

HIGH SPEED RAIL (LONDON - WEST MIDLANDS)

Supplementary Environmental Statement and Additional Provision 2 Environmental Statement

Volume 2 | Community forum area report

CFA13 | Calvert, Steeple Claydon, Twyford and Chetwode

July 2015

SES and AP2 ES 3.2.1.13



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

The Supplementary Environmental Statement (SES) and Additional Provision 2 Environmental Statement (AP2 ES) comprises:

- non-technical summary (NTS). This provides a summary in non-technical language of the SES (Part 1) and AP2 ES (Part 2) and any likely significant environmental effects, both beneficial and adverse, which are new or different to those reported in the High Speed Two (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') and, where relevant, the AP ES submitted in September 2014 (hereafter referred to as 'the AP1 ES');
- Volume 1: introduction to the SES and the AP2 ES. This introduces the supplementary environmental information and design changes included within the SES and amendments which have resulted in the need to amend the Bill within the AP2 ES. It also explains any changes to the scope, methodology, assumptions and limitations required for the environmental impact assessment;
- Volume 2: community forum area (CFA) reports and map books. These describe the supplementary environmental information and design changes included within the SES (Part 1), amendments within the AP2 ES (Part 2) and report any new or different likely significant environmental effects arising from these changes in each CFA compared to those reported in the main ES and, where relevant, the AP1 ES. The main local alternatives that have been considered are described, where relevant;
- Volume 3: route-wide effects. This describes new or different likely significant route-wide effects arising from the supplementary environmental information included within the SES (Part 1) and amendments within the AP2 ES (Part 2) compared to those reported in the main ES and AP1 ES;
- Volume 4: off-route effects. This reports new or different likely significant off-route effects arising from the amendments within the AP2 ES compared to those reported in the main ES and, where relevant, the AP1 ES;
- Volume 5: Appendices and map books. This contains supporting environmental information and associated maps; and
- glossary of terms and list of abbreviations. This contains any new or different

terms and abbreviations used throughout the SES and AP2 ES compared to those included in the main ES and AP1 ES.

Structure of this report

This volume of the SES and AP2 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 European Protected Species surveys, additional cultural heritage and ecology data relating to ancient woodlands and geophysical and walk-over surveys for cultural heritage undertaken since the submission of the Bill;
- changes to the design or construction assumptions which do not require a change to the Bill; and
- corrections to the main ES.

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 SES assessment;
 - changes of relevance to the assessment;
 - environmental baseline;
 - effects arising during construction;
 - effects arising from operation; and
 - mitigation and residual effects; and
- 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 AP2 ES assessment;
 - environmental baseline;

- effects arising during construction;
- effects arising from operation; and
- mitigation and residual effects; and
- 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). The Bill and associated Additional Provisions to the Bill, if enacted by Parliament, will provide the powers to construct, operate and maintain Phase One of HS2.
- 1.1.2 Since the submission of the main ES and AP1 ES, a number of changes to environmental information and 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 SES (Part 1) or AP2 ES (Part 2) of this document.
- 1.1.3 The SES contains updated environmental baseline information and scheme information relating to changes that have occurred within the current limits and powers of the Bill, and therefore do not require an Additional Provision to the Bill. This includes:
- additional environmental baseline information;
 - changes to the design or construction assumptions which do not require changes to the Bill; and
 - corrections to the main ES.
- 1.1.4 Design changes described within the SES relate to improvements to the surface water drainage at the Infrastructure Maintenance Depot (IMD).
- 1.1.5 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.
- 1.1.6 The purpose of the SES is to provide an assessment of any new or different likely significant environmental effects arising from the changes described.
- 1.1.7 The AP2 ES reports 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 Additional Provision to the Bill.
- 1.1.8 The amendments assessed within AP2 ES include:
- access arrangements, e.g. amendments to the locations, alignments and/or width of some access tracks proposed by the original scheme;
 - roads and Public Rights of Way (PRoW): changes to the locations of temporary diversions or permanent realignments; and
 - revised locations for mitigations measures.
- 1.1.9 The AP2 ES assesses each amendment separately for all relevant topics. The purpose of the AP2 ES is to provide an assessment of any new or different likely significant environmental effects arising from the amendments.

- 1.1.10 The standard measures that will be used to mitigate likely significant adverse environmental effects during HS2's construction and operation 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 SES and AP2 ES.
- 1.1.11 It should be noted that, since submission of the Bill, the scheme design has been revised by SES design changes, amendments described in the AP1 ES (AP1 amendments) and/or amendments described in the AP2 ES (AP2 amendments).
- 1.1.12 In order to differentiate between the original proposals and subsequent changes, the following terms are used:
- 'the original scheme' - the Bill scheme submitted to Parliament in November 2013, which was assessed in the main ES;
 - 'the AP1 revised scheme' - the original scheme as amended by the AP1 submitted in September 2014;
 - 'the SES scheme' - the original scheme with the design changes described in the SES; and
 - 'the AP2 revised scheme' - the original scheme as amended by the SES scheme and AP2.

Part 1: Supplementary Environmental Statement

2 Summary of changes

2.1 New environmental baseline information

Cultural heritage

- 2.1.1 Geophysical surveys have been undertaken in the Calvert, Steeple Claydon, Twyford and Chetwode area (CFA13) since production of the main ES (September 2013). A review of the ancient woodland inventory published by Natural England in 2014 has been carried out to identify woodlands that have been added to the inventory since submission of the main ES.
- 2.1.2 Details of survey and desk-study undertaken in this CFA since September 2013 is provided in SES and AP2 ES Volume 5, Map Series CH-01; where this is relevant to the assessment of a new or different significant effect.
- 2.1.3 Details of supplementary cultural heritage information from these sources that is relevant to the SES assessment are provided in Section 3.1 under 'Cultural heritage'.

Ecology

- 2.1.4 Surveys for bats, great crested newt, otter and white-clawed crayfish have been undertaken in this area since September 2013. In relation to bats this has included additional trapping, radio tracking and thermal imaging surveys of bat populations in the Bernwood Forest area. A review of the updated ancient woodland inventory has been undertaken to identify woodlands that have been formally added since submission of the main ES. In addition, habitat survey has been undertaken at selected other woodland locations to assist in determining if these areas represent ancient woodland.
- 2.1.5 Additional butterfly records for black hairstreak, brown hairstreak and purple emperor have also been obtained, but the invertebrate assemblage in CFA13 remains of regional value as reported in the main ES.
- 2.1.6 Details of all survey work and desk-study information gathered since September 2013 which is relevant to this area is provided in SES and AP2 ES Volume 5: Appendix EC-001-002 (Baseline data appendix) and Volume 5, Map Series EC-01, EC-04; EC-05; EC-06 and EC-11.
- 2.1.7 Further detail of supplementary ecological information that is relevant to the SES assessment is included within Section 3.2 under 'Ecology'. This includes details of all changes relating to the status of ancient woodland.
- 2.1.8 SES and AP2 ES Volume 5: Appendix EC-003-002 provides a summary of additional baseline survey data collected since September 2013, which has resulted in no change to the conclusions of the main ES. SES and AP2 ES Volume 5: Appendix EC-002-002 identifies additional local/parish level effects which occur as a consequence of SES changes but are not significant.

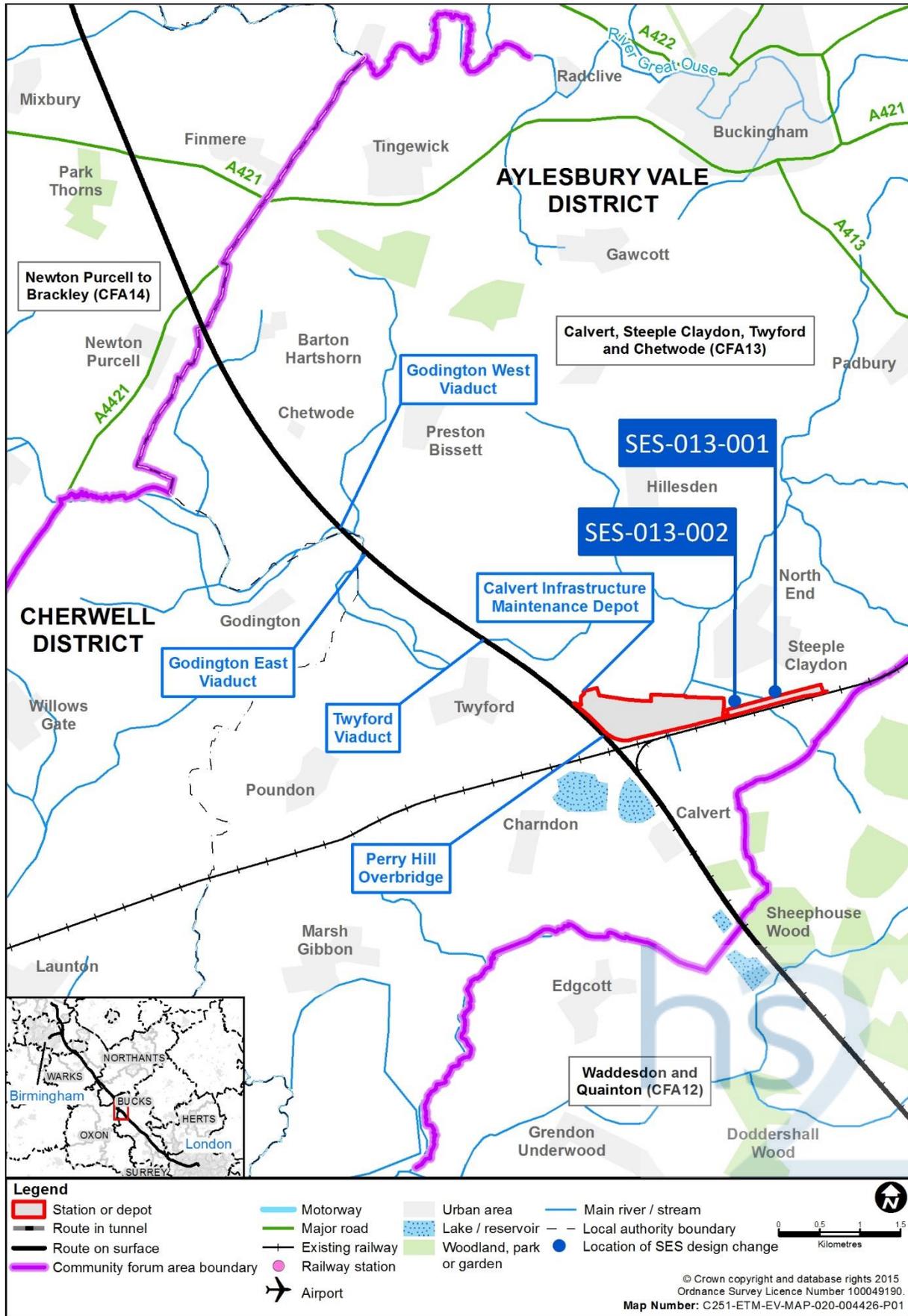
2.2 Changes to the design or construction assumptions not requiring a change to the Bill

- 2.2.1 Table 1 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 Calvert, Steeple Claydon, Twyford and Chetwode CFA (CFA13). Figure 1 shows the locations.

