

HIGH SPEED RAIL (LONDON - WEST MIDLANDS)

Supplementary Environmental Statement 3 and
Additional Provision 4 Environmental Statement

Volume 2 | Community forum area reports

CFA11 Stoke Mandeville and Aylesbury

October 2015

SES3 and AP4 ES 3.2.1.11



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Department for Transport

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

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

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

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- Volume 5: Appendices and Map Books. This contains environmental information and associated maps in support of the other volumes of the SES₃ and AP₄ ES.
- Glossary of terms and list of abbreviations. This contains any new or different terms and abbreviations used throughout the SES and AP ES reports, additional to those included in the main ES.

Structure of this report

This volume of the SES₃ and AP₄ ES is divided into CFA reports, which are in turn divided into two parts.

Part 1 provides supplementary environmental information relating to:

- new baseline information with respect to traffic and transport surveys; and
- changes to the design or construction assumptions which do not require changes to the Bill.

Part 1 of each CFA report includes, where relevant:

- a description of the changes or updates within the CFA that have triggered the need for reassessment;
- an assessment of the environmental effects of the changes for relevant environmental topics considering the:
 - scope, assumptions and limitations of the SES₃ assessment;
 - changes of relevance to the assessment;
 - environmental baseline;
 - effects arising during construction;
 - effects arising from operation; and
 - mitigation and residual effects
- a summary of any new or different likely residual significant effects as a result of the changes.

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. The following is included where relevant:

- a summary of the proposed amendments within each CFA that have triggered the need for reassessment;
- a description of each amendment;
- an assessment of the environmental effects of each amendment for relevant environmental topics considering the:
 - scope, assumptions and limitations of the AP₄ ES assessment;
 - environmental baseline;
 - effects arising during construction;
 - effects arising from operation; and
 - mitigation and residual effects

- a summary of any new or different likely residual significant effects as a result of each proposed amendment.

1 Introduction

- 1.1.1 The Bill for High Speed Rail between London and the West Midlands was submitted to Parliament together with the main ES in November 2013. The AP1 ES, which was submitted in September 2014, contained generally minor amendments to the design of the original scheme (i.e. the scheme submitted in November 2013) in CFAs 7 - 26. The SES and AP2 ES which was submitted in July 2015, updated the main ES and contained a number of further amendments to the design of the original scheme in CFAs 4 - 26. The SES2 and AP3 ES which was submitted in September 2015, contained further updates to the main ES and reported the assessment of a number of amendments to the design of the original scheme in CFAs 1 - 5.
- 1.1.2 Since the submission of the main ES and subsequent SES and AP documents, updates to environmental baseline information and changes to 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 SES3 (Part 1) or AP4 ES (Part 2) of this document.
- 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 One 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 CFAs
the original scheme	the Bill scheme submitted to Parliament in November 2013, which was assessed in the main ES	1 - 26
the AP1 revised scheme	the original scheme as amended by the AP submitted in September 2014	7 - 26
the SES scheme	the original scheme with the design changes described in the SES submitted in July 2015	4 - 26
the AP2 revised scheme	the SES scheme as amended by the AP2 submitted in July 2015	4 - 26
the SES2 scheme	the original scheme as updated by the SES scheme, with the design changes described in the SES2 submitted in September 2015	1 – 5 (i.e. this applies in the London area only)
the AP3 revised scheme	the SES2 scheme as amended by the AP3 submitted in September 2015	1 - 5 (i.e. this applies in the London area only)
the SES3 scheme	the SES2 scheme with the design changes described in the SES3 submitted in October 2015	4 - 26

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Scheme name	Definition	Relevant CFAs
the AP ₄ revised scheme	the SES ₃ scheme as amended by the AP ₄ submitted in October 2015	4 - 26

- 1.1.5 SES₃ (Part 1 of this report) contains updated environmental baseline information and describes changes to the scheme that have occurred within the current limits and powers of the Bill, and therefore do not require an AP to the Bill. This includes:
- new baseline information with respect to traffic and transport surveys; and
 - changes to the design or to construction assumptions which do not require changes to the Bill.
- 1.1.6 Design changes assessed within the SES₃ for this CFA include the provision of landscape and noise mitigation.
- 1.1.7 The changes are described in Part 1 under a series of sub-headings and assessed on a topic by topic basis using the same approach adopted in the main ES.
- 1.1.8 The purpose of SES₃ is to provide an assessment of any new or different likely significant environmental effects arising from the changes described.
- 1.1.9 There were no SES₂ changes in this CFA, so the SES₃ changes are compared to the SES scheme. There were AP₁ and AP₂ amendments, so these are taken into account as appropriate.
- 1.1.10 The AP₄ 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. The amendment assessed within the AP₄ ES for this CFA includes the relocation of a proposed footpath overbridge.
- 1.1.11 The AP₄ ES assesses each amendment separately for all relevant topics. The purpose of the AP₄ ES is to provide an assessment of any new or different likely significant environmental effects arising from the amendments compared to the SES₃ scheme, taking into account AP₁ and AP₂ amendments where relevant.
- 1.1.12 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) submitted in support of the Bill. Implementation of these measures has been assumed in this SES₃ and AP₄ ES.

Part 1: Supplementary Environmental Statement 3

2 Summary of changes

2.1 New environmental baseline information

Traffic and transport

2.1.1 Additional traffic surveys have been undertaken at junctions in this area to supplement the information reported in the main ES. The impacts of traffic associated with HS2 construction have been re-assessed in the context of this supplementary traffic data. The assessment of the additional baseline data is reported in Section 3.

2.1.2 Details of the survey data are included in SES3 and AP4 ES, Volume 5: Appendix TR-001-000.

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

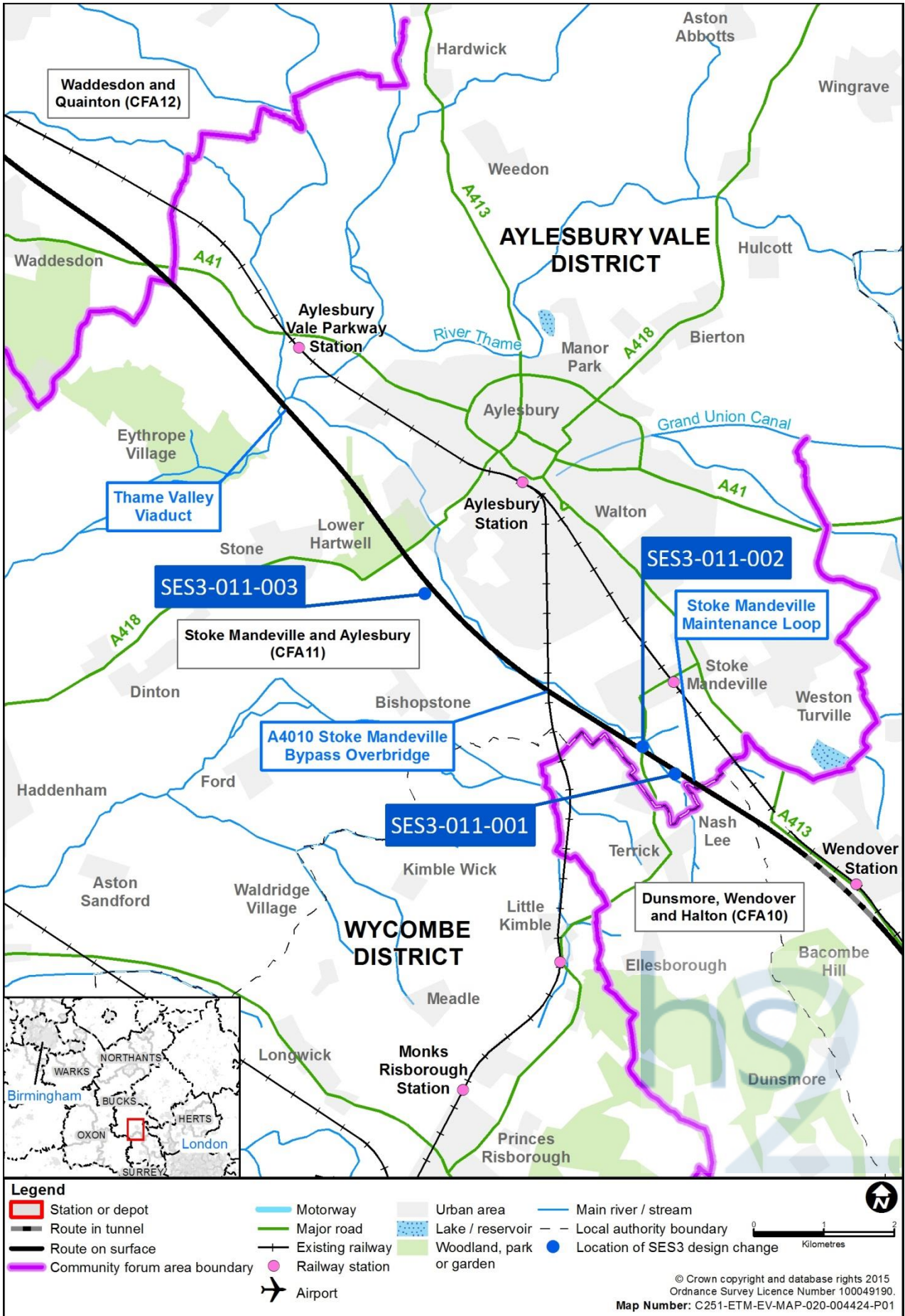
2.2.1 Table 2 provides a summary of the changes to the design or construction assumptions not requiring a change to the Bill which will result in new or different significant effects in the Stoke Mandeville and Aylesbury community forum area (CFA11). Figure 1 shows the locations of the changes.

Table 2: Summary of changes to the design or construction assumptions not requiring a change to the Bill in CFA11

Name of design change or construction assumption	Description of the SES scheme	Description of the SES3 scheme
Provision of landscape mitigation planting at Stoke Mandeville (SES3-011-001)	The SES scheme includes provision of a permanent maintenance loop approximately 1.2km long at Stoke Mandeville. An access track will be provided along both sides of the maintenance loop with access/egress from Nash Lee Lane on the east side and B4009 Nash Lee Road on the west side of the HS2 route. Wet grassland/fen habitat will be created along the west side of the HS2 route.	The creation of an area of woodland within the proposed wet grassland, along approximately 530m of the HS2 route, in order to partially screen the sidings from views from the Chilterns escarpment.
Provision of landscape mitigation planting near the A4010 Risborough Road (SES3-011-002)	The SES scheme includes provision of hedgerow planting along the embankments of the HS2 route on both sides, from south of Stoke House to south of Old Risborough Road.	The replacement of the proposed hedgerow with a belt of trees in order to help screen views from Stoke House and properties along Old Risborough Road.
Provision of a noise barrier at Sedrup ditch (SES3-011-003)	The SES scheme does not include the provision of noise mitigation on the west side of the HS2 route in the vicinity of Sedrup Lane, Stone.	The erection of a 3m high noise fence barrier along the west side of the HS2 route, to the east of Sedrup Lane, for a length of approximately 350m to reduce operational noise effects in Sedrup.

