The changes in construction traffic flows arising from the SES2 changes and AP2 amendments will reduce the associated construction traffic noise levels on properties adjacent to Bent Lane, Snape Hall Road and the A525 Bar Hill Road, removing the likely residual indirect significant effects.

- 7.8.4 The changes in construction traffic flows will remove a likely residual significant in-combination effect on 20 properties on Manor Road due to the removal of significant noise effects on all the properties. In addition, the number of properties in Whitmore and Whitmore Heath and on the A525 Bar Hill Road and Mallard Close subject to a likely residual temporary in-combination effect will be reduced. However, this will not change the level of significance of the effects reported in the main ES.

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