Table 1: Summary of changes to the design or construction assumptions not requiring a change to the Bill in CFA13

Name of design change or construction assumption	Description of the original scheme	Description of the SES scheme
<p>Additional pond and access road 750m east of Addison Road for the infrastructure maintenance depot.</p> <p>SES-013-001</p>	<p>The original scheme provides for drainage of the IMD as a single area with one culvert that will discharge to a pond west of the depot.</p>	<p>The drainage of the IMD will be divided into three areas. The eastern part of the depot will drain to a new pond 750m east of Addison Road. The new pond will be in addition to the pond and culvert proposed in the original scheme. A maintenance access road will be provided.</p>
<p>Additional pond immediately east of Addison Road for the infrastructure maintenance depot.</p> <p>SES-013-002</p>	<p>The original scheme provides for drainage of the IMD as a single area with one culvert that will discharge to a pond west of the depot.</p>	<p>The drainage of the IMD will be divided into three areas. The middle part of the depot will drain to a new pond adjacent to Addison Road. The new pond will be in addition to the pond and culvert proposed in the original scheme. A maintenance access road will be provided.</p>

Figure 1: Locations of design changes not requiring a change to the Bill in CFA13



Description of changes to the design or construction assumptions

Infrastructure Maintenance Depot

- 2.2.2 The IMD will be located between Calvert and Steeple Claydon. The Bill provides for drainage of the IMD with a single drainage system serving the whole depot. One new culvert the full length of the depot would have discharged surface water to a pond west of the depot.
- 2.2.3 Since submission of the Bill, it has been concluded that there is a likelihood that the proposed culvert would interfere with existing drainage running north-south across the depot.
- 2.2.4 The SES scheme will divide drainage of the IMD into three areas:
- the western part of the depot will still drain to the pond proposed in the original scheme - its size will not change compared to the original size;
 - the eastern part of the depot is addressed under 'Additional pond and access road 750m east of Addison Road for the Infrastructure Maintenance Depot (SES-013-001); and
 - the central part of the depot is addressed under 'Additional pond immediately east of Addison Road for the Infrastructure Maintenance Depot' (SES-013-002).

Additional pond and access road 750m east of Addison Road for the Infrastructure Maintenance Depot (SES-013-001)

- 2.2.5 This SES revision concerns drainage of the eastern part of the depot. Here, surface water drainage will be discharged to a new pond 750m east of the Addison Road and north of proposed landscape earthworks. A maintenance access road will be required between the IMD and the proposed drainage area; the access road will cross the IMD landscape earthworks.
- 2.2.6 The estimated duration of construction of the pond and access road is one month, though the duration for construction of the IMD culvert will remain at six months, which is the same as the original scheme. The design change is within the existing limits of the Bill.
- 2.2.7 The pond and access road 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 any environmental topic.

Additional pond immediately east of Addison Road for the Infrastructure Maintenance Depot (SES-013-002)

- 2.2.8 This SES revision concerns drainage of the middle central part of the depot. Here, surface water drainage will be discharged to a new pond immediately east of Addison Road and north of the proposed landscape earthworks. Maintenance access to the drainage area, including a turning head¹, will be provided from Addison Road.

¹ A space where vehicles can turn around.

- 2.2.9 The estimated duration of construction of the pond and turning head is one month, though the duration for construction of the IMD culvert will remain at six months, which is the same as the original scheme. The design change is within the existing limits of the Bill.
- 2.2.10 The drainage area and access road 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 any environmental topic.

Changes to the design or construction assumptions in other CFAs affecting this CFA

- 2.2.11 Design changes in other CFAs affect CFA13, in particular the removal of the sustainable placement area at Hunt's Green in CFA10 and the reduction of landscape earthworks at Lower Boddington in CFA15. Consequently the movement of excavated material by heavy goods vehicle (HGV) will change in this CFA and traffic flows will differ in comparison to the original scheme. The assessment in relation to this is presented in Section 3.3: 'Assessment of changes' under Traffic and transport.

2.3 Corrections to the main ES

- 2.3.1 Since submission of the Bill, the need for a number of corrections in the contents of the main ES has been identified. Table 2 provides a list of those instances where there has been a need to correct the Volume 2 CFA report for CFA13 because of the potential to alter the significant environmental effects reported in the main ES or a factual inaccuracy relating to significant effects has been identified. The table gives the location of the correction in the main ES, the reason for the correction, replicates the text from the main ES, where applicable, provides revised text, and identifies whether the correction changes a significant effect reported in the main ES. Where relevant, these corrections have been taken into account in the technical assessments contained within Section 3 of this SES.

Table 2: Summary of corrections to the main ES in CFA13

Reference in the main ES	Reason for correction	Text in the main ES (references are to main ES)	Revised Text	Change to significant effects and mitigation
<p>Sound, noise and vibration</p> <p>Paragraph 11.4.19 Volume 2, CFA13, Section 11.3 of main ES.</p>	<p>The number of residential dwellings qualifying for noise insulation was stated as four. It is now known to be five because there will be two residential dwellings in a committed development at Manthorn Farm, Chetwode. In the main ES it was assumed there was only one residential dwelling in the development.</p>	<p>Taking account of the avoidance and mitigation measures incorporated into the Proposed Scheme, the assessment has identified approximately four residential dwellings, close to the Proposed Scheme, where noise would exceed the daytime trigger threshold set in the Regulations. It is therefore estimated that these buildings are likely to qualify for noise insulation under the Regulations. These dwellings are indicated on Volume 5: Map Book - Sound, noise and vibration, Map series SV-02:</p> <ul style="list-style-type: none"> – Rosehill Barns and Rosehill Farm, Chetwode receptor reference 274142 (marked as OSV13-Do1 in Table 3); – The Hermitage, Chetwode receptor reference 275251 (marked as OSV13-Do2 in Table 3); and – proposed residential property in committed development at Manthorn Farm, Chetwode (refer to Volume 2 Section 2) to be located closest to the route, receptor reference 711004 (marked as OSV13-Do3 in Table 3). 	<p>Taking account of the avoidance and mitigation measures incorporated into the Proposed Scheme, the assessment has identified five residential dwellings, close to the Proposed Scheme, where noise would exceed the daytime trigger threshold set in the Regulations. It is therefore estimated that these buildings are likely to qualify for noise insulation under the Regulations. These dwellings are indicated on Volume 5: Map Book - Sound, noise and vibration, Map series SV-02:</p> <ul style="list-style-type: none"> – Rosehill Barns and Rosehill Farm, Chetwode receptor reference 274142 (marked as OSV13-Do1 in Table 3); – The Hermitage, Chetwode receptor reference 275251 (marked as OSV13-Do2 in Table 3); and – two proposed residential properties in committed development at Manthorn Farm, Chetwode (refer to Volume, Section 2) to be located closest to the route, receptor reference 711004 (marked as OSV13-Do3 in Table 3). <p>(The predicted operational airborne sound levels at this assessment location are presented in main ES Appendix SV-004-013. This building is shown on SES and AP2 ES Map series SV-02 (Volume 5, Sound, Noise and Vibration Map Book).</p>	<p>Yes.</p> <p>One additional dwelling is identified as being subject to a significant adverse effect, and is consequently estimated to be likely to qualify for noise insulation.</p> <p>The mitigation measures, including noise insulation will reduce noise inside all dwellings such that it will not reach a level where it would significantly affect residents.</p>

Reference in the main ES	Reason for correction	Text in the main ES (references are to main ES)	Revised Text	Change to significant effects and mitigation
<p>Traffic and transport</p> <p>Paragraph 12.4.16, Volume 2, CFA13 of the main ES.</p>	<p>The peak period was used for the main ES to estimate workforce trips to systems compounds, whereas the peak hour should have been used. This has resulted in a small change in peak hour, all vehicle construction trips on a number of roads, with an assessment error for Addison Road, north of the Bicester to Bletchley Line railway, with regard to traffic-related severance² for non-motorised users.</p>	<p>Eleventh bullet:</p> <p>Addison Road, north of Bicester to Bletchley Line railway (minor adverse effect) due to increase in HGV flow as well as all traffic flow</p>	<p>Eleventh bullet:</p> <p>Addison Road, north of Bicester to Bletchley Line railway (moderate adverse effect) due to increase in HGV flow as well as all traffic flow</p>	<p>Yes</p> <p>This correction results in an adverse moderate significant residual effect on Addison Road, north of Bicester to Bletchley Line railway, with regard to traffic-related severance for non-motorised users, see Section 3.3.</p> <p>No further traffic and transport avoidance or mitigation measures during construction are required see Section 3.3.</p>

² In the context of traffic and transport, Severance is used to relate to a change in ease of non-motorised users due to, for example, a change in travel distance or travel time or a change in traffic levels on a route that makes it harder for non-motorised users to cross. A reference to severance does not imply a route is closed to access.

2.4 Topics included in the SES assessment

- 2.4.1 The changes described in Sections 2.1 to 2.3 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; land quality; landscape and visual assessment; socio-economics; sound, noise and vibration; and, water resources and flood risk assessment. However, there are changes where reassessment is considered to be required in respect of: cultural heritage; ecology and traffic and transport.

3 Assessment of changes

3.1 Cultural heritage

Introduction

- 3.1.1 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 the original scheme. Consideration is given to effects upon the value of heritage assets, including through changes to their setting, as a result of the additional changes.

Scope, assumptions and limitations

- 3.1.2 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.

Changes of relevance to this assessment

- 3.1.3 Natural England published a revision of the ancient woodland inventory in 2014, which has identified additional areas of ancient woodland in this CFA.

Environmental baseline

Existing baseline

- 3.1.4 The cultural heritage baseline for the assessment takes into account information collected in support of the main ES, which included walk-over 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 6.3 of the main ES. In addition, the baseline has been updated with the results of additional survey work comprising geophysical surveys for archaeology; and a review of the ancient woodland inventory published by Natural England to identify areas of ancient woodland that have been added since publication of the main ES.
- 3.1.5 A summary of the baseline information relevant to the assessment of new or different effects is provided below. Further details of additional baseline information obtained since the main ES is provided in Volume 5: Appendix CH-001-013 of the SES and AP2 ES. 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 Map Series CH-01, CH-02 and CH-03.

Designated assets

- 3.1.6 The following additional areas of ancient woodland have been added to the Natural England ancient woodland inventory:
- a linear area of woodland (asset reference³ CAL129) 10m south-east of

³ 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.

Decoypond Wood (asset reference CAL001); and

- two triangular woods (asset reference CAL130), 240m north-west of Decoypond Wood.

3.1.7 The linear area of ancient woodland 10m to the south-east of Decoypond Wood that has been added since the main ES was historically part of Decoypond Wood. It is of high heritage value. The construction of the London extension of the Great Central Main Line (GCML) railway (asset reference CAL004) resulted in the strip becoming divided from the rest of the woodland.

3.1.8 The two triangular areas of ancient woodland 240m north-west of Decoypond Wood were historically a single woodland. They are of high heritage value. This woodland was bisected by the construction of the London extension of the GCML railway.

Non-designated assets

3.1.9 No new non designated assets that are relevant to this assessment have been identified in this CFA.

Future baseline

Construction (2017)

3.1.10 The future baseline for construction in 2017 remains unchanged from that reported in the main ES (Volume 2, CFA13, Section 6.3).

Operation (2026)

3.1.11 The future baseline for operation in 2026 remains unchanged from that reported in the main ES (Volume 2, CFA13, Section 6.3).

Effects arising during construction

Avoidance and mitigation measures

3.1.12 Measures of avoidance and mitigation with regard to cultural heritage are provided in the draft CoCP as part of the main ES (Volume 5: Appendix CT-003-000).

Assessment of impacts and effects

Temporary effects

3.1.13 The new environmental baseline will not give rise to a new or different effect and will not change the level of significance of the effects reported in the main ES.

Permanent effects

3.1.14 The linear strip of ancient woodland 10m to the south-east of Decoypond Wood lies wholly in land required for the original scheme. This will result in the total loss (1.4ha) of the heritage asset, giving rise to a new significant effect with a high adverse impact and major adverse effect.

3.1.15 The two areas of ancient woodland 240m north-west of Decoypond Wood lie partially in an area required for the original scheme. This will result in a loss of about 0.7ha of woodland, 60% of the total woodland. The value of the asset will be substantially

altered and result in a new significant effect with high adverse impact with a major adverse effect.

Other mitigation measures

- 3.1.16 No changes to mitigation measures reported in Volume 2, CFA13 of the main ES are required.

Cumulative effects

- 3.1.17 There are no new or different likely significant cumulative effects for cultural heritage as a result of the SES changes acting in combination with the SES, or in AP1, or as a result of any relevant committed development.

Summary of likely residual significant effects

- 3.1.18 The construction of the original scheme will give rise to two new major adverse residual significant effects due to the total loss of one area of ancient woodland (asset reference CAL129) and the loss of 60% of another area of ancient woodland (asset reference CAL130), both identified in a revision of the ancient woodland inventory since publication of the main ES.