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Figure 1: Locations of design changes not requiring a change to the Bill in CFA11



Description of changes to the design or construction assumptions

Provision of landscape mitigation planting at Stoke Mandeville (SES3-011-001)

- 2.2.2 The Bill provides for a permanent maintenance loop¹ approximately 1.2km long at Stoke Mandeville. An access track would be provided along both sides of the maintenance loop with access/egress from Nash Lee Lane on the east side and B4009 Nash Lee Road on the west side of the HS2 route. An area of ecological mitigation of approximately 3ha would be provided to the west of the HS2 route, along the west of a realigned section of the Stoke Brook, and north of Footpath ELL/20 to create wet grassland habitat and create a receptor site for grass snake (refer to maps CT-05-04ob and CT-06-04ob in the main ES Volume 2, CFA11 Map Book).
- 2.2.3 Since submission of the Bill, further consideration has been given to screen views of the proposed Stoke Mandeville maintenance loop from the viewpoint at Coombe Hill, on the north side of the Chilterns Ridge. An area of wet woodland planting approximately 530m long and 30m wide is proposed on the west of the HS2 route. This will provide greater landscape screening of the maintenance loop from the south and west. The wet woodland is located within the wet grassland habitat proposed as compensation in the original scheme, as receptor sites for reptiles translocated from the Aylesbury Park Golf Club (refer to maps CT-05-04ob and CT-06-04ob in the SES3 and AP4 ES Volume 2, CFA11 Map Book).
- 2.2.4 The land required for this design change is within the original limits of the Bill and therefore no amendment to the Bill is required.
- 2.2.5 The design change results in new or different significant effects for landscape and visual assessment. In addition it involves changes to areas identified for provision of ecological mitigation. An assessment of these changes is reported in Section 3.

Provision of landscape mitigation planting near the A4010 Risborough Road (SES3-011-002)

- 2.2.6 The Bill provides for hedgerow planting along both sides of the HS2 route, from south of Stoke House on the A4010 Risborough Road to south of Old Risborough Road, to screen views of the railway embankment, overhead line equipment and the noise fence barriers from nearby residential properties (refer to map CT-06-041 in the main ES Volume 2, CFA11 Map Book). The hedgerow would be approximately 470m long on the east side and 560m long on the west side of the HS2 route, located at the foot of the railway embankment.
- 2.2.7 Since submission of the Bill, the opportunity to further reduce visual intrusion of the structures has been considered. The hedgerow proposed in the original scheme will be replaced with a belt of woodland, for a length of approximately 650m on both sides of the HS2 route. The planting will extend up to 30m from the foot of the railway embankment (refer to map CT-06-041 in the SES3 and AP4 ES Volume 2, CFA11 Map Book).

¹ A maintenance loop is a sidings that allows maintenance to be carried out at night at more remote locations.

- 2.2.8 The land required for this design change is within the original limits of the Bill and therefore no amendment to the Bill is required.
- 2.2.9 The design change results in new or different significant effects for agriculture, forestry and soils; community; cultural heritage; and landscape and visual assessment and these are reported in Section 3.

Provision of a noise barrier at Sedrup ditch (SES3-011-003)

- 2.2.10 The Bill does not provide for noise mitigation on the west side of the HS2 route in the vicinity of Sedrup, Stone (refer to maps CT-05-043 (grid references E7, F7) and CT-06-043 (E7, F7) in the main ES Volume 2, CFA11 Map Book).
- 2.2.11 Since submission of the Bill, further assessment work has identified the need to provide operational noise mitigation for Sedrup. The design change provides a 3m high noise fence barrier along the west side of the HS2 route, to the east of Sedrup Lane, for a length of approximately 350m. The noise fence barrier will extend from Footpath SBH/27 overbridge northwards to join the noise fence barrier located to the south of the A418 Oxford Road (refer to maps CT-05-043 and CT-06-043 in the SES3 and AP4 ES Volume 2, CFA11 Map Book).
- 2.2.12 The land required for this design change is within the original limits of the Bill and therefore no amendment to the Bill is required.
- 2.2.13 The design change results in new or different significant effects for landscape and visual assessment; and sound, noise and vibration and these are reported in Section 3.

2.3 Topics included in the SES3 assessment

- 2.3.1 The changes described above in Sections 2.1 to 2.2 result in new or different significant effects in respect of: agriculture, forestry and soils; community, cultural heritage; landscape and visual; sound, noise and vibration; and traffic and transport. In addition it involves an assessment of changes to areas identified for the provision of ecological mitigation.

3 Assessment of changes

3.1 Agriculture, forestry and soils

Introduction

- 3.1.1 This section of the report describes the environmental baseline in relation to agriculture, forestry and soils that is relevant to the assessment. It then identifies any new or different likely significant environmental effects as a result of the changes introduced in Section 2, compared to those of the SES scheme.
- 3.1.2 Consideration is given to the permanent requirement for farmland.

Scope, assumptions and limitations

- 3.1.3 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) (Volume 5:

Appendix CT-001-000/1) and the SMR Addendum (Volume 5: Appendix CT-001-000/2) of the main ES.

- 3.1.4 The area of agricultural land affected by the SES3 changes is relatively small (1.8ha) and will not alter the significance of effect, or result in a different significant effect, on best and most versatile (BMV) agricultural land or forestry land within the Stoke Mandeville and Aylesbury area. The route-wide effects on BMV land and forestry land are reported in Volume 3.

SES3 changes of relevance to this assessment

- 3.1.5 The change that is relevant to this assessment is the provision of landscape mitigation planting near the A4010 Risborough Road (SES3-011-002).

Environmental baseline

Existing baseline

- 3.1.6 Three holdings would be affected by the SES3 design change. Stoke House (holding reference number CFA11/1) is a 93ha holding used for arable crops and with grazing for equestrian liveryes; Windrush House, Terrick (CFA11/2) extends to 104ha and is used for arable crops and grazing; Mill House Farm (CFA11/3) is a 3.2ha smallholding engaged in poultry production as reported in the main ES (Volume 2, CFA11, Section 3).

Future baseline

Construction (2017)

- 3.1.7 Volume 5: Appendix CT-004-000 of the SES3 and AP4 ES provides details of the developments which are assumed to have been implemented by 2017, additional to those identified in the main ES and the SES and AP2 ES.
- 3.1.8 A single committed housing development immediately to the south of Aylesbury extending to 9.0ha has been identified in this local area and is likely to comprise BMV agricultural land. If this committed development has commenced by 2017 the area of BMV land in the local area will have been marginally reduced. In all other respects the future baseline for construction in 2017 remains unchanged from that reported in the main ES.
- 3.1.9 Most existing Environmental Stewardship agreements will expire in 2015 and will be replaced by a new environmental land management scheme (Countryside Stewardship) which, together with the new greening measures introduced by Common Agricultural Policy reform, will affect the detailed management of individual farm holdings, but are not expected to change fundamentally the baseline circumstances described.

Operation (2026)

- 3.1.10 Volume 5: Appendix CT-004-000 of the SES3 and AP4 ES provides details of the developments which are assumed to have been implemented by 2026, additional to those identified in the main ES and the SES and AP2 ES.

- 3.1.11 Other than the housing development referred to for the future baseline during construction, none of the identified developments affect the assessment of the SES₃ scheme's likely operational impacts on agriculture, forestry and soils.

Effects arising during construction

Avoidance and mitigation measures

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

Assessment of impacts and effects

Temporary effects

- 3.1.13 There will be no temporary effects arising from this design change.

Permanent effects

- 3.1.14 A further 0.9ha of land will be permanently required from Stoke House. This increases the total area removed to 13.9ha which represents 15% of the holding. However, the requirement for 13.0ha for the construction of the SES scheme already represented 14% of the holding and was assessed as a moderate adverse effect, which is significant, due to the proportion of the holding required. The change to landscape mitigation planting near the A4010 Risborough Road will therefore not give rise to a new or different significant effect on Stoke House and will not change the level of significance of the effects reported in the main ES (Volume 2, CFA₁₁, Section 3).
- 3.1.15 A further 0.5ha of land will be required from Windrush House, Terrick. This increases the total area required to 6.7ha which represents 6% of the holding. However, the requirement for 6.2ha for the construction of the SES scheme already represented 6% of the holding and was assessed as a negligible effect, which is not significant, due to the proportion of the holding required and low sensitivity to change. The change to landscape mitigation planting near the A4010 Risborough Road will therefore not give rise to a new or different significant effect on Windrush House and will not change the level of significance of the effects reported in the main ES (Volume 2, CFA₁₁, Section 3).
- 3.1.16 A further 0.4ha of land will be required from Mill House Farm. This increases the total area removed to 1.0ha which represents 31% of the holding. The requirement for 0.6ha for the construction of the SES scheme represented 18% of the holding and was assessed as a moderate adverse effect, which is significant, due to the proportion of the holding required (Volume 2, CFA₁₁, Section 3 of the main ES). As the additional land for this design change increases the area of land required to 31%, this will change the level of significance of effects reported in the main ES from moderate to major/moderate, which is significant.

Other mitigation measures

- 3.1.17 There are no additional mitigation measures to those identified in the main ES.

Cumulative effects

- 3.1.18 There are no new or different likely significant cumulative effects for agriculture, forestry and soils as a result of the SES₃ changes interacting with one another or any relevant committed development.

Summary of likely residual significant effects

- 3.1.19 The change to landscape mitigation planting near the A4010 Risborough Road will increase the land permanently required at Mill House Farm from 18% to 31% of the holding. This will give rise to a different likely residual significant effect and will change the level of significance of the effect on the holding reported in the main ES from moderate adverse to major/moderate adverse, which is significant (refer to maps AG-01-021b and AG-01-022 in the main ES, Agriculture, Forestry and Soils Map Book).

Effects arising from operation

- 3.1.20 The SES₃ changes do not change the operation of the scheme and so there are no new or different significant operation effects for agriculture, forestry and soils as a result of the proposed SES₃ changes, in comparison with the main ES.

3.2 Community

Introduction

- 3.2.1 This section of the report describes the environmental baseline in relation to community that is relevant to the assessment. It then identifies any new or different likely significant environmental effects as a result of the changes introduced in Section 2, compared to those of the SES scheme.
- 3.2.2 Consideration is given to impacts on residential properties, community resources, amenity, open space and PRoW.

Scope, assumptions and limitations

- 3.2.3 The assessment scope, key assumptions and limitations for community are as set out in Volume 1, the SMR (Volume 5: Appendix CT-001-000/1) and the SMR Addendum (Volume 5: Appendix CT-001-000/2) of the main ES.

SES₃ changes of relevance to this assessment

- 3.2.4 The change that is relevant to this assessment is the provision of landscape mitigation planting near the A4010 Risborough Road (SES₃-011-002).

Environmental baseline

Existing baseline

- 3.2.5 Residential properties on the Old Risborough Road, to the south of Stoke Mandeville, are located within 100m of the change to landscape mitigation planting near the A4010 Risborough Road (refer to Volume 2, CFA11, Section 5 of the main ES).

Future baseline

Construction (2017)

- 3.2.6 Volume 5, Appendix CT-004-000 of the SES₃ and AP₄ ES provides details of the developments that are assumed to have been implemented by 2017, additional to those identified in the main ES and the SES and AP₂ ES.
- 3.2.7 None of the identified developments affect the assessment of the SES₃ scheme's likely construction impacts on community.

Operation (2026)

3.2.8 Volume 5, Appendix CT-004-000 of the SES3 and AP4 ES provides details of the developments that are assumed to have been implemented by 2017, additional to those identified in the main ES and the SES and AP2 ES.

3.2.9 None of the identified developments affect the assessment of the SES3 scheme's likely operational impacts on community.

Effects arising during construction

3.2.10 There are no new or different significant construction effects for community as a result of the proposed SES3 changes, in comparison with the main ES and SES.

Effects arising during operation

Avoidance and mitigation measures

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

Assessment of impacts and effects

3.2.12 The main ES reported a significant permanent operational effect at up to ten residential properties located on Old Risborough Road. This significant effect was due to a combination of significant visual effects and significant operational noise effects.

3.2.13 The replacement of the hedgerow (as proposed in the original scheme) with the landscape planting on the A4010 Risborough Road will reduce the duration of the visual effect on these properties. As such, combined effects are forecast to be experienced by approximately five properties for up to 15 years rather than permanently.