Effects arising from operation

- 3.1.19 The operation of the original scheme 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 or the AP1 ES.

Volume 5 amendments

- 3.1.20 Table 3 sets out the additions to the main ES, Volume 5: Appendix CH-002-013 (gazetteer of heritage assets). Table 4 sets out the additions to the main ES, Volume 5: Appendix CH-003-013 (impact assessment tables).

Table 3: Additions to Volume 5: Appendix CH-002-013, Cultural heritage - gazetteer of heritage assets

Unique ID	Map reference	Asset type	Name	Description	Period	Designation	Grade	Significance/ value	NHL reference	HER reference
CAL129		Ancient woodland	Linear ancient woodland 10m south-east of Decoypond Wood	<p>Ancient and semi-ancient woodland. Historically part of Decoypond Wood until the construction of the London extension to the GCML railway. A surviving remnant of more extensive forest as part of the mosaic of other surviving ancient woodland in the surrounding landscape. Its value lies in its potential for well-preserved archaeological remains of woodland management and industries typical of woodland such as wood banks, saw pits, quarries and small settlements. They can also preserve features of earlier periods</p> <p>The setting of the woodland is not a contributing factor to the value, as ancient woodland is nearly always a surviving fragment of a much larger, since lost, landscape hence the non-wooded surrounds are rarely contemporary.</p>	N/A	Ancient woodland	N/A	High	N/A	N/A
CAL130		Ancient woodland	Two triangular areas of ancient woodland 240m north-west of Decoypond	<p>Ancient and semi-ancient woodland. Historically one wood until it was bisected by the London extension of the GCML railway. Surviving remnants of more extensive forest as part of the mosaic of other surviving ancient woodland in the surrounding</p>	N/A	Ancient Woodland	N/A	High	N/A	N/A

Unique ID	Map reference	Asset type	Name	Description	Period	Designation	Grade	Significance/ value	NHL reference	HER reference
			Wood	<p>landscape. Their value lies in its potential for well-preserved archaeological remains of woodland management and industries typical of woodland such as wood banks, saw pits, quarries and small settlements. They can also preserve features of earlier periods.</p> <p>The setting of the woodland areas are not a contributing factor to the value as ancient woodland is nearly always a surviving fragment of a much larger, since lost, landscape hence the non-wooded surrounds are rarely contemporary.</p>						

Table 4: Additions to Volume 5, Appendix CH-003-013, Cultural heritage - impact assessment tables

Unique identification	Name	Designation(s)	Value	Construction impact			Operation impact			New or different environmental effect from that reported in the main ES or the Additional Provision (AP1) ES
				Nature of impact including mitigation	Scale of impact	Effect	Nature of impact including mitigation	Scale of impact	Effect	
CAL129	Linear ancient woodland 10m south-east of Decoypond Wood	Ancient woodland	High	The woodland lies wholly within the land required for the original scheme. This will result in the woodland being lost, with the loss of the asset.	High adverse	Major adverse	The construction effect remains and there will be no further impact	No change	Neutral	This is a new effect as the woodland has been identified as ancient woodland since publication of the main ES.
CAL130	Triangular areas of ancient woodland 240m north-west of Decoypond Wood	Ancient woodland	High	The woodland lies partially within the land required for the original scheme. This will result in the loss of 0.7ha, 60% of the woodland altering the value of the asset.	High Adverse	Major Adverse	The construction effect remains and there will be no further impact	No change	Neutral	This is a new effect as the woodland has been identified as ancient woodland since publication of the main ES.

3.2 Ecology

Introduction

- 3.2.1 This section of the report describes the environmental baseline in relation to ecology 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 original scheme and also compared to any relevant AP1 amendments. 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

- 3.2.2 The assessment scope for ecology is as set out in Volume 1 of the SES and AP2 ES. The key assumptions and limitations, and the methodology for determining significance of effects are as set out in Volume 1, the SMR (Volume 5: Appendix CT-001-000/01) and the SMR Addendum (Volume 5: Appendix CT-001-000/02) of the main ES.
- 3.2.3 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 SES Scheme.

Changes of relevance to this assessment

- 3.2.4 The only changes of relevance to this assessment are the new environmental baseline information relating to ancient woodland, great crested newt and bats obtained since September 2013.

Environmental baseline

Existing baseline

- 3.2.5 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 is provided in main ES Volume 2, CFA13, Section 7 and in Maps EC-01 to EC-12, (Volume 5, Ecology Map Book).
- 3.2.6 The assessment also takes into account additional desk-study and survey information collected since September 2013. Supplementary information relevant to the assessment in this CFA includes: additional survey work for great crested newt, bats, otter and ancient woodland.
- 3.2.7 The bat surveys carried out in CFA13 in 2014 were designed to confirm and supplement the baseline data from 2012/13 surveys on woodland bats in the Bernwood Forest area. Early- and late-season surveys were carried out where access permitted, particularly April and October. Automated surveys, transects, paired sampling, trapping and radio tracking surveys were carried out as in previous years. In addition, thermal imaging and infrared filming was carried out to provide detailed

information on flight behaviour along and across the HS2 route. The findings of these surveys are provided in Volume 5: Appendix EC-001-002 of the SES and AP2 ES.

3.2.8 In addition, the Water Framework Directive assessment has been updated. Details of the revised assessment are presented in Volume 5: Appendix WR-001-000.

3.2.9 A summary of the baseline information relevant to the assessment is provided below. Further details of all baseline information obtained since September 2013 is provided in the SES and AP2 ES Volume 5: Appendix EC-001-002 and in SES and AP2 ES Volume 5 Maps EC-01, EC-04 to EC-05; EC-06; and EC-11 (Volume 5, Ecology Map Book). For those receptors described in the main ES, further details are provided in Volume 2, CFA13, Section 7.3 and in Volume 5, including maps EC-01 to EC-12.

Designated sites

3.2.10 Three areas of ancient woodland (together comprising approximately 2.6ha) to the north of Sheephouse Wood Site of Special Scientific Interest (SSSI) were added to Natural England ancient woodland inventory in 2014 after the release of the main ES. They comprise 1.4ha on the opposite side of the existing railway from Decoypond Wood and two areas of unnamed woodland with a combined area of 1.2ha on either side of the HS2 route to the south of Calvert; all are within land required for the SES scheme.

3.2.11 There has been no other change to the baseline information relating to designated sites as set out in Volume 2, CFA13, Section 7.3 of the main ES.

Habitats

3.2.12 The additional areas of ancient woodland identified since the publication of the main ES are habitats of principal importance⁴ and fragments of the former Bernwood Forest. These additional areas have changed from local/parish value to county/metropolitan value. They are now considered to form part of a resource of ancient woodland in the vicinity of the HS2 route that was identified as being of county/metropolitan value in the main ES.

Protected and/or notable species

3.2.13 The main ES identified a population of Bechstein's bat associated with woodland and intervening habitat north and south of the HS2 route, as well as an assemblage of bats associated with woodland habitats (Brandt's, brown long-eared, Daubenton's and whiskered bats; which are all *Myotis* species with the exception of brown long-eared bat), between Calvert Jubilee Nature Reserve and Edgcott Road (in CFA12). It also identified the presence of populations of serotine, noctule, Leisler's, common pipistrelle, soprano pipistrelle and Nathusius' pipistrelle bats, in CFA13.

3.2.14 The values stated in the main ES are at the national level for Bechstein's bat; the regional level for the assemblage of bats associated with woodland habitat; and of county/metropolitan value for all other populations and assemblages of bats, except for Nathusius' pipistrelle and those that were identified on a precautionary basis which are of up to county/metropolitan value, and transitional roosts of common and soprano pipistrelle near Twyford which are of local/parish value.

⁴ *Natural Environment and Rural Communities Act 2006 (Chapter 16)*. London. Her Majesty's Stationery Office.

- 3.2.15 Additional surveys undertaken in 2014 have identified bat roosts and flight lines in CFA12 and CFA13 that are additional to those recorded in the main ES, see Volume 5: Appendix EC-001-002 of the SES and AP2 ES. These results do not alter the valuation of bat populations and assemblages presented in the main ES, as adequate information was available to establish the likely size and range of bat populations present. However, the updated baseline information provides further clarity on key crossing points and bat behaviour at these crossing points that are relevant to the assessment of likely significant effects of the scheme.
- 3.2.16 A total of 55 tree roosts and four building roosts were confirmed during 2014 radio-tracking surveys (in CFA12 and CFA13), these are in addition to those reported in the main ES, comprising roosts for Bechstein's, Brandt's, brown long-eared, Daubenton's, Natterer's and whiskered bat; with two Bechstein's and one brown long-eared roosts in CFA13. All of these species were recorded roosting in this area during surveys in support of the main ES. Five new maternity roosts for Bechstein's bat were identified in surveys in 2014 in CFA12 and two roosts for male Bechstein's bats were recorded in CFA13.
- 3.2.17 Additional information on the volume and patterns of activity of bats was recorded in 2014. The 2014 surveys did not identify any additional bat species and do not change the value of bat assemblages or populations reported in the main ES. However, they are relevant to the consideration of new or different significant effects. The main additional findings were as follows:
- 2014 data confirmed key crossing points of the HS2 route identified in previous surveys for Bechstein's and other *Myotis* species, but a high proportion of *Myotis* species were also recorded at School Hill and Edgcott Road overbridges, of which the former is in CFA13;
 - additional flight lines for brown long-eared bat along West Street and along Perry Hill to Calvert Jubilee Nature Reserve in CFA13; and
 - variation in bat activity relative to that recorded in previous years was recorded in the vicinity of Sheepphouse, Grendon, - Doddershall and Finemere woods, as follows:
 - lower levels of bat activity were recorded at Hewin's Wood, along Bridleway GUN/28, along the Mega Ditch⁵ and in the vicinity of Benfield's overbridge in CFA12; and
 - higher levels of bat activity including Bechstein's bat was recorded north and south Benfield's overbridge: along Edgcott Road, Grendon Junction in CFA12 and adjacent to the existing Aylesbury Link railway line between Sheepphouse Wood and Calvert Jubilee Nature Reserve in CFA13.

Future baseline

Construction (2017)

- 3.2.18 The future baseline for construction in 2017 remains unchanged from that reported in the main ES (Volume 2, CFA13, Section 7.3).

⁵ Deepened and widened diversion of the Muxwell Brook close to Sheepphouse Wood and adjacent to parts of the Bridleway GUN/25, containing scattered scrub and wetland vegetation.

Operation (2026)

- 3.2.19 The future baseline for operation in 2026 remains unchanged from that reported in the main ES (Volume 2, CFA13, Section 7.3).

Effects arising during construction

Avoidance and mitigation measures

- 3.2.20 Section 7.4 of the main ES includes avoidance and mitigation measures that are relevant to this assessment. In summary they are:

- the overbridges (all in CFA13) at Footpath SCL/13, the waste transfer siding at Calvert, School Hill, Perry Hill, West Street and School End that will provide physical structures over the railway and will limit severance between existing habitats used as flight lines by bats even though not specifically designed for this purpose;
- in CFA12 (Volume 2: CFA12 Section 3.2) overbridges at Bridleway QUA/28A, Edgcott Road, Bridleway QUA/36, Bridleway GUN/28, and Footpath QUA/26, Adam's accommodation, and Footpath CAG/2 underbridges (all within CFA12) will provide potential crossing points for commuting bats even though not specifically designed for this purpose; and
- minimising habitat loss from the Mega Ditch in CFA12, which provides a sheltered and unlit corridor for commuting and foraging bats.

- 3.2.21 The assessment assumes implementation of the measures set out in 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

- 3.2.22 The new baseline data 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

- 3.2.23 The main ES states that approximately 1.1ha of ancient woodland in CFA13 will be removed by the construction of engineering earthworks associated with the eastern bank of the Calvert cutting. The loss will be a permanent adverse effect that is significant at the county/metropolitan level. An additional 2.6ha of ancient woodland (considered in the main ES but not as ancient woodland) is known to be within or adjacent to the SES scheme on the basis of data provided in the revised ancient woodland inventory. All of the additional ancient woodland opposite Decoypond Wood (1.4ha) and approximately 64% (0.7ha) of the two areas close to Calvert will be removed, and in total approximately 83% (2.1ha) of the newly identified ancient woodland that is relevant to the SES scheme will be removed.
- 3.2.24 The main ES assessed the significance of the removal of the woodland that has since been identified as ancient woodland on the basis that it was a habitat of principal importance, but not ancient woodland. It concluded that the losses would be of

relevance at only the local/parish level. As a result of the inventory changes, the losses of these woodlands are now considered as part of the wider resource of ancient woodland within this area. The total loss of ancient woodland in this area has increased to 3.2ha, an increase of 2.1ha from that reported in the main ES. This is a different significant effect, however the effects on ancient woodland reported in the main ES, remains significant at the county/metropolitan level.

- 3.2.25 The new baseline data not will result in any other new or different effects on habitat receptors of relevance at more than the local/parish level. Additional local/parish level effects (i.e. in addition to those identified in the main ES) arising from SES changes are listed in SES and AP2 ES Volume 5: Appendix EC-002-002.

Protected and/or notable species

- 3.2.26 The main ES reports prior to mitigation, that habitat loss and fragmentation resulting in the disruption of flight lines roosts and foraging areas would have an adverse effect on the conservation status of Bechstein's bat that is significant at the national level and at the regional level for the assemblage of other woodland bat species.
- 3.2.27 The SES for CFA12 summarises the effects on Bechstein's and other woodland bat species arising from new data obtained in 2014, and identifies a different effect on Bechstein's bat and other *Myotis* species caused by fragmentation of flight lines between Edgcott Road and the River Ray. Additional effects on bats identified in CFA13 are described below.
- 3.2.28 New flight lines for male Bechstein's bats were recorded in 2014 in the Calvert area that link newly recorded roosts (outside of the scheme) to foraging areas at Calvert Jubilee Nature Reserve, Decoypond Wood and Shrubs Wood. A proportion of habitat forming these flight lines will be removed from the west of the HS2 route and from the Aylesbury Link railway line. The disruption of flight lines will result in a different significant effect on Bechstein's bat. However, this change will not change the level of significance of the effects reported in the main ES.
- 3.2.29 New roosts and flight lines for brown long-eared bats were recorded at West Street and along Perry Hill to Calvert Jubilee Nature Reserve. The roosts are outside of the scheme and will not be affected. Both roads will be realigned over the HS2 route resulting in the loss of roadside vegetation that currently forms the flight lines, resulting in fragmentation of roosts and foraging areas. The disruption of flight lines will result in a different significant effect on the assemblage of woodland bats using the Aylesbury Link railway line and nearby habitats. However, this will not change the level of significance of the effects reported in the main ES.
- 3.2.30 The new baseline data not will result in any other new or different effects on species receptors of relevance at more than the local/parish level. Additional local/parish level effects (i.e. in addition to those identified in the main ES) arising from SES changes are listed in SES and AP2 ES Volume 5: Appendix EC-002-002.

Cumulative effects

- 3.2.31 There are no new or different likely cumulative effects for ecology as a result of the SES changes acting in combination with AP1 amendments, or as a result of any relevant committed development.

Other mitigation measures

- 3.2.32 The main ES provided for woodland planting in CFA12 and CFA13 with a total extent of greater than 30ha. The extent of habitat creation was determined principally by the need to mitigate the effect of habitat fragmentation on Bechstein's and other woodland bats. It also provided for compensation of the loss of approximately 1.5ha of ancient woodland from Sheephouse Wood in CFA12 (not within the SSSI) and 1.1ha from Decoypond Wood in CFA13, as well as approximately 3.7ha of largely scrub habitat from Calvert Jubilee Nature Reserve in CFA13. This planting will increase connectivity between ancient woodlands, including those on opposite sides of HS2 route via green bridges. The main ES states that the large increase in woodland extent will maintain the conservation status of woodland in the area, and that other measures such as translocating ancient woodland soils and associated seed bank will be carried out. Further detail is provided in ecological principles of mitigation Volume 5: Appendix CT-001-000/2 of the main ES.
- 3.2.33 The total extent of woodland losses has not changed due to the new baseline data, and given the large extent of woodland habitat creation already proposed within the main ES, the total extent of woodland habitat provision remains appropriate. In order to address the loss of 2.1ha of woodland that has been added to the ancient woodland inventory, where appropriate the soils from these areas will be translocated to existing areas of woodland habitat creation within the limits of the Bill (where soil translocation was previously not proposed). These works will be undertaken in accordance with ecological principles of mitigation technical note (Volume 5: Appendix CT-001-000/2 of the main ES).
- 3.2.34 Following the implementation and maturation of the proposed measures, a residual effect on ancient woodlands significant at the county/metropolitan level will remain. Ancient woodland is irreplaceable. However, there will be a permanent beneficial effect on broadleaved woodland due to the increased area of planting and woodland connectivity in the area. This effect is unchanged from that described in the main ES.
- 3.2.35 Measures to address the effects of habitat fragmentation on bats caused by the construction phase of the original scheme are described in Section 7.5 of the main ES. They comprise linear planting on the five green overbridges that will be provided between the Edgcott Road and School Hill, as well as linear planting to link the crossing points referred to in avoidance and mitigation measures for this amendment.
- 3.2.36 Existing roadside vegetation, that links a roost for brown long-eared bat recorded in 2014 to foraging habitat at Calvert Jubilee Nature Reserve, will be removed for the construction of Perry Hill and West Street overbridges, but this will be replaced by landscape planting proposed in the main ES.
- 3.2.37 No additional mitigation measures (i.e. in addition to those identified in the main ES) are required for the newly recorded flight lines of male Bechstein's bat associated with roosts near Calvert that were identified in 2014.

Summary of likely residual significant effects

- 3.2.38 The addition of woodland opposite Decoypond Wood and two unnamed woodlands south of Calvert will result in the loss of an additional 2.1ha of ancient woodland. Therefore, the total loss of ancient woodland in this area will be 3.2ha. This is a

different adverse residual effect on ancient woodland that is significant at the county/metropolitan level. Ancient woodland is an irreplaceable resource.

- 3.2.39 There are no other new or different residual effects on ecological receptors as a consequence of the SES scheme.

Effects arising from operation

- 3.2.40 Revised operational effects on the populations of Bechstein's bat and other woodland bat species which utilise habitats in both CFA12 and CFA13 are reported in SES and AP2 ES Volume 2 CFA12. The updated baseline information does not result in any other new or different operational effects on ecological receptors in CFA13.

3.3 Traffic and transport

Introduction

- 3.3.1 This section of the report provides a description of the environmental baseline in relation to traffic and transport that is relevant to the assessment. In addition, it identifies any new or different likely significant traffic and transport environmental effects as a result of the changes introduced in Section 2, compared to the original scheme.

Scope, assumptions and limitations

- 3.3.2 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.

Changes of relevance to this assessment

- 3.3.3 The correction to the main ES concerning a significant effect on Addison Road is relevant to this assessment; see Table 2.

- 3.3.4 Changes in other CFAs have resulted in changes to HGV movements in this CFA. These include:

- removal of the sustainable placement area at Hunt's Green Farm in CFA10 (SES- 010-001); and
- change to landscape earthworks near Lower Boddington in CFA15 (SES-015-001).

- 3.3.5 Whilst originating in other CFAs, these design changes have resulted in changes to forecast HGV traffic flows within CFA13 during construction, in comparison to those under the original scheme.

- 3.3.6 The main traffic and transport change associated with the SES changes is that Perry Hill between the boundary of CFA12 and West Street overbridge main compound, will no longer be used for the movement of excavated material, resulting in a decrease in HGV flows on this road. There will also be a decrease in HGV flows on Perry Hill between West Street, Gawcott and Buckingham Road/ Gawcott Road and the A421 between Buckingham Road/ Gawcott Road and the A4421, although these sections of road will still be used for the movement of excavated material. There will be an increase in HGV flows on the A41 between the boundary of CFA12 and the A4421

(Bicester), as this section of road (between The Broadway located in CFA12 and the A4421) will be used for the movement of excavated material in the SES scheme.

- 3.3.7 These changes have been assessed as they are considered to have the potential to result in new or different significant effects on traffic and transport.

Environmental baseline

Existing baseline

- 3.3.8 The existing baseline for traffic and transport is as set out in Volume 2, CFA13, Section 12.3 of the main ES. There is no change to the existing baseline as reported in the main ES.

Future baseline

Construction

- 3.3.9 The future baseline for construction remains unchanged from that reported in the main ES (Volume 2, CFA13, Section 12.3).

Operation (2026 and 2041)

- 3.3.10 The future baselines for operation in 2026 and 2041 remain unchanged from those reported in the main ES (Volume 2, CFA13, Section 12.3).

Effects arising during construction

Avoidance and mitigation measures

- 3.3.11 Avoidance and mitigation measures are as set out in Volume 2, CFA13, Section 12 of the main ES. No further traffic and transport avoidance or mitigation measures during construction are proposed.

Assessment of impacts and effects

Temporary effects

- 3.3.12 The change associated with the correction to the main ES (see Table 2) will give rise to a moderate adverse effect in relation to traffic-related severance⁶ for non-motorised users at Addison Road, north of the Bicester to Bletchley Line railway (minor adverse effect reported in the main ES).
- 3.3.13 The SES scheme results in amended HGV traffic flows compared to the original scheme in this CFA. The amended HGV flows give rise to different levels of significance with a minor adverse significant effect in relation to delays to vehicle users and congestion at the junction of the A421 with the A4421 and Sandpit Hill (moderate adverse effect based upon the original scheme).
- 3.3.14 The amended HGV flows with the SES scheme also result in new or different levels of significance with likely significant effects in relation to traffic related severance for non-motorised users at the following locations:

- A41, between the boundary of CFA12 and the A4421 (Bicester): increase in

⁶ In the context of this traffic and transport section, severance is used to relate to a change in ease of non-motorised users due to, for example, a change in travel distance or travel time or a change in traffic levels on a route that makes it harder for non-motorised users to cross. A reference to severance does not imply a route is closed to access.

HGV flows resulting in a moderate adverse significant effect (assessed as not significant in the main ES);

- Perry Hill, between West Street and Gawcott: decrease in HGV flows compared to the original scheme, resulting in a moderate adverse significant effect (major adverse effect reported in the main ES); and
- Perry Hill, between Buckingham Road and School Hill: decrease in HGV flows compared to the original scheme, resulting in the removal of the major adverse significant effect reported in the main ES under the link description 'Perry Hill, between Buckingham Road and West Street'. The remainder of this road, between West Street and School Hill, remains a major adverse effect due to the temporary diversion of traffic as a result of temporary road closures, as reported in the main ES.

3.3.15 Whilst HGV flows on Buckingham Road/Gawcott Road are reduced compared to the original scheme, this remains a major adverse effect as reported in the main ES in relation to traffic severance for non-motorised road users.

Permanent effects

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

Other mitigation measures

3.3.17 Other mitigation measures are as set out in Volume 2, CFA13, Section 12 of the main ES. No further traffic and transport avoidance or mitigation measures during construction are required.

Cumulative effects

3.3.18 Cumulative effects are reported in Volume 2, CFA13, Section 12 of the main ES. The above assessment has taken into account these cumulative effects, including planned development by taking account of background traffic growth, as well as traffic and transport impacts of works being undertaken in other areas.

Summary of likely residual effects

3.3.19 A correction to the main ES has changed the level of significance of the effects of traffic related severance for non-motorised users at Addison Road, north of the Bicester to Bletchley Line railway, resulting in a significant residual moderate adverse residual effect (reported as a minor adverse significant residual effect in the main ES).

3.3.20 SES scheme changes in other CFAs, in particular changes to the sustainable placement area at Hunt's Green Farm in CFA10 (SES-010-001) and reduction of earthworks near Old House Farm in CFA15 (SES-015-001), have resulted in a change to the routing of excavated material by road, and amended HGV flows within this CFA.