3.2.14 Whilst the duration of the combined effects has been reduced by the design change and fewer residential properties are forecast to experience the effect, as the combined effects are still predicted to last for 15 years and therefore the community effect remains major adverse, as reported in the main ES. The design change does generate a different significant effect for these reasons, however this does not change the level of significance of the effect reported in the main ES.

Other mitigation measures

3.2.15 No new or different mitigation measures are required as set out in Volume 2, CFA11, Section 5 of the main ES.

Cumulative effects

3.2.16 There are no new or different likely significant cumulative effects for community as a result of the SES3 changes interacting with one another or any relevant committed development.

Summary of likely residual significant effects

3.2.17 The change to landscape mitigation planting near the A4010 Risborough Road will give rise to a different residual visual effect on the properties on A4010 Risborough

Road due to the reduction in duration of effect and number of properties affected (refer to Volume 5: Appendix CM-001-011 of the SES3 and AP4 ES and mapCM-01-034 in the SES3 and AP4 ES, Community Map Book). However, this will not change the level of significance of the major adverse residual effects reported in the main ES.

3.3 Cultural heritage

Introduction

- 3.3.1 This section of the report describes the environmental baseline in relation to cultural heritage that is relevant to the assessment. It then identifies any new or different likely significant environmental effects as a result of the changes introduced in Section 2, compared to those of the SES scheme. There are no AP1 or AP2 amendments that are relevant to the assessment.
- 3.3.2 Consideration is given to effects upon the value of heritage assets, including effects on their setting, as a result of the changes.

Scope, assumptions and limitations

- 3.3.3 The assessment scope, key assumptions and limitations for cultural heritage are as set out in Volume 1, the SMR (Volume 5: Appendix CT-001-000/1) and the SMR Addendum (Volume 5: Appendix CT-001-000/2) of the main ES.

SES3 changes of relevance to this assessment

- 3.3.4 The SES3 change that is considered in this assessment is the provision of landscape mitigation planting near the A4010 Risborough Road (SES3-011-002).

Environmental baseline

Existing baseline

- 3.3.5 The cultural heritage baseline for the assessment takes into account information collected for the main ES. This includes walkover survey, geophysical survey, remote sensing data, and data from national and local registers. A full list of heritage assets is provided in Volume 2, Section 6 of the main ES. In addition, the baseline was updated in the SES with the results of additional survey work.
- 3.3.6 A summary of the baseline information relevant to the assessment of new or different effects is provided below. For those assets described in the main ES, further details are provided in the baseline reports, gazetteer of heritage assets, impact assessment tables and survey reports in Volume 5 of the main ES and are shown on maps CH-01 (Heritage Assets within Study Area), CH-02 (Designated Heritage Assets) and CH-03 Archaeological Character Sub-zones, as updated in the SES and AP2 ES Volume 5 appendices.

Designated assets

- 3.3.7 The landscape mitigation is approximately 190m south-west of Grade II listed Stoke House (asset reference² SMA007), an asset of moderate heritage value. Views to the

² Asset reference: a unique code for each cultural heritage asset identified within the study area; further detail on these assets can be found in the gazetteer in Volume 5: Appendix CH-002-011 of the main ES.

south from Stoke House and its setting in an agricultural landscape provide a historic context in which the house can be appreciated.

Non-designated assets

- 3.3.8 The Stoke Mandeville village envelope (asset reference SMA096) is approximately 80m to the north of the landscape mitigation, and is an asset of moderate heritage value.

Future baseline

Construction (2017)

- 3.3.9 Volume 5: Appendix CT-004-000 of the SES₃ and AP₄ ES provides details of the developments that are assumed to have been implemented by 2017, additional to those identified in the main ES and the SES and AP₂ ES.
- 3.3.10 None of the identified developments affect the assessment of the SES₃ scheme's likely construction impacts on cultural heritage.

Operation (2026)

- 3.3.11 Volume 5: Appendix CT-004-000 of the SES₃ and AP₄ ES provides details of the developments that are assumed to have been implemented by 2026, additional to those identified in the main ES and the SES and AP₂ ES.
- 3.3.12 None of the identified developments affect the assessment of the SES₃ scheme's likely operational impacts on cultural heritage.

Effects arising during construction

- 3.3.13 There are no new or different significant construction effects for cultural heritage as a result of the proposed SES₃ changes, in comparison with the main ES.

Effects arising from operation

Avoidance and mitigation measures

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

Assessment of impacts and effects

- 3.3.15 In the main ES, a major adverse significant operational effect was reported on Stoke House (asset reference SMA007) and a moderate adverse significant effect was reported on the Stoke Mandeville village envelope (asset reference SMA096). These were as a result of a change in setting from the movement and associated noise of passing trains. The change in setting for both heritage assets was assessed as resulting in a medium adverse impact as reported in the main ES (Volume 2, CFA11, Section 6).
- 3.3.16 The change to landscape mitigation planting near the A4010 Risborough Road will give rise to a different effect on Stoke House (asset reference SMA007) and Stoke Mandeville village envelope (asset reference SMA096). However, this will not reduce the associated noise of the passing trains to an extent that will change the level of impact or level of significant effects reported in the main ES.

Other mitigation measures

- 3.3.17 There will be no change to the mitigation reported in Volume 2, CFA 11, Section 6 of the main ES.

Cumulative effects

- 3.3.18 There are no new or different likely cumulative effects for cultural heritage as a result of the SES₃ changes interacting with one another or any committed developments.

Summary of likely residual significant effects

- 3.3.19 The change to landscape mitigation planting near the A4010 Risborough will give rise to a different likely residual significant effect on views from Stoke House (asset reference SMA097) and Stoke Mandeville village envelope (asset reference SMA096) during operation. However, this will not change the level of significance of the major adverse significant effect on Stoke House and the moderate adverse significant effect on the Stoke Mandeville village envelope reported in the main ES (Volume 2, CFA11, Section 6).

3.4 Ecology

Introduction

- 3.4.1 This section of the report describes the environmental baseline in relation to ecology that is relevant to the SES₃ assessment. It then identifies any new or different likely significant environmental effects as a result of the changes introduced in Section 2, compared to those of the SES scheme. Consideration is given to the potential for impacts on species, habitats and sites designated on the basis of their importance for nature conservation.

Scope, assumptions and limitations

- 3.4.2 Updates to the scope of the assessment for ecology are set out in Volume 1 of the SES₃ and AP₄ ES. The key assumptions and limitations, and the methodology for determining significance of effects are as set out in Volume 1, the SMR and the SMR Addendum (Volume 5: Appendix CT001-000/1 and CT-001-000/2 of the main ES) and in Addendum 4 to the SMR (SES₃ and AP₄ ES Volume 5: Appendix CT-001-000/5).
- 3.4.3 To address any limitations in data, a precautionary baseline has been considered according to the guidance reported in the main ES, Volume 5: Appendix CT-001-000/2. This constitutes a 'reasonable worst case' basis for the subsequent assessment. The precautionary approach to the assessment that has been adopted identifies the likely significant ecological effects of the SES₃ scheme.

SES₃ changes of relevance to this assessment

- 3.4.4 The SES₃ change that is considered relevant to this assessment is the provision of landscape mitigation planting at Stoke Mandeville (SES₃-011-001), which has the potential to effect the ecological mitigation provided by the area in which it will be located.

Environmental baseline

Existing baseline

3.4.5 The ecological baseline for the assessment takes into account baseline information collected in support of the main ES, 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 main ES assessment in this area is provided in Volume 2, Section 7 of the main ES. The assessment also takes into account relevant survey information that is reported in Volume 5 of the SES and AP₂ ES.

3.4.6 A summary of the baseline information relevant to the SES₃ assessment is provided below.

Designated sites

3.4.7 There has been no change to the baseline information relating to designated sites as set out in Volume 2, CFA₁₁ of the main ES.

Habitats

3.4.8 There has been no change to the baseline information relating to habitats as set out in Volume 2, CFA₁₁ of the main ES.

Protected and/or notable species

3.4.9 The main ES reports the presence of a population of grass snake at Aylesbury Park Golf Course that is likely to qualify as a 'high size class' in terms of the numbers of individuals present. The population is of up to county/metropolitan value as reported in the main ES.

3.4.10 There has been no change to the relevant baseline information relating to protected and notable species as set out in Volume 2, CFA₁₁ of the main ES.

Future baseline

Construction (2017)

3.4.11 Volume 5: Appendix CT-004-000 of the SES₃ and AP₄ ES provides details of the developments which are assumed to have been implemented by 2017, additional to those identified in the main ES and the SES and AP₂ ES.

3.4.12 None of the identified developments affect the assessment of the SES₃ scheme's likely construction impacts on ecology.

Operation (2026)

3.4.13 Volume 5: Appendix CT-004-000 of the SES₃ and AP₄ ES provides details of the developments which are assumed to have been implemented by 2026, additional to those identified in the main ES and the SES and AP₂ ES.

3.4.14 None of the identified developments affect the assessment of the SES₃ scheme's likely operational impacts on ecology.

Effects arising during construction

Avoidance and mitigation measures

- 3.4.15 The assessment assumes implementation of the measures set out within the draft CoCP (Volume 5: Appendix CT-003-000 of the main ES), which includes translocation of protected species where appropriate.

Assessment of impacts and effects

Designated sites

- 3.4.16 The change to landscape mitigation planting at Stoke Mandeville will not give rise to new or different significant effects on designated sites, and will not change the level of significance of the effects reported in the main ES.

Habitats

- 3.4.17 The change to landscape mitigation planting at Stoke Mandeville will not give rise to a new or different significant effect on habitats and will not change the level of significance of the effects reported in the main ES.

Protected and/or notable species

- 3.4.18 The main ES reported that the construction of the original scheme will remove approximately 11ha of grassland and scrub at Aylesbury Park Golf Club that contains foraging, shelter and breeding habitat for a population of grass snake. This will result in a permanent adverse effect on the conservation status of this population that is significant at up to the county/metropolitan level. The grassland and scrub at Aylesbury Park Golf Club required in the SES₃ scheme is the same as for the original scheme and therefore no new or different effect on grass snake is expected.
- 3.4.19 It is unlikely that the design change will result in any other new or different effects on species receptors of relevance at more than the local/parish level. Local/parish level effects which are in addition to those identified in the main ES and the SES and AP₂ ES are listed in Volume 5: Appendix EC-003-002 of the SES₃ and AP₄ ES.

Cumulative effects

- 3.4.20 There are no new or different likely significant cumulative effects for ecology as a result of the new baseline data or SES₃ changes interacting with one another or with any committed developments.

Other mitigation measures

- 3.4.21 The original scheme provided for two habitat creation areas with a total area of approximately 5.5ha to provide receptor sites for reptiles translocated from the Aylesbury Park Golf Club. The SES₃ design change will reduce the extent of damp grassland in one of these potential receptors sites by approximately 1.2ha, from 3ha to 1.8ha, and replace it with woodland planting. The retained 1.8ha area of damp grassland remains a suitable receptor site for grass snake. In addition the areas of woodland planting are likely to provide suitable habitat for use by grass snake during the period of establishment, and when mature will provide shelter and cover that will form part of the wider habitat mosaic. The revised mitigation proposed in the SES₃

scheme therefore remains sufficient to mitigate the adverse effect on the conservation status of the grass snake population at Aylesbury Park Golf Club.

Summary of likely residual significant effects

- 3.4.22 The change to landscape mitigation planting at Stoke Mandeville will not give rise to new or different likely residual significant effects on ecological receptors and will not change the level of significance of the effects reported in the main ES.

Effects arising from operation

- 3.4.23 The SES₃ changes do not change the operation of the scheme and so there are no new or different significant operation effects for ecology as a result of the proposed SES₃ changes, in comparison with the main ES.

3.5 Landscape and visual assessment

Introduction

- 3.5.1 This section of the report describes the environmental baseline in relation to landscape and visual that is relevant to the assessment. It then identifies any new or different likely significant environmental effects as a result of the changes introduced in Section 2, compared to those of the SES scheme.
- 3.5.2 Consideration is given to the changes on landscape character and views and to the identification of new visual receptors, not previously included in the main ES.