3.3.21 These amended flows will result in delays and congestion at the junction of the A421 with the A4421 and Sandpit Hill, reducing the significance of the residual effect from moderate adverse to minor adverse.

- 3.3.22 The amended flows will also result in a new moderate adverse residual significant effect with regard to traffic related severance for non-motorised users at the A41 between the boundary of CFA12 and A4421 (Bicester).
- 3.3.23 The amended flows will also result in the removal of the major adverse residual significant effect at Perry Hill, between Buckingham Road and School Hill reported in the main ES, under the description 'Perry Hill, between Buckingham Road and West Street'.
- 3.3.24 There is a moderate adverse residual significant effect with regard to traffic related severance for non-motorised users on Perry Hill between West Street and Gawcott, reducing the level of significance of the (major adverse significant effect reported in the main ES).
- 3.3.25 The significant residual effects that result from construction of the scheme are shown on SES and AP2 ES Map TR-03-057 (Volume 5, Traffic and Transport Map Book).

Effects arising from operation

- 3.3.26 There will be no changes arising from the SES scheme during operation, consequently there will be no new or different likely residual significant effects arising from operation of the SES scheme compared to those reported in Volume 2, CFA13 (Section 12) of the main ES.

Part 2: Additional Provision 2 Environmental Statement

4 Summary of amendments

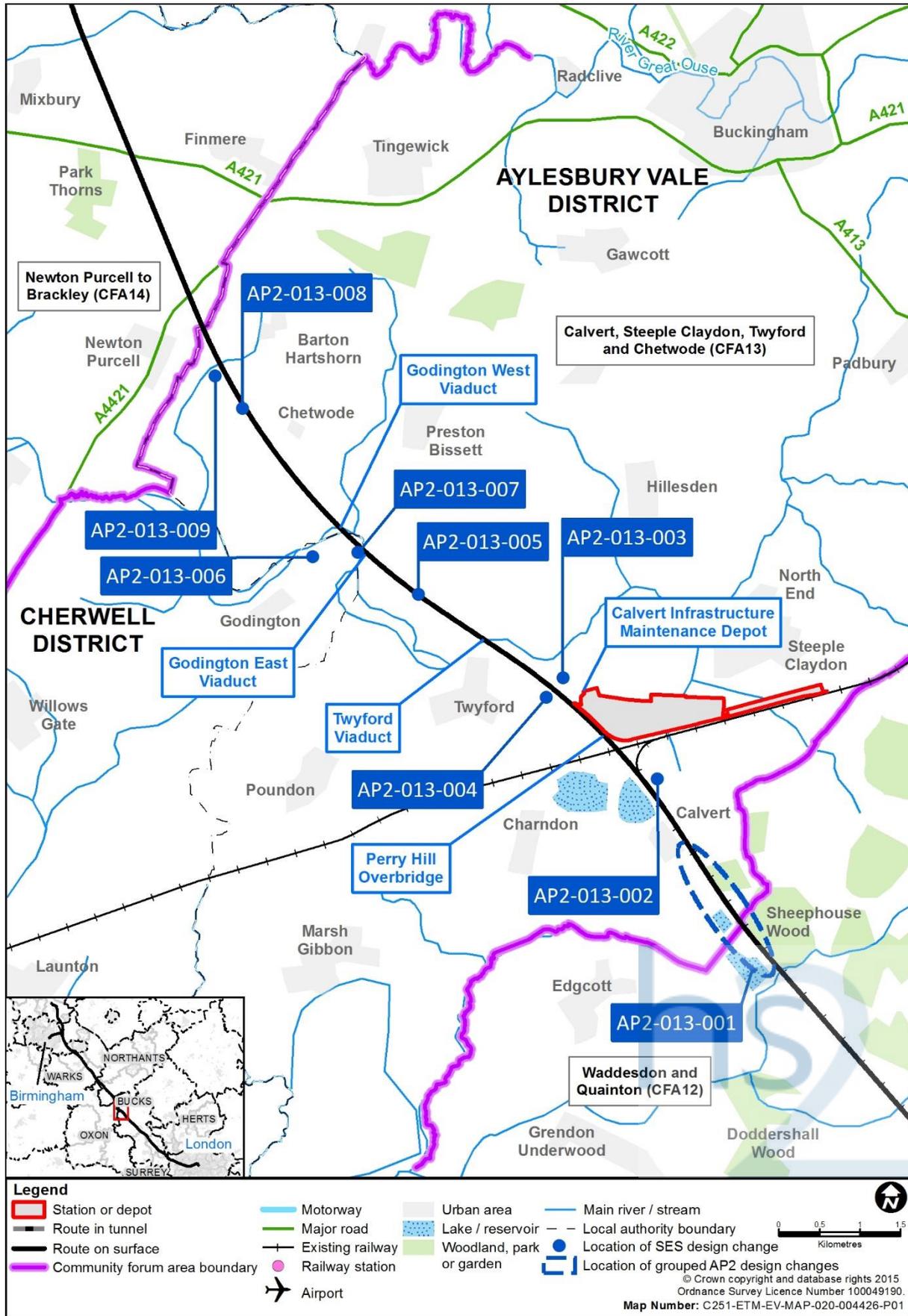
- 4.1.1 Table 5 provides a summary of the amendments in the Calvert, Steeple Claydon, Twyford and Chetwode CFA (CFA13). Figure 2 shows the locations.

Table 5: Summary of amendments in CFA13

Name of amendment	Description of the original scheme	Description of the AP2 revised scheme
<p>Bridleway diversion and footpath upgrades at Calvert Landfill site</p> <p>AP2-013-001</p>	<p>Construction of the original scheme alongside the existing Aylesbury Link rail line displaces bridleways CAG/3/1, GUN/25/1 and SCL/18/2, which are diverted parallel to the HS2 route.</p>	<p>The diversion for bridleways CAG/3/1, GUN/25/1 and SCL/18/2, which run parallel to the HS2 route, will be designated a footpath only and not a bridleway. An alternative bridleway route will be provided, which will have a permanent requirement for additional land outside the Bill limits. The amendment affects both CFA12 and CFA13.</p>
<p>Alteration of access track to Shepherd's Furze Farm</p> <p>AP2-013-002</p>	<p>The existing access track off Addison Road to Shepherd's Furze Farm, Steeple Claydon will not be upgraded for use by temporary construction and permanent maintenance vehicles.</p>	<p>The existing access track off Addison Road to Shepherd's Furze Farm will be widened for use by temporary construction and permanent maintenance vehicles. The amendment seeks a change of powers to enable widening of the existing access track. No additional land is required.</p>
<p>Realignment of Footpath TWY/18</p> <p>AP2-013-003</p>	<p>The original scheme will stop up Footpath TWY/18 on the east of the HS2 route and west of Perry Hill. A realigned footpath will be provided as far as Twyford.</p>	<p>Footpath TWY/18 at Perry Hill will be stopped up further to the east than the original scheme. A new footpath alignment will be provided. There will also be a realignment of the footpath west of the HS2 route. There is no permanent requirement for land outside the Bill limits.</p>
<p>Reconfiguration of access to Twyford sewage treatment works</p> <p>AP2-013-004</p>	<p>The proposed new permanent access to Twyford Sewage Treatment Works will use an existing access on West Street that is only suitable for vehicles approaching from the south.</p>	<p>The West Street junction will be realigned to allow vehicle access to Twyford Sewage Treatment Works from both directions. Associated access tracks will be widened and improved. There is a permanent requirement for additional land outside the Bill limits.</p>
<p>Closure of Restricted Byway PBI/5A/2 and provision of a replacement access road at Cowley Farm</p> <p>AP2-013-005</p>	<p>The original scheme provides for Footpath PBI/5A accommodation overbridge. The revised AP1 scheme removes this overbridge and diverts Footpath PBI/5 across the HS2 route via Restricted Byway PBI/5A accommodation overbridge. The temporary diversion of Restricted Byway PBI/5A over Footpath PBI/5 accommodation overbridge is removed from the revised AP1 scheme.</p>	<p>In order to achieve the overbridge, access and PRoW arrangements set out in the revised AP1 scheme, powers are sought to permanently stop up PBI/5A/2 and replace it with an access road. There is no permanent requirement for land outside the Bill limits.</p>

Name of amendment	Description of the original scheme	Description of the AP2 revised scheme
<p>Widening of bridleways CHW/24 and 225/4 for HS2 maintenance access</p> <p>AP2-013-006</p>	<p>The original scheme provides permanent maintenance access along bridleways CHW/24 and 225/4. A new section of access road parallel to the east of the rail alignment, between Bridleway CHW/24 and footpath PBI/9, is also proposed.</p>	<p>Bridleway CHW/24 will be widened and upgraded for permanent maintenance access. The section of proposed access road between Bridleway CHW/24 and Footpath PBI/9 will not be constructed. There is a permanent requirement for additional land outside the Bill limits.</p>
<p>Revised location for wetland habitat creation at Moat Farm, Godington</p> <p>AP2-013-007</p>	<p>An area of ecological mitigation will be located on farm land belonging to Moat Farm. The proposed wetland habitat will be located in a field to the east of the HS2 route.</p>	<p>The proposed wetland habitat will be relocated to an area of land between the HS2 route and the disused Great Central Main Line railway. The area of land required for the wetland habitat is similar to the original area, and is outside the limits of the Bill.</p>
<p>School End temporary realignment at Chetwode</p> <p>AP2-013-008</p>	<p>During temporary closure of School End overbridge for construction, School End (a road) will be rerouted via the A4421, for a period of between one year and one year and six months.</p>	<p>School End will have a temporary realignment across the HS2 route to allow it to remain open during construction of School End overbridge. There is a temporary requirement for additional land outside the Bill limits.</p>
<p>Minor works to upgrade an access track in Barton Hill Farm</p> <p>AP2-013-009</p>	<p>A farm access track is routed around the south and west sides of an existing pond at Barton Hill Farm.</p>	<p>The amendment seeks a change of powers to realign the access track around the north and east sides of the existing pond at Barton Hill Farm. No additional land is required.</p>

Figure 2: Locations of amendments in CFA13



5 Assessment of amendments

5.1 Bridleway diversion and footpath upgrades at Calvert Landfill site (AP2-013-001)

- 5.1.1 The Bill provides for bridleways CAG/3/1, GUN/25/1 and SCL/18/2 near Calvert Green, to be diverted from their existing locations and instead run parallel to the HS2 route (refer to map CT-05-054 and CT-06-054 in main ES Volume 2, CFA13 Map Book).
- 5.1.2 Since submission of the Bill it has been agreed with Buckinghamshire County Council that the diverted bridleways should not lie between the HS2 route and the access road to Calvert Landfill site as it is unsuitable for horse riders. An alternative bridleway route has been agreed that lies in both CFA12 and CFA13. The permanent new bridleway route will pass west of Calvert Landfill site via bridleways GUN/35/1, GUN/36/1 and GUN/36/2, and footpaths GUN/24/1, GUN/23/1, CAG/1/1, EDG/12/1, CAG/4/3 and CAG/5/1, all of which will be upgraded to bridleway status. Hedges may be trimmed and low-hanging tree limbs removed. About 3.2km of footpath will be upgraded to bridleway. The additional length of the permanent bridleway diversion compared to the original scheme will be about 2.2km, refer to map CT-05-054, CT-06-054, CT-05-054-L1, and CT-06-054-L1 in the SES and AP2 ES Volume 2, CFA13 Map Book).
- 5.1.3 The PRoW diversion that will run parallel to the HS2 route and was proposed in the original scheme will still be implemented, but it will be a footpath and not a bridleway.
- 5.1.4 The estimated duration of construction is three months, which is the same as the original scheme. The PRoW diversions will be permanent and require approximately 0.7ha of land outside of Bill limits.
- 5.1.5 The bridleway diversion and footpath upgrade at Calvert Landfill site 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; landscape and visual assessment; socio-economics; sound, noise and vibration; and water resources and flood risk assessment. However, there are changes where reassessment was considered to be required in respect of: cultural heritage and traffic and transport.