Scope, assumptions and limitations

- 3.5.3 The assessment scope, key assumptions and limitations for landscape and visual assessment are as set out in Volume 1, the SMR (Volume 5: Appendix CT-001-000/1) and the SMR Addendum (Volume 5: Appendix CT-001-000/2) of the main ES. An update to the methodology for the landscape and visual assessment is also described in Volume 1 of the AP₁ ES.

SES₃ changes of relevance to this assessment

- 3.5.4 The following SES₃ design changes are considered in this assessment:
- provision of landscape mitigation planting at Stoke Mandeville (SES₃-011-001);
 - provision of landscape mitigation planting near the A4010 Risborough Road (SES₃-011-002); and
 - provision of a noise barrier at Sedrup ditch (SES₃-011-003).

Environmental Baseline

Existing baseline

- 3.5.5 A summary of the baseline information in the main ES relevant to the assessment of the SES₃ design changes is provided below. Further details are provided in the main ES Volume 2, CFA11, Section 9 and Volume 5, CFA11, Appendix LV-001-011. Maps are provided in the main ES Volume 5, Landscape Map Book LV-001-011.

- 3.5.6 The areas affected by the changes to landscape mitigation planting are within the Stoke Mandeville Vale Landscape Character Area (LCA), which is described in the main ES (Volume 2, CFA₁₁, Section 9). This LCA is low lying, with little topographical variation. Land use is largely agricultural and a number of transport routes cross the area, including the A₄₁₃, the A₄₀₁₀ and the Marylebone to Aylesbury Line. The Chilterns escarpment to the south forms the backdrop to many views. The Stoke Mandeville LCA has a low sensitivity to change.
- 3.5.7 The area affected by the Sedrup noise barrier (SES₃-011-003) is in the Haddenham Vale LCA, which is described in the main ES (Volume 2, CFA₁₁, Section 9). This LCA is low lying, with little settlement, woodland or transport infrastructure. Agricultural land predominantly comprises large-scale arable fields, with smaller scale pastoral fields located adjacent to watercourses. Tranquillity is high. The Haddenham Vale LCA has a medium sensitivity to change.
- 3.5.8 Views from dwellings (Viewpoint 111.2.001: view east from dwellings on Old Risborough Road; Viewpoint 112.2.002: view south-west from Stoke House, Stoke Mandeville; Viewpoint 112.4.001: view west from A₄₀₁₀ Risborough Road, Stoke Mandeville; and Viewpoint 119.2.002: view east from Sedrup Farm, Sedrup) are located in close proximity to the SES₃ design changes and are described in the main ES (Volume 2, CFA₁₁, Section 9).

Future baseline

Construction (2017)

- 3.5.9 Volume 5: Appendix CT-004-000 of the SES₃ and AP₄ ES provides details of the developments which are assumed to have been implemented by 2017, additional to those identified number in the main ES and the SES and AP₂ ES.
- 3.5.10 None of the identified developments affect the assessment of the SES₃ scheme's likely construction impacts on landscape character and visual amenity.

Operation (2026)

- 3.5.11 Volume 5: Appendix CT-004-000 of the SES₃ and AP₄ ES provides details of the developments which are assumed to have been implemented by 2026, additional to those identified in the main ES and the SES and AP₂ ES.
- 3.5.12 None of the identified developments affect the assessment of the SES₃ scheme's likely operational impacts on landscape character and visual amenity.

Effects arising during construction

- 3.5.13 There are no new or different significant construction effects for the landscape and visual assessment as a result of the proposed SES₃ changes, in comparison with the main ES.

Permanent effects arising during operation

Avoidance and mitigation measures

- 3.5.14 The operational assessment of impacts and effects is based on year 1 (2026), year 15 (2041) and year 60 (2086). A process of iterative design and assessment has been employed to avoid or reduce adverse effects during the operation of the SES₃

scheme. Measures that have been incorporated into the design of the SES3 scheme are intended to reduce the prominence of the proposed infrastructure in the landscape from representative viewpoints. These measures have been taken into account in the assessment of the operational effects.

Assessment of impacts and effects

Landscape assessment

- 3.5.15 The main ES reported a moderate adverse significant effect on the Stoke Mandeville Vale LCA in year 1 of operation, reducing to non-significant by year 15 and beyond due to the presence of engineered landforms cutting across the natural landform, PRow crossings, overhead line equipment, noise fence barriers, trains, the new A4010 Stoke Mandeville bypass, the rail maintenance loop, access track, and Princes Risborough to Aylesbury rail overbridge.
- 3.5.16 In year 1 of operation, the additional planting (SES3-011-001 and SES3-011-002) will be immature and the HS2 route will form a noticeable element. Therefore, it will not give rise to a new or different significant effect and will not change the level of significance of the moderate adverse significant effects reported in the main ES on the Stoke Mandeville Vale LCA. By year 15 and beyond to year 60 the additional planting will have become established, reducing the effects of the scheme in the Stoke Mandeville Vale LCA from moderate adverse in year one to minor adverse, which is not significant. The additional planting will not give rise to a new or different significant effect and will not change the level of effect reported in the main ES for year 15 and year 60.
- 3.5.17 The main ES reported a moderate adverse significant effect on the Haddenham Vale LCA during years one and 15 of operation due to the incongruous nature of mitigation earthworks, the presence of overhead line equipment, trains, PRow crossings, the A418 Oxford Road overbridge and the presence of noise fence barriers forming distinct linear features in contrast with the rural landscape. By year 60, the mitigation planting would be mature therefore the effect is reported as non-significant.
- 3.5.18 The additional 350m of 3m high noise fence barrier on the southern side of the track (SES3-011-003) will increase the total length of the barrier along this stretch of the track. The SES scheme includes provision for noise fence barrier for long stretches along both sides of the track in this area and, therefore, the additional noise fence barrier will be a small addition to the scheme. Consequently, the SES3 change will not give rise to new or different significant effects or change the level of significance of the effects reported in the main ES.

Visual assessment

- 3.5.19 Four viewpoints with potential views of the SES3 design changes were assessed as being affected by the SES scheme due to the presence of the HS2 embankment, overhead line equipment, noise fence barriers, trains, a pylon, Risborough Road underpass and opening up of new views.
- 3.5.20 These viewpoints are described in the main ES (Volume 2, CFA11, Section 9). The viewpoints, with the effects reported in the main ES in brackets, are:
- Viewpoint 111.2.001: view east from dwellings on Old Risborough Road (major

adverse significant in year one, 15 and 60 of operation);

- Viewpoint 112.2.002: view south-west from Stoke House, Stoke Mandeville (moderate adverse significant in year one and 15 and non-significant by year 60);
- Viewpoint 112.4.001: view west from A4010 Risborough Road, Stoke Mandeville (moderate adverse significant in year one, 15 and 60 of operation); and
- Viewpoint 119.2.002: view east from Sedrup Farm, Sedrup (negligible and non-significant in year 1, 15 and 60).

- 3.5.21 The planting proposed along the southern side of the route (SES₃-011-001 and SES₃-011-002) from Viewpoint 111.2.001: view east from dwellings on Old Risborough Road will not provide any screening in year 1 of operation. However, by year 15, the planting will partially screen the embankment, the overhead line equipment, the noise fence barriers and the trains. By year 60, when the planting is further established, the HS₂ route will be fully screened. Consequently, the SES₃ design change will not alter the level of significance of the effects reported in the main ES in year 1. However, by year 15 of operation the change will give rise to a different significant effect and this will change the level of significance of the effects reported in the main ES from major to moderate adverse and by year 60 the effect will change from major to minor adverse, which is non-significant.
- 3.5.22 The planting proposed along the northern side of the route (SES₃-011-002) will not provide any screening of the scheme, from Viewpoint 112.2.002: view south-west from Stoke House, Stoke Mandeville, in year 1 of operation. However by year 15, the planting in summer will almost fully screen the embankment, the overhead line equipment, the noise fence barriers and the trains. By year 60 when the planting is further established, the line will be fully screened. Consequently, the SES₃ design change 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 in year 1 of operation. The planting will reduce the level of significance of the effects reported in the main ES from moderate adverse to minor adverse in year 15, which is non-significant. The effects will remain non-significant in year 60 of operation, as reported in the main ES.
- 3.5.23 The planting along the northern side of the route (SES₃-011-002) will not provide any screening from Viewpoint 112.4.001: view west from A4010 Risborough Road, Stoke Mandeville in year 1 of operation. However, by year 15 of operation, the planting in summer will partially screen the embankment, the overhead line equipment, the noise fence barriers and trains. By year 60 when the planting is further established, the line will be almost fully screened. Consequently, the SES₃ design change will not give rise to a different significant effect and will not change the level of significance of the effects reported in the main ES in year 1 of operation. However, the landscape mitigation planting near the A4010 Risborough Road will give rise to a different significant effect and will change the level of significance of the effects reported in the main ES from moderate adverse significant effect to minor adverse, which is non-significant, in years 15 and 60 of operation.

Other mitigation measures

- 3.5.24 The permanent effects of the SES scheme on landscape and visual receptors have been substantially reduced through incorporation of the SES₃ design changes. Effects in year 1 of operation may be further reduced by establishing planting early in the construction programme, which will be considered during the detailed design stage. This would provide additional screening and greater integration of the SES₃ scheme into the landscape. However, no other mitigation measures are considered practicable due to the high visibility of elements of the SES₃ scheme and the sensitivity of the surrounding receptors.

Cumulative effects

- 3.5.25 There are no new or different likely cumulative landscape and visual effects as a result of the SES₃ design changes interacting with one another or any relevant committed developments.

Summary of likely residual significant effects

- 3.5.26 As no other mitigation measures are considered practicable, the likely permanent residual significant effects during operation remain.
- 3.5.27 The following viewpoints will experience different visual effects during operation resulting from the landscape mitigation planting at Stoke Mandeville and landscape mitigation planting near the A4010 Risborough Road (refer to map LV-04-038b in the main ES, Volume 2, CFA11 Map Book):
- Viewpoint 111.2.001: view east from dwellings on Old Risborough Road, where the SES₃ design changes will result in a change in the level of significance of the effects reported in the main ES from major to moderate adverse significant effect in year 15. By year 60 the effect is changed from major adverse to minor adverse, which is non-significant;
 - Viewpoint 112.2.002: view south-west from Stoke House, Stoke Mandeville, where the SES₃ design changes will change the level of significance of the effects reported in the main ES from moderate significant adverse to minor, non-significant adverse in year 15 (refer to photomontage LV-01-060 in the SES₃ and AP₄ ES, Volume 2, CFA11 Map Book); and
 - Viewpoint 112.4.001: view west from A4010 Risborough Road, Stoke Mandeville, where the SES₃ design changes will change the level of significance of the effects reported in the main ES from moderate significant adverse to minor, non-significant adverse in year 15 and year 60.

3.6 Sound, noise and vibration

Introduction

- 3.6.1 This section of the report describes the environmental baseline in relation to sound, noise and vibration that is relevant to the assessment. It then identifies any new or different likely significant environmental effects as a result of the changes introduced in Section 2 compared to the SES scheme.

- 3.6.2 Consideration is given to changes in construction and operational noise.

Scope, assumptions and limitations

- 3.6.3 The assessment scope, key assumptions and limitations for the sound, noise and vibration assessment are as set out in Volume 1, the SMR (Volume 5: Appendix CT-001-000/1) and the SMR Addendum (Volume 5: Appendix CT-001-000/2) of the main ES.
- 3.6.4 Local assumptions and limitations for sound, noise and vibration are set out in the main ES (Volume 2, CFA 11, Section 11).

SES₃ changes of relevance to this assessment

- 3.6.5 The provision of a noise barrier at Sedrup ditch (SES₃-011-003) is relevant to this assessment.

Environmental baseline

Existing baseline

- 3.6.6 The existing baseline for sound and vibration information for this area for is described in the main ES (Volume 2, CFA11, Section 11). Baseline sound levels representative of the assessment locations affected by the SES₃ design change have been used in the construction and operational assessments.
- 3.6.7 The village of Sedrup is located approximately 600m to the west of the HS2 route. Typical of the less populated parts of this area away from Aylesbury, the soundscape generally includes the sound of distant traffic and, in some locations, agricultural activities and natural sounds are also audible. In these locations daytime sound levels are approximately 43db to 50dB with night-time levels around 5db to 10dB lower, as reported in the main ES (Volume 2, CFA11, Section 11).

Future baseline

Construction (2017 and 2021)

- 3.6.8 The future baseline for construction in 2017, and construction traffic in 2021, remains unchanged from that reported in the main ES (Volume 2, CFA11, Section 11).

Operation (2026)

- 3.6.9 The future baseline for operation in 2026 remains unchanged from that reported in the main ES (Volume 2, CFA11, Section 11).

Effects arising during construction

- 3.6.10 There are no new or different significant construction effects for sound, noise and vibration as a result of the proposed SES₃ changes, in comparison with the main ES.

Effects arising from operation

Avoidance and mitigation measures

- 3.6.11 The design change includes the provision for operational noise mitigation in the form of noise fence barriers at Sedrup ditch. This proposed mitigation is in addition to the mitigation identified within the main ES (Volume 2, CFA11, Section 11).

Assessment of impacts and effects

- 3.6.12 The original scheme identified a likely significant adverse noise effect at the community represented by approximately 10 properties at Sedrup in the vicinity of Sedrup Lane, identified as OSV11-Co5³ on map SV-05-022 in the main ES, Volume 2, CFA₁₁ Map Book.
- 3.6.13 An assessment has been undertaken to determine whether operational noise levels from the design change would result in a new or different likely significant effect, using the significance criteria detailed in the main ES (Volume 5: Appendix SV-001-000).
- 3.6.14 The predicted operational sound and vibration levels as a result of this design change are presented in the Table 3.

³ Significant operation related noise effects are identified with a unique identification number, OSVXX-XXX. Further detail on these effects can be found in Volume 5, Appendix SV-004-011 of the main ES.

SES₃ and AP₄ ES Volume 2 – CFA11, Stoke Mandeville and Aylesbury

Table 3: Operational airborne sound level, noise impacts and effects

Assessment Location		Impact criteria										Significance criteria							Significant effect	
ID	Area represented	SES scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (Opening year baseline + year 15 traffic) ⁴		Change with SES ₃ scheme		Type of effect ⁵	Number of impacts represented	Type of receptor ⁶	Receptor design ⁷	Existing environment	Unique feature	Combined impact		Mitigation of effect
		D ⁸	N ⁹	M ¹⁰	D	N	M	D	N	D	N									
304833	Sedrup, Hartwell	43	34	63/66	47	40	51	49	41	2	1	NA	4	R	T	-	-	-	-	
304968	Sedrup, Hartwell	44	33	55/57	49	43	51	50	43	1	0	NA	1	R	T	-	-	-	-	
305037	Sedrup, Hartwell	41	31	54/57	49	43	51	50	43	1	0	NA	1	R	T	-	-	-	-	
319163	Sedrup, Hartwell	45	35	65/68	46	39	51	49	40	3	1	NA	5	R	T	-	-	-	-	# ¹¹
319187	Sedrup, Hartwell	46	37	68/71	47	40	51	50	42	3	2	NA	1	R	T	-	-	-	-	#

⁴ Where the SES₃ scheme modifies an existing source, e.g. realignment of an existing road, the scheme only level in the table includes the sound from the modified source. In this situation the Do something (opening year baseline + year 15 traffic) level has been adjusted to avoid double counting the sound associated with the existing sound source.

⁵ NA - generally no adverse effect; A - adverse effect; S - significant adverse effect. For further information refer to the main ES Volume 5: Appendix SV-001-000.

⁶ R - residential.

⁷ T - traditional building construction.

⁸ D - Day - L_{pAeq,07:00-23:00}

⁹ N - Night - L_{pAeq,23:00-07:00}

¹⁰ M - Max - L_{pAFmax}. In the SES scheme only column, two values are presented. The first is the value for the HS2 mitigated train and the second is the value for a train that has passed by sound levels that are equal to the 2008 TSI limits. For further information refer to the main ES Volume 5: Appendix SV-001-000.

¹¹ #- The forecast adverse effects are not considered to be significant on a community basis (further information on methodology is provided in the main ES Volume 5: Appendix SV-001-000).

- 3.6.15 The design change to provide a noise barrier at Sedrup ditch will ensure that the significant operational noise effect, OSV₁₁-Co₅, on the community of Sedrup arising from the original scheme will not occur.
- 3.6.16 The change to provide a noise barrier at Sedrup ditch does not alter the predicted operational ground-borne noise or vibration levels presented in the main ES.

Other mitigation measures

- 3.6.17 The design change comprises mitigation that is in addition to the mitigation measures proposed in the main ES (Volume 2, CFA 11, Section 11).

Cumulative effects

- 3.6.18 There are no new or different likely significant cumulative effects for sound, noise and vibration as a result of the SES₃ changes interacting with one another or any relevant committed development

Summary of likely residual significant effects

- 3.6.19 The provision of a noise barrier at Sedrup ditch will reduce operational noise at the community of Sedrup such that the effects are no longer significant. This will therefore remove the significant effect, OSV₁₁-Co₅ reported in the main ES (refer to map SV-01-022 and SV-02-022 in the main ES, Volume 5, Sound, noise and vibration Map Book).

3.7 Traffic and transport

Introduction

- 3.7.1 This section of the report describes the environmental baseline in relation to traffic and transport that is relevant to the assessment. It then identifies any new or different likely significant environmental effects as a result of the changes introduced in Section 2, compared to the SES scheme taking into account any relevant AP₂ amendments.

Scope, assumptions and limitations

- 3.7.2 The assessment scope, key assumptions and limitations for traffic and transport are as set out in Volume 1, the SMR (Volume 5: Appendix CT-001-000/1) and the SMR Addendum (Volume 5: Appendix CT-001-000/2) of the main ES.

SES3 changes of relevance to this assessment

- 3.7.3 Supplementary traffic data has been collected at the following highway junctions and sections of road that are the subject of re-assessment:

- A4157 Elmhust Road / A418 Bierton Road;
- A413 Buckingham Road / A4157 Weedon Road;
- A41 Friarage Road / A418 Oxford Road;
- A41 Bicester Road / A4157 Haydon Road;
- A418 Oxford Road Road / Churchill Ave / Fowler Road;
- A41 / Griffin Lane;
- A4010 New Road / A4129 Longwick Road;
- A418 Oxford Road / Ellen Road;
- A418 Oxford Road / Coldharbour Way;
- A41 / Broadfields;
- A41 / Meadowcroft;
- A41 / Rabans Lane;
- A41 / Jackson Road / Dickins Way;
- A41 / Aylesbury Way Parkway; and
- A4129 Thame Rd, between the A418 and Princes Risborough (A4010).

- 3.7.4 Details of the survey data are included in SES3 and AP4 ES, Volume 5: Appendix TR-001-000.

Environmental baseline

Existing baseline

- 3.7.5 The existing baseline for traffic and transport is as set out in Volume 2, CFA11, Section 12 of the main ES, updated by the additional traffic surveys.

Future baseline

Construction

- 3.7.6 The future baseline for construction is as reported in Volume 2, CFA 11, Section 12 of the main ES, updated by the additional traffic surveys.

Operation (2026 and 2041)

- 3.7.7 The future baseline for operation is as reported in Volume 2, CFA₁₁, Section 12 of the main ES, updated by the additional traffic surveys.

Effects arising during construction

Avoidance and mitigation measures

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

Assessment of impacts and effects

Temporary effects

- 3.7.9 The supplementary traffic data has the potential to change the assessment of the impacts of HS₂ construction traffic on the local network in relation to congestion and delays to vehicle users and to traffic related severance for non-motorised users.
- 3.7.10 The revised assessment has identified new or different likely significant effects in relation to congestion and delays to vehicle users at the following junctions:
- A₄₁₅₇ Elmhust Road / A₄₁₈ Bierton Road: a new moderate adverse significant effect (not significant in the SES scheme assessment);
 - A₄₁₃ Buckingham Road / A₄₁₅₇ Weedon Road: a new moderate adverse significant effect (not significant in the SES scheme assessment);
 - A₄₀₁₀ New Road / A₄₁₂₉ Longwick Road: a new major adverse significant effect (not significant in the SES scheme assessment);
 - A₄₁ Friarage Road / A₄₁₈ Oxford Road: a moderate adverse significant effect (a minor adverse significant effect reported in Part 1 of the SES and AP₂ ES);
 - A₄₁ Bicester Road / A₄₁₅₇ Haydon Road: a moderate adverse significant effect (a minor adverse significant effect reported in Part 1 of the SES and AP₂ ES);
 - A₄₁₈ Oxford Road / Churchill Ave / Fowler Road: a moderate adverse significant effect (a minor adverse significant effect reported in Part 1 of the SES and AP₂ ES);
 - A₄₁ / Griffin Lane: a moderate adverse significant effect (a minor adverse significant effect reported in Part 1 of the SES and AP₂ ES);
 - A₄₁₈ Oxford Road / Coldharbour Way: a moderate adverse significant effect (a minor adverse significant effect reported in Part 1 of the SES and AP₂ ES); and
 - A₄₁ / Jackson Road / Dickins Way: a moderate adverse significant effect (a minor adverse significant effect reported in Part 1 of the SES and AP₂ ES).
- 3.7.11 The revised assessment has also identified the removal of significant effects in relation to congestion and delays to vehicle users at the following junctions:
- A₄₁₈ Oxford Road / Ellen Road: the removal of the minor adverse significant effect reported in Part 1 of the SES and AP₂ ES;

- A₄₁ / Broadfields: the removal of the minor adverse significant effect reported in Part 1 of the SES and AP₂ ES;
- A₄₁ / Meadowcroft: the removal of the minor adverse significant effect reported in Part 1 of the SES and AP₂ ES; and
- A₄₁ / Aylesbury Way Parkway: the removal of the minor adverse significant effect reported in Part 1 of the SES and AP₂ ES.

3.7.12 The revised assessment has identified one new major adverse significant effect in relation to traffic related severance for non-motorised users on the A₄₁₂₉ Thame Rd, between the A₄₁₈ and Princes Risborough (A₄₀₁₀). This section of road has not previously been assessed.

Permanent effects

3.7.13 Permanent effects of construction on traffic and transport are reported under 'Effects arising from operation'.

Other mitigation measures

3.7.14 No changes to mitigation measures reported in Volume 2, CFA₁₁, Section 12 of the main ES are proposed.

Cumulative effects

3.7.15 The above assessment has taken into account cumulative effects, including planned developments by taking account of background traffic growth, as well as traffic and transport impacts of works being undertaken in neighbouring areas.

3.7.16 The assessment has also taken into account the cumulative impact of the SES₃ scheme and any relevant AP₂ amendments.

Summary of likely residual effects

3.7.17 The revised assessment identifies new moderate residual adverse significant effects at the A₄₁₅₇ Elmhurst Road junction with the A₄₁₈ Bierton Road and the A₄₁₃ Buckingham Road junction with the A₄₁₅₇ Weedon Road junctions, and a new major residual adverse significant effect at the A₄₀₁₀ New Road junction with the A₄₁₂₉ Longwick Road junction, in relation to junction congestion and delay to vehicle users.