Cultural heritage

Scope, assumptions and limitations

- 5.1.6 The assessment scope, key assumptions and limitations for cultural heritage are set out in Volume 1, the SMR (Volume 5: Appendix CT001-000/01) and the SMR Addendum (Volume 5: Appendix CT-001-000/2) of the main ES.

Existing baseline

- 5.1.7 The cultural heritage baseline for the assessment takes into account information collected in support of the main ES, which included walk-over survey, geophysical survey, remote-sensing data, and data from national and local registers. A full list is provided in Volume 2, Section 6.3 of the main ES. In addition, the baseline has been updated with the results of additional survey work comprising geophysical and walk-over surveys for archaeology. A review of the ancient woodland inventory published

by Natural England in 2014 has been carried out to identify woodlands that have been added to the inventory since submission of the main ES.

- 5.1.8 The new land required for the amendment does not encroach on any designated sites or built heritage assets. The diverted bridleway runs around the edge of the former Calvert Brickworks (asset reference CAL005). The site is now landfill and is not considered to have any cultural heritage interest. The landfill is likely to have removed the potential for archaeological remains.
- 5.1.9 The baseline resources are described in the main ES (see Volume 2, CFA13, Section 6 and Volume 5: Appendix CH-001-013).

Future baseline

Construction (2017)

- 5.1.10 The future baseline for construction in 2017 remains unchanged from that reported in the main ES (Volume 2, CFA13, Section 6.3).

Operation (2026)

- 5.1.11 The future baseline for operation in 2026 remains unchanged from that reported in the main ES (Volume 2, CFA13, Section 6.3).

Effects arising during construction

- 5.1.12 The land required for the bridleway diversion does not encroach on any heritage assets previously identified, or their setting. The former Calvert Brickworks (asset reference CAL005) is now a landfill site and all archaeological remains are likely to have been removed. The bridleway diversion 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.

Effects arising from operation

- 5.1.13 The bridleway diversion 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

- 5.1.14 No additional mitigation measures are required. The amendment will result in no change in the likely residual significant effects reported in the main ES.

Cumulative effects

- 5.1.15 There are no new or different likely significant cumulative effects for cultural heritage as a result of the proposed amendment acting in combination with another amendment in AP2, or as a result of any relevant committed development interacting with the AP2 revised scheme.

Traffic and transport

Scope, assumptions and limitations

- 5.1.16 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. There is no change to the scope, assumptions and limitations as reported in the main ES.

Existing baseline

- 5.1.17 The environmental baseline for traffic and transport is set out in Volume 2, CFA13, Section 12 of the main ES. There is no change to the existing baseline as reported in the main ES.

Future baseline

Construction

- 5.1.18 The future baseline for construction remains unchanged from that reported in the main ES (Volume 2, CFA13, Section 12.3).

Operation (2026 and 2041)

- 5.1.19 The future baselines for operation in 2026 and 2041 remain unchanged from those reported in the main ES (Volume 2, CFA13, Section 12.3).

Effects arising during construction

- 5.1.20 The bridleway diversions and footpath upgrades at Calvert Landfill site 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.

Effects arising from operation

- 5.1.21 The amendment will result in three new, permanent, minor adverse significant effects at the following PRow for equestrians, in relation to increased travel distances due to the 2.2km diversion in total (refer to SES and AP2 ES Volume 5, Map TR-04-068, Traffic and Transport Map Book). The affected bridleways are:

- Bridleway GUN/25/1 (in CFA12);
- Bridleway CAG/3/1 (almost entirely in CFA12); and
- Bridleway SCL/18 (in CFA13).

Mitigation and residual effects

- 5.1.22 No changes to the mitigation described in the main ES (Volume 2 CFA13, Chapter 12) are required.
- 5.1.23 The bridleway diversions result in new minor adverse significant residual effects on equestrians due to increased travel distances at PRow GUN/25/1, CAG/3/1 and SCL/18.
- 5.1.24 The significant effects that result from operation of the scheme are shown on Map TR-04-068 (SES and AP2 ES Volume 5, Traffic and Transport Map Book).

Cumulative effects

- 5.1.25 Cumulative effects are reported in Section 12, Volume 2, CFA13, Section 12 of the main ES. The above assessment has taken into account these cumulative effects, including planned development by taking account of background traffic growth, as well as traffic and transport impacts of works being undertaken in other areas.

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

- 5.2.1 The bridleway diversion and footpath upgrades at Calvert Landfill site would result in three new, permanent, minor adverse significant residual effects that were not reported in the main ES. However, the amendment will provide a more suitable bridleway route for horse riders during operation and will increase the total length of bridleways in the locality.

5.3 Alteration of access track to Shepherd's Furze Farm (AP2-013-002)

- 5.3.1 The Bill provides for the existing access track off Addison Road to Shepherd's Furze Farm, Steeple Claydon to be used for construction and maintenance access. The original scheme did not propose widening of the access track (refer to main ES map CT-05-056 in main ES Volume 2, CFA13 Map Book).
- 5.3.2 Since submission of the Bill, the need to increase powers to enable widening of the existing access track has been proposed to ensure that it is suitable for construction and maintenance vehicles. No additional land is required.
- 5.3.3 The amendment requires a change in land use which results in a need to change powers in the Bill. The widening of the access track to Shepherd's Furze Farm is 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 any environmental topic.

5.4 Realignment of Footpath TWY/18 (AP2-013-003)

- 5.4.1 The Bill provides for the permanent diversion of Footpath TWY/18 at Twyford, which would be stopped up on the east of the HS2 route, about 140m west of where the footpath crosses Perry Hill (a road). A new footpath would have been constructed from this location south across a field to West Street then crossing the proposed route via the West Street overbridge. The diverted footpath then follows the route of the disused GCML railway to Twyford (refer ES map CT-05-056 and CT-06-056 in main ES Volume 2, CFA13 Map Book).
- 5.4.2 Since submission of the Bill two changes to the Footpath TWY/18 have been identified. To the east of the HS2 route, the footpath will be realigned along the wide verges of Perry Hill and West Street rather than cross the field west of Perry Hill. The footpath will be stopped up at Perry Hill, about 80m further east than in the original scheme. The diverted footpath in the AP2 revised scheme will be aligned along the verges of Perry Hill, then west along West Street to join the route proposed in the original scheme. The new diversion, east of the HS2 route, will be about 70m shorter than in the original scheme.

- 5.4.3 West of the HS2 route, Footpath TWY/18 will be extended to avoid the steep slope of an embankment built for the overbridge. In the original scheme Footpath TWY/18 would have turned sharply north immediately after crossing the West Street overbridge, allowing the footpath to follow a route alongside the disused GCML railway. In order to avoid the steep slope of the overbridge embankment the realigned footpath will extend about 170m along West Street on top of the embankment and then double back along the bottom of the embankment (refer to maps CT-05-056 and CT-06-056 in the SES and AP2 ES Volume 2, CFA13 Map Book).
- 5.4.4 The two changes together will add about 160m to the length of the footpath compared to the original scheme. The duration required to implement the realignment of the footpath will be one month, which is the same as the original scheme. The new footpath alignment will not require additional land outside of the limits of the Bill.
- 5.4.5 The realignment of Footpath TWY/18 is 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 any environmental topic.

5.5 Reconfiguration of access to Twyford sewage treatment works (AP2-013-004)

- 5.5.1 The Bill provides for permanent access to Twyford sewage treatment works on the west of the HS2 route. The junction for the access road will be on the north of West Street and would currently only be suitable for vehicles approaching from the south (refer to main ES map CT-05-056 and CT-06-056 in main ES Volume 2, CFA13 Map Book).
- 5.5.2 Since submission of the Bill, the design of the junction with West Street has been reviewed and the need for vehicle access from both directions identified. The junction will be improved. The design of the sewage treatment works access track will include two passing places and the 120m section of access track between West Street and the balancing pond south of West Street will be improved for use by maintenance vehicles (refer to AP2 map CT-05-056 and CT-06-056 in the AP2 ES Volume 2, CFA13 Map Book).
- 5.5.3 The estimated duration of construction is one month, which is in addition to that stated in the original scheme. The additional land required for the West Street junction realignment is approximately 750m². This will be required permanently and is outside the Bill limits.
- 5.5.4 The reconfiguration of West Street junction is 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; landscape and visual assessment; socio-economics; sound, noise and vibration; traffic and transport; and water resources and flood risk assessment. However, there were changes where reassessment was considered to be required in respect of cultural heritage.

Cultural heritage

Scope, assumptions and limitations

- 5.5.5 The assessment scope, key assumptions and limitations for cultural heritage are set out in Volume 1, the SMR (Volume 5: Appendix CT001-000/01) and the SMR Addendum (Volume 5: Appendix CT-001-000/2) of the main ES.

Existing baseline

- 5.5.6 The cultural heritage baseline for the assessment takes into account information collected in support of the main ES, which included walk-over survey, geophysical survey, remote-sensing data, and data from national and local registers. A full list is provided in Volume 2, Section 6.3 of the main ES. In addition, the baseline has been updated with the results of additional survey work comprising geophysical and walk-over surveys for archaeology. A review of the ancient woodland inventory published by Natural England in 2014 has been carried out to identify woodlands that are likely to be added to the inventory since submission of the main ES.
- 5.5.7 The land required for the amendment does not encroach on any designated sites or built heritage assets. The amendment is in an area that formed the hinterland of medieval Twyford with shrunken medieval village earthworks 300m west of the amendment including a moated feature (asset references CALo44) of low heritage value and the deserted village (asset reference CALo50) of moderate heritage value. There are agricultural features dating to this period, in the form of ridge and furrow field system located 590m north-east of the amendment (asset reference CALo124), which is of low heritage value.
- 5.5.8 There is evidence of later development in the post medieval period; approximately 120m to the north of the access road junction is the disused GCML railway (asset reference CALo18), along with an associated railway bridge (asset reference CALo18); both are assets of low heritage value. Approximately 150m south-east of the amendment is Portway Farm (asset reference CALo43); an 18th century model farm, with its setting not contributing to its low heritage value.
- 5.5.9 The baseline resources are described in the main ES (see CFA13, Section 6 and Volume 5: Appendix CH-001-013).

Future baseline

Construction (2017)

- 5.5.10 The future baseline for construction in 2017 remains unchanged from that reported in the main ES (Volume 2, CFA13, Section 6.3).

Operation (2026)

- 5.5.11 The future baseline for operation in 2026 remains unchanged from that reported in the main ES (Volume 2, CFA13, Section 6.3).

Effects arising during construction

- 5.5.12 The land required for the reconfigured access will not encroach on any heritage assets previously identified or their settings. The reconfigured access to Twyford sewage

treatment works 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

Effects arising from operation

- 5.5.13 The reconfigured access to Twyford sewage treatment works 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

- 5.5.14 No additional mitigation measures are required. The reconfigured access to Twyford sewage treatment works will result in no change in the likely residual significant effects reported in the main ES.

Cumulative effects

- 5.5.15 There are no new or different likely significant cumulative effects for cultural heritage as a result of the proposed amendment acting in combination with another amendment in AP2, or as a result of any relevant committed development interacting with the AP2 revised scheme.

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

- 5.6.1 The reconfiguration of access to Twyford sewage treatment works does not change the significance of the environmental effects or proposed mitigation as set out in the main ES (Volume 2, CFA13, Calvert, Steeple Claydon, Twyford and Chetwode).

5.7 Closure of Restricted Byway PBI/5A/2 and provision of a replacement access road at Cowley Farm (AP2-013-005)

- 5.7.1 The original scheme provides for Footpath PBI/5A accommodation overbridge. The AP1 revised scheme removes this overbridge and diverts Footpath PBI/5 across the HS2 route via Restricted Byway PBI/5A accommodation overbridge. The temporary diversion of Restricted Byway PBI/5A via Footpath PBI/5 accommodation overbridge is removed from the AP1 revised scheme, which will require permanent closure of Restricted Byway PBI/5A/2 (a short section of Restricted Byway PBI/5A). The through route of the PRoW will be restored by construction of a farm access road on a similar alignment to Restricted Byway PBI/5A/2.
- 5.7.2 The AP1 revised scheme did not seek powers to permanently stop up Restricted Byway PBI/5a/2. This amendment therefore seeks additional powers to stop up Restricted Byway PBI/5A and provide a permanent replacement. The environmental impact of this amendment has already been assessed in the AP1 amendment AP1-013-018 and AP1-013-019, see Volume 2: Section 24 of the AP1 ES.
- 5.7.3 The closure of Restricted Byway PBI/5A/2 and the provision of a replacement access road 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 any environmental topic.