3.7.18 It also identifies the removal of the residual adverse significant effects at the junctions of the A₄₁₈ Oxford Road with Ellen Road, the A₄₁ with Broadfields, the A₄₁ with Meadowcroft and the A₄₁ with Aylesbury Way Parkway junctions (all minor adverse significant effects assessed in the SES scheme).

3.7.19 In addition, the revised assessment identifies a change in significant effect, in comparison to those reported in Part 1 of the SES and AP₂ ES, at the A₄₁ Friarage Road with the A₄₁₈ Oxford Road (change from minor to moderate residual adverse significant effect), the A₄₁ Bicester Road with the A₄₁₅₇ Haydon Road (change from minor to moderate residual adverse significant effect), the A₄₁₈ Oxford Road with Churchill Ave / Fowler Road (change from minor to moderate residual adverse significant effect), the A₄₁ with Griffin Lane (change from minor to moderate residual adverse significant effect), the A₄₁₈ Oxford Road with Coldharbour Way (change from

minor to moderate residual adverse significant effect), and the A₄₁ / Jackson Road / Dickins Way (change from minor to moderate residual adverse significant effect) junctions.

- 3.7.20 The revised assessment also identifies a new major residual adverse significant effect at the A₄₁₂₉ Thame Rd, between the A₄₁₈ and Princes Risborough (A₄₀₁₀), in relation to traffic related severance for non-motorised users.
- 3.7.21 The significant effects that result from construction of the SES₃ scheme are shown on map TR-03-055 in the SES₃ and AP₄ ES, Volume 5: Traffic and Transport Map Book.

Effects arising from operation

- 3.7.22 There are no new or different significant operation effects for traffic and transport as a result of the SES₃ assessment, in comparison with the main ES and SES and AP₂ ES.

Part 2: Additional Provision 4 Environmental Statement

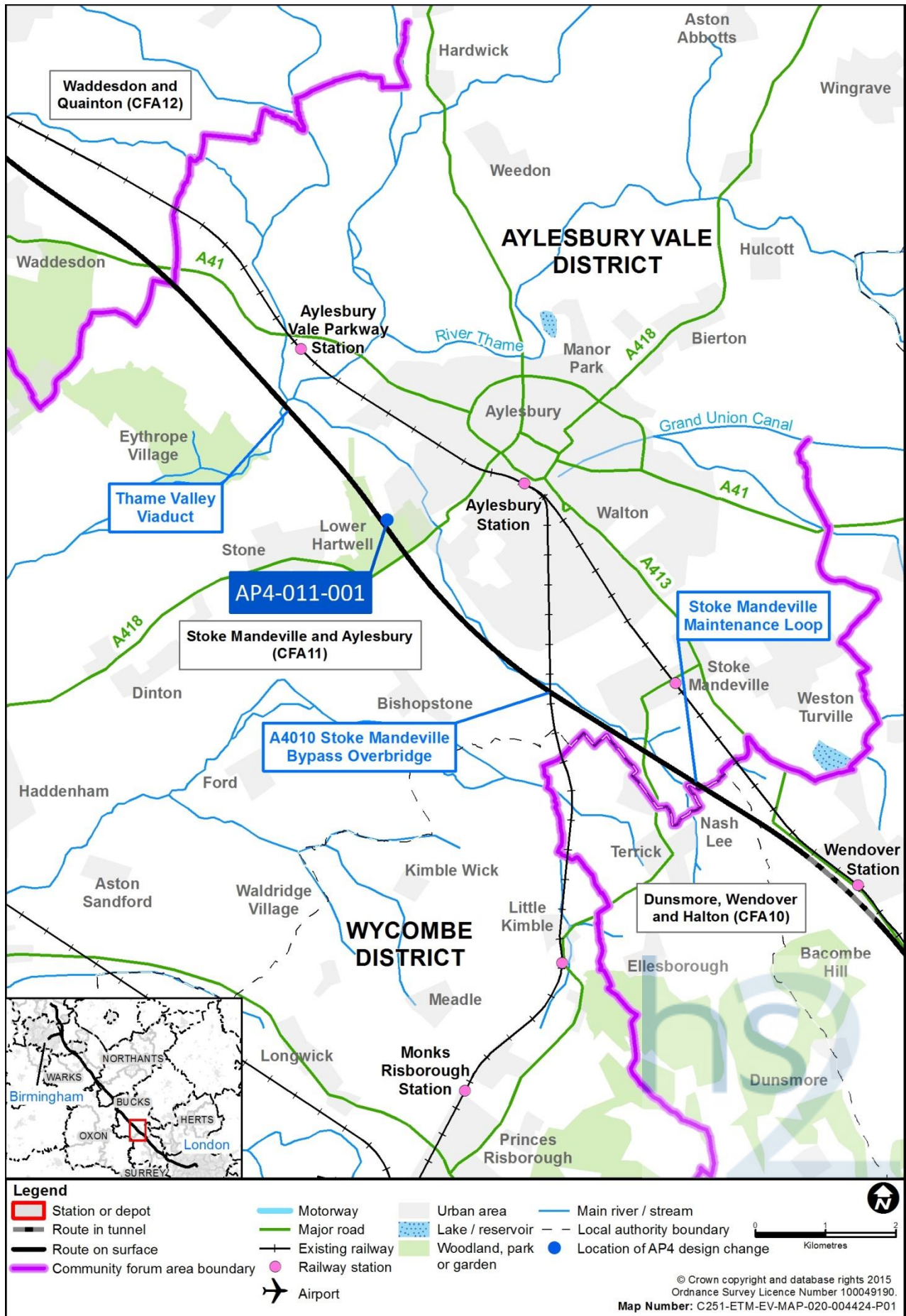
4 Summary of amendments

- 4.1.1 Table 4 provides a summary of the amendment in the Stoke Mandeville and Aylesbury community forum area (CFA11) and Figure 2 shows the location.

Table 4: Summary of amendments in CFA11

Name of amendment	Description of the SES ₃ scheme	Description of the AP ₄ revised scheme
Relocation of Footpath overbridge SBH/32 in Lower Hartwell (AP ₄ -011-001)	The Bill provides for a permanent overbridge west of Aylesbury Park Golf Club, approximately 12m above existing ground level, providing a reinstatement of Footpath SBH/32 on its current alignment.	The overbridge will be moved permanently by approximately 70m northwards in order to avoid the removal of existing vegetation and trees at Rifle Spinney. The vegetation and trees will also screen the newly positioned overbridge. An additional balancing pond is proposed. One replacement floodplain storage will be increased in size by approximately 0.1ha and a new replacement floodplain storage of approximately 0.2ha is proposed on the east of the HS2 route.

Figure 2: Locations of amendments in CFA11



5 Assessment of amendments

5.1 Relocation of Footpath overbridge SBH/32 in Lower Hartwell (AP4-011-001)

- 5.1.1 The Bill provides for a permanent overbridge west of Aylesbury Park Golf Club, approximately 12m above existing ground level, providing a reinstatement of Footpath SBH/32, which would otherwise be severed by the HS2 route (refer to maps CT-05-044 and CT-06-044 in the main ES Volume 2, CFA11 Map Book). Earthworks would be provided on the overbridge approaches to integrate the structure into the landscape. The approaches to the overbridge would be planted. Construction of the earthworks on the west of the HS2 route would require culverting of a ditch crossed by the footpath, for a length of approximately 45m. A permanent balancing pond would be provided for railway drainage north of Footpath SBH/32, to the east of the HS2 route, with access for maintenance from the existing access road to Aylesbury Park Golf Club. A replacement floodplain storage area would be provided to the east of the HS2 route, to the north of Footpath SBH/32, which would be excavated to approximately 1m below existing ground level and re-graded. Two replacement floodplain storage areas would be provided to the west of the HS2 route, to the north of Footpath SBH/32, which would be excavated to approximately 1m below existing ground level and re-graded. To the south of the overbridge and west of the HS2 route an area of landscape planting would be provided to screen the railway and integrate the railway track and overhead line equipment into the wider landscape.
- 5.1.2 Since submission of the Bill, the design has been refined: the overbridge will be moved permanently by up to approximately 70m northwards in order to avoid the removal of existing vegetation and trees of Rifle Spinney. The vegetation and trees will also screen the newly positioned overbridge. The length of the proposed diversion of Footpath SBH/32 is increased to approximately 500m, which is approximately 40m longer than in the original scheme (refer to maps CT-05-044 and CT-06-044 in the SES3 and AP4 ES Volume 2, CFA11 Map Book). The earthworks will be relocated along with the overbridge and widened in comparison to the original scheme. The length of culvert required on the west of the HS2 route is therefore extended to approximately 80m.
- 5.1.3 An additional permanent balancing pond will be provided for railway drainage north of Footpath SBH/32, to the east of the HS2 route, with access from the existing access road to Aylesbury Park Golf Club. The proposed floodplain storage area on the west of the HS2 route, nearest to the footpath overbridge will be increased in area from approximately 0.2ha to 0.3ha. An additional floodplain storage area of approximately 0.2ha will be constructed to the east of the HS2 route, between the current location of Footpath SBH/32 and the proposed location of the footpath overbridge.
- 5.1.4 The estimated duration of construction of the overbridge and landscape earthworks is three months.
- 5.1.5 Approximately 0.4ha of land on the current alignment of Footpath SBH/32 required temporarily during construction of the original scheme will no longer be required. Approximately 0.6ha of additional land, outside the original limits of the Bill, is required temporarily to construct the amendment: along the re-aligned route of Footpath SBH/32 and where the floodplain storage area will be modified, west of the

HS2 route. Approximately 1.0ha of land on the current alignment of Footpath SBH/32 required permanently in the original scheme will no longer be required. Approximately 1.8ha of additional land, outside the original limits of the Bill, is required permanently to construct the amendment.

- 5.1.6 Relocation of the overbridge and associated changes to earthworks and drainage are not considered to make changes that require a reassessment of the environmental effects or proposed mitigation as set out in the main ES with respect to: agriculture, forestry and soils; air quality; community; ecology; land quality; socio-economics; sound, noise and vibration; and traffic and transport. However, reassessment was considered to be required in respect of: cultural heritage; landscape and visual assessment; and water resources and flood risk assessment.

Cultural heritage

Introduction

- 5.1.7 This section of the report describes the environmental baseline in relation to cultural heritage that is relevant to the assessment. It then identifies any new or different likely significant environmental effects as a result of the amendment, compared to those of the SES3 scheme.

Scope, assumptions and limitations

- 5.1.8 The assessment scope, key assumptions and limitations for cultural heritage are as set out Volume 1, the SMR (Volume 5: Appendix CT-001-000/1) and the SMR Addendum (Volume 5: Appendix CT-001-000/2) of the main ES.

Existing baseline

- 5.1.9 Both the additional land required for the relocated overbridge and balancing pond, and the land no longer required for the AP4 revised scheme are within Hartwell House Grade II* Registered Park and Garden (RPG), part of the Hartwell House and Parkland group (asset reference SMA050). This group has a high heritage value and along with the Grade II* RPG includes a conservation area, one Grade I listed building, four Grade II* listed buildings and 16 Grade II listed buildings.
- 5.1.10 The parkland at Hartwell has two distinct areas. The inner parkland is the more formal late 18th century landscape closer to the house. It extends north to the stream, which runs from the lake. The land required for the relocated overbridge and the balancing pond is within the later 19th century parkland, now playing fields and a golf course. An avenue of trees runs from the inner parkland through the outer parkland forming an important view corridor from Hartwell House into the parkland and beyond. This avenue is 20m to the west of the land required for the relocated overbridge.
- 5.1.11 The land required for the relocated overbridge is also partially within the Hartwell medieval settlement (asset reference SMA054). This is the location of the former medieval village at Hartwell which was cleared in the 17th century to establish the grounds of Hartwell House. Its moderate heritage value is derived from the buried archaeology it contains.
- 5.1.12 Lower Hartwell (asset reference SMA053) is located approximately 200m to the west of the land required for the relocated overbridge and balancing pond. Lower Hartwell is a hamlet of former estate houses and farmsteads, including six Grade II listed post-

medieval buildings, associated with Hartwell House. The agricultural and parkland landscape in which the hamlet sits contributes to its moderate heritage value.

Future baseline

Construction (2017)

- 5.1.13 Volume 5: Appendix CT-004-000 of the SES₃ and AP₄ ES provides details of the developments which are assumed to have been implemented by 2017, additional to those identified in the main ES and the SES and AP₂ ES.
- 5.1.14 None of the identified developments affect the assessment of the SES₃ scheme's likely construction impacts on cultural heritage.

Operation (2026)

- 5.1.15 Volume 5: Appendix CT-004-000 of the SES₃ and AP₄ ES provides details of the developments which are assumed to have been implemented by 2026, additional to those identified in the main ES and the SES and AP₂ ES.
- 5.1.16 None of the identified developments affect the assessment of the SES scheme's likely operational impacts on cultural heritage.

Effects arising during construction

- 5.1.17 The relocated overbridge and balancing pond will be moved to the north of Rifle Spinney, an existing belt of trees. Rifle Spinney combined with the avenue of trees will provide screening of the overbridge and associated earthworks from the views from Hartwell House along the avenue. This will result in a different visual impact of the scheme as more of the existing landscape will be retained, reducing the degree to which key views from Hartwell House will be altered. However, given the AP₄ revised scheme's overall physical impact and impact on the setting of the Hartwell House and Parkland Group (asset reference SMA050) the high impact and major adverse significant effect reported in the main ES will remain unchanged.
- 5.1.18 The relocation of the overbridge and balancing pond will result in an additional 0.26ha of land being required within the Lower Hartwell medieval settlement (asset reference SMA054). The main ES reported a loss of 0.7ha of the asset resulting in a high impact with a major adverse effect, which is significant. The amendment will result in a change to the impact on the medieval settlement (asset reference SMA054) with an additional 0.26ha (6%) of the land within the asset being removed. However, this will not change the level of significance of the major adverse significant effect reported in the main ES (Volume 2, CFA11, Section 6).
- 5.1.19 The amendment will not change the impact on the setting of Lower Hartwell (asset reference SMA053) during construction when compared to the SES₃ scheme. Therefore, there is no change to the temporary medium adverse impact and significant temporary moderate adverse effect reported in the main ES.

Effects arising from operation

- 5.1.20 The amendment to relocate Footpath overbridge SBH/32 in Lower Hartwell 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.

Mitigation and residual effects

- 5.1.21 No additional mitigation measures are required.
- 5.1.22 The relocation of the overbridge and balancing pond will give rise to a different residual significant effect, reducing the impact on key views from Hartwell House (asset reference SMA050). However, this will not change the level of significance of the major adverse significant effect reported in the main ES (Volume 2, CFA11, Section 6).
- 5.1.23 The amendment will result in a different impact on the Lower Hartwell medieval settlement (asset reference SMA054) with an additional 0.26ha (6%) of the land within the asset being removed, along with any archaeological remains. However, this will not change the level of significance of the major adverse significant effect reported in the main ES (Volume 2, CFA11, Section 6).

Cumulative effects

- 5.1.24 There are no new or different likely significant cumulative effects for cultural heritage as a result of the AP4 amendments interacting with one another, the AP1 amendments, AP2 amendments, or any relevant committed development.

Landscape and visual assessment

Introduction

- 5.1.25 This section of the report describes the environmental baseline in relation to landscape and visual that is relevant to the assessment. It then identifies any new or different likely significant environmental effects as a result of the amendment, compared to those of the SES3 scheme. There are no AP1 or AP2 amendments that are relevant to the assessment.

Scope, assumptions and limitations

- 5.1.26 The assessment scope, key assumptions and limitations for the landscape and visual assessment are as set out in Volume 1, the SMR (Volume 5: Appendix CT-001-000/1) and the SMR Addendum (Volume 5: Appendix CT-001-000/2) of the main ES. An update to the methodology for the landscape and visual assessment is also described in Volume 1 of the AP1 ES.

Existing baseline

- 5.1.27 The area of land required for the relocation of the Footpath overbridge SBH/32 (AP4-011-001) is located within the Hartwell House and Golf Course LCA as described in the main ES (Volume 2, CFA 11, Section 9). The Settlement Aylesbury LCA is to the east of the amendment and the A418 Ridge LCA is to the west. Both are as described in the main ES (Volume 5: Appendix LV-001-011).
- 5.1.28 The grounds of Hartwell House are listed as Grade II* park/garden¹² and consequently the Hartwell House and Golf Course LCA has a high sensitivity to change.
- 5.1.29 Four viewpoints were assessed as being affected by the original scheme due to the removal of vegetation and trees, the construction of the Footpath SBH/32 overbridge

¹² English Heritage (2008), *English Heritage Register of Historic Parks and Gardens of Special Historic Interest*

and associated earthworks, and the presence of temporary material stockpiles (refer to Volume 2, CFA11, Section 9 of the main ES): Viewpoint 121.2.001: view north-east from dwellings in Upper Hartwell; Viewpoint 121.2.002: view east from dwellings in Lower Hartwell; Viewpoint 121.3.003: view north along the main tree avenue, Hartwell House; and Viewpoint 122.3.001: view south-west from PRow (Footpath SBH/32).

Future baseline

Construction (2017)

- 5.1.30 Volume 5: Appendix CT-004-000 of the SES3 and AP4 ES provides details of the developments which are assumed to have been implemented by 2017, additional to those identified in the main ES and the SES and AP2 ES.
- 5.1.31 None of the identified developments affect the assessment of the amendment's likely construction impacts on landscape character and visual amenity.

Operation (2026)

- 5.1.32 Volume 5: Appendix CT-004-000 of the SES3 and AP4 ES provides details of the developments which are assumed to have been implemented by 2026, additional to those identified in the main ES and the SES and AP2 ES.
- 5.1.33 None of the identified developments affect the assessment of the amendment's likely operational impacts on landscape character and visual amenity.

Effects arising during construction

Landscape assessment

- 5.1.34 The main ES reported a major adverse significant effect on the Hartwell House and Golf Course LCA due to the formation of cuttings up to 8m depth and embankments up to 4m height, the realignment of two PRow, loss of vegetation including part of Rifle Spinney and the Hartwell Estate historic tree avenue, the presence of material stockpiles and a reduction in tranquillity across the majority of the LCA.
- 5.1.35 The relocation of Footpath overbridge SBH/32 northwards will reduce the area of vegetation and trees to be removed to accommodate the bridge. However, because the impacts from construction plant and works will remain, the overall magnitude of change will remain high. The relocation of the overbridge will not give rise to new or different significant effects and will not change the level of significance of the effect reported in the main ES.

Visual assessment

- 5.1.36 The relocation of the Footpath SBH/32 overbridge to the north will reduce the area of vegetation and trees to be removed to accommodate the bridge. The reduction in the scale of the works will be small. The amendment will not give rise to new or different significant effects on visual receptors and will not change the level of significance of the moderate adverse significant effects reported in the main ES for Viewpoint 121.2.001: view north-east from dwellings in Upper Hartwell and Viewpoint 121.2.002: view east from dwellings in Lower Hartwell and the major adverse significant effects reported in the main ES for Viewpoint 121.3.003: view north along the main tree avenue, Hartwell House and Viewpoint 122.3.001: view south-west from PRow (Footpath SBH/32).

Effects arising during operation

Landscape assessment

- 5.1.37 The main ES reported a major adverse significant effect on the Hartwell House and Golf Course LCA in years 1 and 15 of operation, reducing to moderate adverse significant effect by year 60. These effects were due to the presence of engineered landforms in a relatively flat landscape, the introduction of overhead line equipment, regular high speed trains and noise fence barriers into historic parkland, the severance of the historic tree avenue, the severance of the Aylesbury Park Golf Course, the PRoW overbridge and crossings, and a reduction of tranquillity.
- 5.1.38 The relocation of the overbridge further to the north will retain the area of vegetation and trees previously identified for removal to accommodate the original bridge. However, this will be a small reduction in the context of the overall scheme and consequently 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.
- 5.1.39 The Settlement Aylesbury LCA and the A418 Ridge LCA were reported as non-significantly affected in the main ES. 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.

Visual assessment

- 5.1.40 The main ES reported non-significant effects in operation on Viewpoint 121.2.001: view north-east from dwellings in Upper Hartwell (minor adverse in year 1, negligible year 15 and minor beneficial year 60) and Viewpoint 121.2.002: view east from dwellings in Lower Hartwell (minor adverse winter in year 1 of operation, negligible year 15 and year 60) and beyond. The relocated overbridge will appear in a slightly different location from these receptors however this change will be small in the context of the wider scheme. The amendment will not give rise to new or different significant effects on these viewpoints and will not change the level of significance of the effects reported in the main ES.
- 5.1.41 The main ES reported non-significant effects on Viewpoint 121.3.003: view north along the main tree avenue, Hartwell House in year 1 (minor adverse) and in year 15 (minor beneficial). By year 60, this effect would become moderate beneficial and significant due to the establishment of the planting, which would improve the composition of the view of the historic landscape. The amendment will result in the retention of Rifle Spinney, which will screen the new footbridge from this viewpoint (refer to photomontage LV-01-067 in the SES₃ and AP₄ ES, Volume 2, CFA11 Map Book). Consequently, the amendment will change the significance of effect from minor adverse, not significant, to negligible, which remains not significant, in winter of year 1 of operation. As the planting becomes further established the view will become more similar to the SES₃ scheme. The amendment will not give rise to a new or different significant effect and will not change the level of significance of effects reported in the main ES.
- 5.1.42 The main ES reported major adverse significant effects in years 1, 15 and 60 of operation on Viewpoint 122.3.001: view south-west from PRoW (Footpath overbridge SBH/32) due to the introduction of the route on an embankment and the associated noise fence barriers and overhead line equipment clearly visible in the view. The

Footpath SBH/32 overbridge will also be visible from this location. The relocation of Footpath SBH/32 overbridge will reduce the area of vegetation and trees to be removed to accommodate the bridge but there will be no reduction in the visibility of the bridge from this footpath (refer to photomontage LV-01-068 in the main ES, Volume 2, CFA₁₁ Map Book). This will be a small change in relation to the scale of the SES₃ scheme and therefore the amendment will not give rise to new or different significant effects and will not change the level of significance of the effect reported in the main ES. A representative photomontage from Aylesbury Golf Course is included in the SES₃ and AP₄ ES, Volume 2, CFA₁₁ Map Book: LV-01-301. It should be noted that the photomontage is representative of the possible views assessed under Viewpoint 122.3.001 but is in a slightly different location to the viewpoint for the photomontage LV-01-068 in Volume 2, CFA₁₁ of the main ES, in order to capture the field of view required to adequately show the proposed amendment.

Mitigation and residual effects

- 5.1.43 No additional mitigation measures (i.e. in addition to those identified in the main ES and subsequent SES and AP ES reports) are required.
- 5.1.44 There will be no new or different residual significant construction or operational effects for landscape and visual amenity as a result of the amendment, in comparison with the main ES.

Cumulative effects

- 5.1.45 There are no new or different likely significant cumulative effects for landscape and visual as a result of the AP₄ amendments interacting with one another, the AP₁ amendments; AP₂ amendments or any relevant committed development.

Water resources and flood risk assessment

Introduction

- 5.1.46 This section of the report describes the environmental baseline in relation to water resources and flood risk that is relevant to the assessment. It then identifies any new or different likely significant environmental effects as a result of the amendment, compared to those of the SES₃ scheme.