5.8 Widening of bridleways CHW/24 and 225/4 for HS2 maintenance access (AP2-013-006)

- 5.8.1 The Bill provides for permanent maintenance access along bridleways CHW/24 and 225/4. The bridleways are also used as a farm access track which extends from The Green, a road north-east of the HS2 route, to Moat Farm south-west of the HS2 route. A new section of access track was proposed between Bridleway 225/4 and Footpath PBI/9 further south along the HS2 route. This section would have been adjacent to the east side of the railway alignment (refer to main ES map CT-05-058, CT-06-058, CT-05-058-L1, CT-06-058-L1 in main ES Volume 2, CFA13 Map Book).
- 5.8.2 Since submission of the Bill, it has been identified that the existing farm access track, which is also used as a bridleway, is too narrow for maintenance vehicles to access the viaducts and balancing pond. Works will include upgrading and widening of bridleways CHW/24 and 225/4 to provide passing points. About 10m on either side of the centreline of the bridleway has been allowed for the construction of drainage and fencing. The level of the existing farm access track used by the bridleways will not be raised as a result of the upgrading. The section of proposed access road parallel to the east of the HS2 route, between Bridleway CHW/24 and Footpath PBI/9, will be removed from the AP2 revised scheme (refer to map CT-05-058, CT-06-058, CT-05-058-L1 and CT-06-058-L1 in the SES and AP2 ES Volume 2, CFA13 Map Book).
- 5.8.3 Construction works are estimated to last for three months, which is in addition to the one year and six months required for the construction of the Godington West Viaduct proposed in the original scheme. Removal of the proposed access road parallel to the east of the HS2 route will reduce the construction works required within the Bill limits. The upgrade works will occur on land both within and outside of the Bill limits. The widening of the bridleways will require approximately 2.0ha of land permanently, which will be additional to the land within the Bill limits.
- 5.8.4 Upgrading the accommodation access tracks and associated works 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; land quality; landscape and visual assessment; socio-economics; sound, noise and vibration; and traffic and transport. However there were changes where reassessment was considered to be required in respect of: cultural heritage; ecology; and water resources and flood risk assessment.

Cultural heritage

Scope, assumptions and limitations

- 5.8.5 The assessment scope, key assumptions and limitations for cultural heritage are as set out in Volume 1, the SMR (Volume 5: Appendix CT001-000/01) and the SMR Addendum (Volume 5: Appendix CT-001-000/2) of the main ES.

Existing baseline

- 5.8.6 The cultural heritage baseline for the assessment takes into account information collected in support of the main ES, which included walk-over survey, geophysical survey, remote-sensing data, and data from national and local registers. A full list is provided in Volume 2, Section 6.3 of the main ES. In addition, the baseline has been updated with the results of additional survey work comprising geophysical and walk-

over surveys for archaeology (refer to SES and AP2 ES Volume 5: Appendix CH-004-013). A review of the ancient woodland inventory published by Natural England in 2014 has been carried out to identify woodlands that are likely to be added to the inventory since submission of the main ES.

- 5.8.7 The new land required for the amendment does not encroach on any designated sites or built heritage assets. Moat Farmhouse and the Church of Holy Trinity (asset reference CAL073) lie 85m and 70m to the south-west of the amendment, respectively. Both assets are of moderate heritage value.
- 5.8.8 Archaeological potential is indicated by: prehistoric enclosures recorded from cropmarks (asset reference CAL075); medieval and later remains associated with Godington shrunken medieval village (asset reference CAL072), an area of moderate heritage value 75m to the south-west; and Chetwode post medieval historic landscape (asset reference CAL127) of low value located 60m east.

Future baseline

Construction (2017)

- 5.8.9 The future baseline for construction in 2017 remains unchanged from that reported in the main ES (Volume 2, CFA13, Section 6.3).

Operation (2026)

- 5.8.10 The future baseline for operation in 2026 remains unchanged from that reported in the main ES (Volume 2, CFA13, Section 6.3).

Effects arising during construction

- 5.8.11 The bridleway widening does not encroach onto any of the heritage assets previously identified or alter their settings.
- 5.8.12 The bridleway widening will therefore not give rise to a new or different significant effect and will not change the level of significance of the effects reported in the main ES

Effects arising from operation

- 5.8.13 The proposed bridleway widening 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

- 5.8.14 No additional mitigation measures are required. The amendment will result in no change in the likely residual significant effects reported in the main ES.

Cumulative effects

- 5.8.15 There are no new or different likely significant cumulative effects for cultural heritage as a result of the proposed amendment acting in combination with another amendment in AP2, or as a result of any relevant committed development interacting with the AP2 revised scheme.

Ecology

Scope, assumptions and limitations

- 5.8.16 The assessment scope for ecology is as set out in Volume 1 of the SES and AP2 ES. The key assumptions and limitations, and the methodology for determining significance of effects are as set out in Volume 1, the SMR (Volume 5: Appendix CT-001-000/01) and the SMR Addendum (Volume 5: Appendix CT-001-000/02) of the main ES.
- 5.8.17 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 AP2 revised scheme.

Existing baseline

- 5.8.18 The ecological baseline of the land required for the amendment has been based on field data collated for the main ES, aerial photography and relevant existing information gathered from national organisations and from regional and local sources including: Buckinghamshire and Milton Keynes Environmental Records Centre; Berkshire, Buckinghamshire and Oxfordshire Wildlife Trust; Environment Agency; and North Bucks Bat Group.
- 5.8.19 A summary of the baseline information relevant to the assessment of the amendment is provided below. This takes account of any relevant new or updated baseline information provided in SES and AP2 ES Volume 5: Appendix EC-001-002. For those receptors described in the main ES, further details are provided in Volume 2, CFA13, Section 7.3 and in Volume 5, including maps EC-01 to EC-12.

Designated sites

- 5.8.20 There are no statutory or non-statutory designated nature conservation sites or areas of ancient woodland relevant to the assessment. Statutory and non-statutory designated sites are described in the main ES, Volume 2, CFA13, Section 7 and are shown on Maps EC-01-028b to EC-01-031a, Volume 5, Ecology Map Book.

Habitats

- 5.8.21 Approximately 520m of hedgerow habitat is present in the area of land required for the upgrading and widening of bridleways CHW/24 and 225/4. Of those accessible and assessed, approximately 370m qualifies as important hedgerow (under the Hedgerows Regulations 1997⁷). It is assumed that further important hedgerows are likely to be present on land that was not available to be surveyed, including additional land required for the widening works. Owing to the presence of established and important hedgerows, and to the habitat connectivity that they provide in an arable-dominated landscape, the hedgerow network is of district/borough value.
- 5.8.22 There is one pond immediately south of Padbury Brook, directly adjacent to land required for the upgrading and widening of Bridleway 225/4. A further two ponds, near Moat Farm either side of Bridleway 225/4, lie approximately 20m from land

⁷ *The Hedgerows Regulations 1997 (1997 No. 1160)*. London. Her Majesty's Stationery Office.

required. The three ponds collectively form part of the wider resource of ponds and are up to district/borough value.

- 5.8.23 Woodland in the vicinity of this amendment, including stands at Moat Farm in Godington, is not classified as a habitat of principal importance. An additional area of this woodland is within the land required for the upgrading and widening of bridleways CHW/24 and 225/4. Woodlands of similar size are widespread locally and are evaluated as being of local/parish value.
- 5.8.24 Scrub habitat is present along the Padbury Brook and its tributaries, surrounding the pond adjacent to the amendment and along the disused GCML railway, which is adjacent to land required for the upgrading and widening of bridleways CHW/24 and 225/4. This habitat type is common in the wider area and is of local/parish value.
- 5.8.25 Land required for the amendment crosses a minor tributary of Padbury Brook. This unnamed tributary is part of the wider resource of watercourses and is up to local/parish value.
- 5.8.26 The majority of the land required for the upgrading and widening of bridleways CHW/24 and 225/4 to the north-east and south-west of the disused GCML railway is arable land and species-poor semi-improved grassland. Other habitats present include improved grassland, amenity grassland and scattered trees. None of these habitats are of greater than local/parish value.
- 5.8.27 Habitats surrounding the land required for the amendment are described in the main ES, Volume 2, CFA13, Section 7 and are shown on Maps EC-02-028b to EC-02-031a, Volume 5, Ecology Map Book.

Protected and/or notable species

- 5.8.28 It is assumed that a metapopulation of great crested newt may be present in the unsurveyed ponds north-east of Godington, which includes the pond located immediately south of the Padbury Brook and the two ponds near Moat Farm. The metapopulation is assumed to be of up to county/metropolitan value.
- 5.8.29 There is an otter population on the Padbury Brook and its tributaries. Evidence of otter presence was recorded during field surveys along the main watercourse east of Godington. The otter population is of county/metropolitan value.
- 5.8.30 Linear habitat suitable for reptiles along the disused GCML railway east of Godington is relevant to this amendment. This main ES reports that on a precautionary basis this habitat could support a reptile assemblage of up to county/metropolitan value.
- 5.8.31 The assemblage of bats assumed in the main ES to be present between Twyford and Chetwode are of district/borough value. The land required for the upgrading and widening of bridleways CHW/24 and 225/4 includes features such as hedgerows, woodland and scrub that provide suitable habitat for bats, and may be utilised by this assemblage.
- 5.8.32 Badger populations recorded utilising land required for the construction of the original scheme are of local/parish value. Given the presence of suitable habitat within land required for the upgrading and widening of bridleways CHW/24 and 225/4, this area may also support badgers.

- 5.8.33 Locations of species records are illustrated in the main ES on Maps EC-01 to EC-12, Volume 5, Ecology Map Book.

Future baseline

Construction (2017)

- 5.8.34 The future baseline for construction in 2017 remains unchanged from that reported in the main ES (Volume 2, CFA13, Section 7.3).

Operation (2026)

- 5.8.35 The future baseline for operation in 2026 remains unchanged from that reported in the main ES (Volume 2, CFA13, Section 7.3).

Effects arising during construction

Avoidance and mitigation measures

- 5.8.36 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.

Designated sites

- 5.8.37 The amendment 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

- 5.8.38 Hedgerows relevant to the amendment are part of the hedgerow network in the wider landscape. The loss of hedgerows was reported in the main ES as resulting in an adverse effect significant at the district/borough level. Vegetation clearance required for the upgrading and widening of bridleways CHW/24 and 225/4 would result in the additional removal of approximately 100m of important hedgerow to the north of the HS2 route and approximately 150m of hedgerow to the south-west of the HS2 route. The latter could also qualify as an important hedgerow and may be removed during the widening of Bridleway 225/4. The amendment will result in a different significant effect on conservation status of hedgerows. However, this change will not alter the level of significance of the effects reported in the main ES.
- 5.8.39 It is unlikely that the amendment will result in any other new or different effects on habitat receptors of relevance at more than the local/parish level. Additional local/parish level effects (i.e. in addition to those identified in the main ES) arising from the amendment are listed in SES and AP2 ES Volume 5: Appendix EC-002-002.

Protected and/or notable species

- 5.8.40 The main ES reports that severance of hedgerows between Twyford and Chetwode will have an adverse effect on the assumed population of bats in this area due to the removal of foraging and commuting habitat for bats that is significant at the district/borough level. The removal of additional hedgerow habitat for upgrading and widening of bridleways CHW/24 and 225/4 will further contribute to the severance effect on the bat assemblage assumed to be using this habitat. It will also involve the

removal of trees which were not accessible for survey. Taking a precautionary approach to the assessment, the removal of these trees could lead to the loss of bat roosts. The loss of roosts combined with the loss of adjacent foraging and commuting habitat would result in a different effect on the conservation status of bat populations which would be significant at up to the district/borough level. This is a different significant effect to that which is reported in the main ES. However, the level of significance of the effect is unchanged from the main ES.