Scope, assumptions and limitations

- 5.1.47 The assessment scope, key assumptions and limitations for water resources and flood risk are as set out in Volume 1, the SMR (Volume 5: Appendix CT-001-000/1) and the SMR Addendum (Volume 5: Appendix CT-001-000/2) of the main ES.
- 5.1.48 The assessment reviews the potential impact of the permanent relocation of the overbridge providing the diversion of Footpath SBH/32 and the new earthworks on groundwater, surface water and flood risk.

Existing baseline

- 5.1.49 The baseline water resources and flood risk information for the Stoke Mandeville and Aylesbury area is described in the main ES (Volume 2, CFA Report 11, Section 13).
- 5.1.50 The embankments of the overbridge will cross an unnamed ditch. The Hartwell Ditch and Lower Hartwell Ditch, both classified as Main Rivers, are also located in the

vicinity of the overbridge. Hartwell Ditch drains Hartwell House Lake. These drains and watercourses are not classified under the Water Framework Directive (WFD) so they have been assessed as having the same status as the downstream Stoke Brook at Aylesbury (WFD water body reference GB106039030320). It is therefore assumed that these drains have a current overall status of Moderate, with an objective of Good status by 2027.

- 5.1.51 This site is underlain by the Kimmeridge Clay Formation, classified as unproductive strata, overlain by Alluvium superficial deposits, with Head deposits present approximately 100m to the south-west. The superficial deposits are likely to be in hydraulic connectivity with the local watercourses and are likely to contain some groundwater. The Alluvium and Head superficial deposits are classified as Secondary A and Secondary (undifferentiated) aquifers, respectively.
- 5.1.52 According to Environment Agency records, there are no licensed surface water or groundwater abstractions in the area. There are no reported private, unlicensed surface water or groundwater abstractions in this area. There is the potential for further unlicensed abstractions to exist, as a licence is not required for abstraction volumes below 20m³ per day.
- 5.1.53 According to Environment Agency records, there are three current consented surface water discharges within 1km of the amendment. All consents are associated with sewerage discharges (for further information, see Volume 5: Appendix WR-002-011 of the main ES).
- 5.1.54 The main environmental features of relevance to flood risk are the Hartwell Ditch and Lower Hartwell Ditch, which are Main Rivers, close to Lower Hartwell, with the key environmental issues including:
- the need to divert a section of watercourse to the east of the proposed new footbridge due to the landscape earthworks;
 - increased length of proposed culverting;
 - potential impacts on river flooding from the Hartwell Ditch and the Lower Hartwell Ditch due to the introduction of built volume within the historical floodplain; and
 - potential impacts on the risk of surface water flooding due to increased ground slopes and loss of surface water storage.
- 5.1.55 The amended footbridge location and earthworks are located between the Hartwell Ditch and the Lower Hartwell Ditch, both of which are designated as Main Rivers, and form part of a system of land drainage ditches in Aylesbury Park Golf Club. The catchment is approximately 1km. Flood Zone 3¹³ is shown to remain in channel. Flood Zone 2, however, extends outside of the channel and across the area of the proposed new footbridge. In this area, Flood Zone 2¹⁴ has been delineated using the approximate extents of historical flooding that was recorded in 1947.

¹³ Flood Zone 3 is defined as land assessed as having a 1 in 100 or greater annual probability of river flooding in any year (High probability).

¹⁴ Flood Zone 2 is defined as land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding in any year (Medium probability).

- 5.1.56 According to the Environment Agency updated Flood Map for Surface Water, areas immediately to the north of the amendment are at a high risk of surface water flooding, with areas at risk for rainfall events up to and including the 1 in 30 years (3.3% annual probability) return period rainfall event around the northern channel of the Lower Hartwell ditch.
- 5.1.57 The Buckinghamshire Preliminary Flood Risk Assessment shows that there are areas susceptible to groundwater flooding associated with local superficial deposits at the Aylesbury Park Golf Club. Since works are above ground in this area, the risk of groundwater flooding is unlikely to be permanently affected. However, the potential for high groundwater levels is likely to exacerbate the existing flood risks arising from rivers and surface water outlined above.
- 5.1.58 Within the spatial scope of the study area, the following receptors share a common flood pathway (risk from Hartwell Ditch, Lower Hartwell Ditches and surface water flooding) with the scheme in the location of the amendment:
- Aylesbury Park Golf Club (water compatible, low value receptor);
 - Aylesbury Park Golf Club buildings (less vulnerable, moderate value receptor) (110m downstream of amendment extent) (Flood Zone 2, surface water during 1 in 30 year rainfall event);
 - Lower Hartwell Farm agricultural land (less vulnerable, moderate value receptor) (Flood Zone 2, surface Water during 1 in 30 year rainfall event); and
 - Lower Hartwell Farm area residential properties (more vulnerable, high value receptors) (190m upstream of amendment extent) (Flood Zone 2, surface water during 1 in 30 year rainfall event).
- 5.1.59 In addition, residential areas in Upper Hartwell and Aylesbury share flood risk pathways with the amendment.

Future baseline

Construction (2017)

- 5.1.60 All committed developments are required to comply with the National Planning Policy Framework (NPPF) development plans and other legislation and guidance. As such committed developments are not expected to have a material effect on the water resources and flood risk baseline. The potential change in WFD status objectives is not considered to result in the effects from the SES₃ scheme changing in significance.

Operation (2026)

- 5.1.61 For the reasons stated above for construction, the committed developments will not result in a change in significance of the effects from operation.

Effects arising during construction

- 5.1.62 Potential temporary impacts on surface watercourses were highlighted in the main ES (Volume 2, CFA Report 11, Section 13). During the construction of the overbridge, the potential temporary impacts comprised sediment mobilisation or spills which could affect downstream water quality. These potential temporary impacts will also apply to the AP₄ revised scheme, where additional works, such as watercourse diversion or

culverting, will be required at the unnamed ditch. Any measurable change in water quality would be temporary and would not affect the integrity of the ditch. Therefore the impact without mitigation on this moderate value receptor is assessed to be minor with slight adverse effect, which is not significant.

- 5.1.63 The two areas of proposed landscape earthworks either side of the HS2 route have the potential to affect larger sections of the Hartwell Ditches. Longer channel diversions may be required along the western side of the overbridge embankment. Since these watercourses are likely to be maintained artificial channels, channel diversions will not impact on the integrity of the watercourses. The impact of the diversions on these moderate value receptors without mitigation is assessed to be minor with slight adverse effect, which is not significant.
- 5.1.64 The footpath overbridge would also result in the extension of the permanent Hartwell Ditch culvert from 30m to 80m, which will require works in and over the watercourse during construction. An additional culvert is also proposed parallel to the route beneath the relocated western approach embankment. The longer and new culverts have the potential to reduce the surface water ecological quality (but will not impact on WFD status). Therefore, without mitigation, the impact on these moderate value receptors is assessed to be moderate with moderate adverse effect, which is significant.
- 5.1.65 Areas of temporary stockpile are shown within Flood Zone 2 at the location of the amendment. In accordance with Section 16 of the CoCP, excavated material storage will be located outside of areas at risk of flooding where practicable to avoid having an impact on the risk of flooding elsewhere. Where this is not possible, there will be a site specific flood risk management plan prepared prior to construction to manage the potential risks such that there will be no impact on the risk of flooding elsewhere as a result of construction of the amendment.
- 5.1.66 The amendment results in the relocation of the Footpath SBH/32 overbridge from south of the extent of Flood Zone 2 to within the extent. Although the hydraulic model of the Upper Thame catchment shows the full flow in the Hartwell and Lower Hartwell ditches to be contained within channel up to and including the 1 in 1,000 years return period (0.1% annual probability) flow, the study area is at the upstream boundary of the model, and historical information suggests that the area between the two channels is susceptible to flooding. A significant amount of land raising is proposed within Flood Zone 2 to form the approach embankments to the overbridge, which could result in the displacement of floodwater onto neighbouring land, and hence an increased risk of flooding local receptors. There is potential to have an adverse effect on the risk of flooding on the Aylesbury Park Golf Course (low value receptor), arable farmland on the western side of the route (moderate value receptor) and Lower Hartwell village (high value receptor) due to displacement of flood flows. Without mitigation, there would be a potential significant permanent adverse effect on the risk of flooding due to a loss of floodplain storage arising from the AP₄ revised scheme in comparison to the SES₃ scheme.
- 5.1.67 Due to the proposed areas of land raising associated with the landscape mitigation bunds and the overbridge approach embankments, there will be an increase in topographic gradients which could result in increased rates of surface water runoff, both into the local watercourses and to the areas of surface water risk immediately

north of the proposed overbridge. Embankments are assumed to be of porous construction; however, the percentage runoff is likely to increase, and the time of concentration is likely to reduce as a result of the significant areas with higher gradients proposed. As a result, the risk of flooding downstream of the amendment, both from the Lower Hartwell Ditch and the Hartwell Ditch and surface water, could be increased at the Aylesbury Park Golf Course (low value receptor) and Golf club buildings (moderate value receptor), as well as potential impacts on the risk of flooding to the arable farmland on the western side of the route (moderate value receptor). Without mitigation, there would be a potential significant permanent adverse effect on the risk of flooding due to an increase in surface water runoff rates arising from the AP4 revised scheme in comparison to the SES3 scheme.

Effects arising from operation

- 5.1.68 The proposed location of the new overbridge will not give rise to a new or different significant effect during operation and will not change the level of significance of the effects reported in the main ES.

Mitigation and residual effects

- 5.1.69 The approach to mitigation to be applied across the AP4 revised scheme, including this amendment, is set out in Volume 1, Section 9 and in Volume 5, Appendix WR-001-000 of the main ES. Design measures will be implemented to avoid significant adverse effects on the quality and flow characteristics of surface watercourses, groundwater bodies and flood risk.
- 5.1.70 The draft CoCP sets out the measures and standards of work that will be applied to the construction of the AP4 revised scheme (see the main ES, Volume 5, Appendix CT-003-000). These will provide effective management and control of the impacts during the construction period.
- 5.1.71 Consideration will be given in the design of the channel diversions and culverts to the objectives of the WFD as described in the River Basin Management Plan. The design mitigation including consideration of design features aligned with the objectives of the WFD (for example use of soft engineering solutions, aquatic marginal planting and the inclusion of natural forms) will ensure that the channels and structures are sufficiently sized to avoid a permanent impact on flow.
- 5.1.72 An additional balancing pond will be constructed adjacent to the Hartwell Ditch. A replacement floodplain storage area will be constructed adjacent to the Lower Hartwell Ditch. Cut-off drains will be laid at the base of the embankments to limit the flow of surface water to surrounding land. With the provision of these land drainage measures, there will be no new or different significant residual effects as a result of the amendment in comparison with the SES3 scheme.
- 5.1.73 Subject to inclusion of sufficient mitigation, the amendment will result in no change in the likely residual significant effects reported in the main ES.

Cumulative effects

- 5.1.74 There are no new or different likely significant cumulative effects for water resources or flood risk, as a result of the AP4 amendments interacting with one another, the AP1 amendments, AP2 amendments or any relevant committed development

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

- 5.1.75 The amendment to relocate Footpath overbridge SBH/32 in Lower Hartwell will give rise to different residual significant effects on cultural heritage. The impact on important views within Hartwell House and Parkland (asset reference SMA050) will lessen however the major adverse significant effect reported in the main ES will remain. There will also be a different effect arising from the potential removal of additional archaeological remains associated with the Lower Hartwell medieval settlement (asset reference SMA054). However, this does not change the level of significance of the major adverse significant effects reported in the main ES for this receptor.

6 Combined effects of amendments in this CFA due to changes in traffic flows

- 6.1.1 All of the effects of the changes proposed in this CFA have been described above and there are no further combined effects to report.

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