- 5.8.41 It is unlikely that the amendment will result in any other new or different effects on habitat receptors of relevance at more than the local/parish level. Additional local/parish level effects (i.e. in addition to those identified in the main ES) arising from the amendment are listed in SES and AP2 ES Volume 5: Appendix EC-002-002.

Cumulative effects

- 5.8.42 There are no new or different likely cumulative effects for ecology as a result of the proposed amendment acting in combination with another amendment in AP2, or in AP1, as a result of any relevant committed development interacting with the AP2 revised scheme.

Mitigation and residual effects

Other mitigation measures

- 5.8.43 Replacement hedgerow habitat will be provided once the access track is complete and will provide connections to existing habitat within the landscape to compensate for the losses of wildlife corridors that hedgerows provide. The hedgerow replanting will be undertaken in accordance with the ecological principles of mitigation (main ES Volume 5: Appendix CT-001-000/2).
- 5.8.44 The habitat creation measures set out in the main ES are sufficient to compensate for the additional loss of other habitats such as dense scrub, semi-improved grassland and woodland, as well as the additional loss of habitat potentially suitable for grass snake and other reptiles.
- 5.8.45 The potential loss of bat roosts as a result of the upgrading and widening of bridleways CHW/24 and 225/4, will be addressed through appropriate measures in line with those discussed in the main ES. Measures will include compensatory roost provision in accordance with the ecological principles of mitigation (Volume 5: Appendix CT-001-000/2) set out in the main ES. Where required these measures will be provided south of Godington viaduct over the Padbury Brook in an area of grassland habitat creation with connectivity provided via the retained vegetation along the disused GCML railway. Through the implementation of these measures it is expected that any adverse effects on bats arising from the construction activities required for the upgrading and widening of bridleways CHW/24 and 225/4 will be reduced to a level where they are not significant.

Summary of likely residual effects

- 5.8.46 No new or different residual effects on ecological receptors occur as a consequence of the amendment. The significant residual effects of the AP2 revised scheme in this area are therefore unchanged from those reported in the main ES.

Effects arising from operation

- 5.8.47 The amendment will not give rise to new or different significant effects on designated sites, habitats or species and will not change the level of significance of the effects reported in the main ES.

Water resources and flood risk assessment

Scope, assumptions and limitations

- 5.8.48 The assessment scope, key assumptions and limitations for water resources and flood risk 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.
- 5.8.49 The assessment assumes that the upgrade to the bridleways to form an access road will involve widening and resurfacing, but that the road surface will remain level with surrounding ground, in particular where it passes through replacement flood storage areas.
- 5.8.50 Detailed hydraulic modelling has been undertaken for the Padbury Brook and its tributaries at Twyford and Godington. The outputs from this model are shown on Maps WR-05-028 to WR-05-031 and WR-06-028 to WR-06-031 (Volume 5, Water Resources and Flood Risk Assessment Map Book of the main ES). The limitations associated with flood risk within this study area are described in detail in the Volume 5: Appendix WR-003-013 of the main ES.
- 5.8.51 The assessment reviews the potential impact of the upgraded bridleway on water resources and flood risk. Specifically, the effect of bridleway works within the proposed replacement flood storage area on the effectiveness of flood mitigation, and of the works on the Padbury Brook is considered.

Existing baseline

- 5.8.52 Water Framework Directive (WFD) surveys covering hydromorphological and ecological walk-overs have been undertaken in this CFA since submission of the main ES. These surveys were carried out on the Twin and the Padbury Brook (The Twins) water bodies. Details of all survey work undertaken in this CFA since September 2013 is provided in Volume 5: Appendix WR-001-000 (Annex A Surface Water).
- 5.8.53 The baseline water resources and flood risk information for the Calvert, Steeple Claydon, Twyford and Chetwode area is described in the main ES (Volume 2, CFA13, Section 13).
- 5.8.54 Table 6 includes features potentially affected by the widening of the bridleways.

Table 6: Surface water features potentially affected by the amendment

Water feature	Location description (and map reference)	Watercourse classification	WFD water body (water body ref number) and current overall status	WFD status objective (by 2027* as per RBMP ⁸)	Receptor value
Padbury Brook	Padbury Brook north-east of Godington SWC-CFA13-09)	Ordinary watercourse	Padbury Brook (The Twins) (GB105033038210) Moderate Potential	Good Potential	High
Unnamed drain	An unnamed drain at Moat Farm.	Ordinary watercourse	No status shown in RBMP – assumed status (from Padbury brook) Moderate Potential	No status shown in RBMP – assumed status (from Padbury brook) Good Potential	Moderate
Unnamed drain	An unnamed drain flowing east and crossed by the route, north-east of Godington. (SWC-CFA13-10)	Ordinary watercourse	No status shown in RBMP – assumed status (from Padbury brook) Moderate potential	No status shown in RBMP – assumed status (from Padbury brook) Good Potential	Moderate

* year may vary in different RBMPs

- 5.8.55 The site is underlain by the Lower Oxford Clay Formation (classified as unproductive strata and is not assessed under WFD) underlain by the Kellaways Formation (classified as a Secondary A aquifer) which are both part of the Ancholme Group. The Kellaways Formation is part of the Upper Bedford Ouse Oolite Secondary groundwater body⁹ which has a current overall status¹⁰, under the WFD, of Good with the objective for 2015 also being Good status.
- 5.8.56 Bedrock in the valley of the Padbury Brook is overlain by superficial deposits comprising Alluvium. These superficial deposits are classified as a Secondary A aquifer and are likely to contain groundwater.
- 5.8.57 There is one licensed surface water abstraction within 1km of the bridleways (as detailed in Volume 5: Appendix WR-002-015 of the main ES).
- 5.8.58 There is an existing flow restriction within the catchment of the Padbury Brook throughout this area, caused by the embankments and underbridges of the disused GCML railway. Owing to the complexity of the interactions between the scheme and the watercourse, a site-specific hydraulic model was created as part of the main ES to better understand the potential impacts to the risk of flooding in the Padbury Brook catchment. Further details on the modelling undertaken as part of the assessment are

⁸ RBMP - River Basin Management Plan

⁹ WFD water body reference, GB40502G401300

¹⁰ Environment Agency (2009) River Basin Management Plan, Thames River Basin District

presented in the CFA13 Flood Risk Assessment (Volume 5: Appendix WR-003-013) of the main ES.

- 5.8.59 The widened bridleways do not pass through the modelled 1 in 100 years return period (1% annual probability) including climate change floodplain between Moat Farm and the existing underpass beneath the disused GCML railway. However, the bridleways pass through environmental mitigation (replacement floodplain storage) on the upstream side of the disused GCML railway embankment.
- 5.8.60 Land use in the floodplain in the vicinity of the amendment is arable farm land and pasture (moderate value receptor), together with a residential property, Moat Farm at Godington (high value receptor).
- 5.8.61 There have been no recorded historical incidents of groundwater flooding within the study area.
- 5.8.62 The Aylesbury Vale and Cherwell Strategic Flood Risk Assessment (SFRA) reports do not identify any specific groundwater flood risks in the study area. However, the Buckinghamshire Preliminary Flood Risk Assessment (PFRA) identifies that a proportion of the land (more than 75%) at the Padbury Brook is susceptible to groundwater emergence. The Oxfordshire PFRA identifies that a significant proportion of the land at Godington (more than 75%) is susceptible to groundwater emergence. Therefore, there is a potential risk of groundwater flooding in the area of the amendment.
- 5.8.63 An area is shown on the Environment Agency reservoir inundation map that has a risk of flooding associated with a failure of Tusmore Park Lake. The modelled flood paths from this water body follow the course of the Padbury Brook and its floodplain. Although there is the potential to affect the extent and depth of residual risk of flooding from Tusmore Park Lake by way of works in the mapped flood extent, the likelihood of such flooding occurring is extremely low and is therefore not considered further in this assessment.

Future baseline

Construction (2017)

- 5.8.64 The future baseline for construction in 2017 remains unchanged from that reported in the main ES (Volume 2, CFA13, Section 13.3).

Operation (2026)

- 5.8.65 The future baseline for operation in 2026 remains unchanged from that reported in the main ES (Volume 2, CFA13, Section 13.3).

Effects arising during construction

- 5.8.66 Superficial deposits that may contain shallow groundwater are present in the catchment of the Padbury Brook. The superficial deposits are likely to be in hydraulic connectivity with the local watercourses. There is the potential that construction could impact on the flow of groundwater in these deposits, but given the limited depth and scale of construction this is assessed to be a negligible impact with neutral effect, and therefore is not significant.

- 5.8.67 The access route will be constructed using best practice as described in Section 16 of the draft CoCP, which will help ensure no contamination occurs to groundwater or connected surface water bodies giving negligible impact with neutral effect, which is not significant.
- 5.8.68 Assuming upgrading and widening of the bridleways will not be raised relative to surrounding ground including ground levels lowered to construct the replacement floodplain storage, the amendment will not adversely affect the performance of the replacement flood storage area or the flow mechanisms in the Padbury Brook. Consequently, there will be no significant adverse effects on flood risk from rivers as a result of the amendment.
- 5.8.69 The widening of bridleways CHW/24 and 225/4 for HS2 maintenance access will not give rise to new or different significant effects on water resources or flood risk during construction and will not change the level of significance of the effects reported in the main ES.

Effects arising from operation

- 5.8.70 Generic design measures will be implemented to avoid significant adverse effects on the quality and flow characteristics of surface watercourses and groundwater bodies during operation of the AP2 revised scheme. These are described in the main ES Volume 1 and in the operation and maintenance plan for water resources and flood risk included in Volume 5 Appendix WR-001-000.
- 5.8.71 The widening of bridleways CHW/24 and 225/4 for HS2 maintenance access will not give rise to new or different significant effects for water resources or flood risk during operation and will not change the level of significance of the effects reported in the main ES.

Mitigation and residual effects

- 5.8.72 The draft CoCP sets out the measures and standards of work that will be applied to the construction of the AP2 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.
- 5.8.73 Generic examples of design and management measures that will mitigate impacts so that there will be no significant adverse effects on the quality and flow characteristics of surface watercourses and groundwater bodies during operation of the AP2 revised scheme are described in the main ES Volume 1, Section 9 and in the draft operation and maintenance plan for water resources and flood risk included in Volume 5 Appendix WR-001-000 of the main ES.
- 5.8.74 The widening of bridleways CHW/24 and 225/4 for HS2 maintenance access will not give rise to new or different significant residual effects for water resources or flood risk during operation and will not change the level of significance of the effects reported in the main ES.

Cumulative effects

- 5.8.75 There are no new or different likely significant cumulative effects for water resources or flood risk as a result of the amendment acting in combination with another

amendment in AP2 or in AP1, or as a result of any relevant committed development interacting with the AP2 revised scheme.

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

- 5.9.1 The widening of bridleways CHW/24 and 225/4 does not change the significance of the environmental effects or proposed mitigation as set out in the main ES (Volume 2, CFA13, Calvert, Steeple Claydon, Twyford and Chetwode).

5.10 Revised location for wetland habitat creation at Moat Farm, Godington (AP2-013-007)

- 5.10.1 The Bill provides for approximately 3ha of farm land to be permanently used for ecological mitigation at Moat Farm in Godington. The area would have been east of the HS2 route and used for wetland habitat creation (refer to maps CT-05-058 and CT-06-058 in main ES Volume 2, CFA13 Map Book).
- 5.10.2 Since submission of the Bill, an alternative location that is less viable for farming once the scheme is constructed has been identified for the wetland habitat. The ecological mitigation will be relocated to an area of land between the HS2 route and the disused GCML railway. The land is adjacent to the HS2 route where it is crossed by Padbury Brook - there will be no works affecting the banks of the brook (refer to maps CT-05-058 and CT-06-058 in the SES and AP2 ES Volume 2, CFA13 Map Book).
- 5.10.3 The estimated duration of construction is one month, which is the same as the original scheme. The area of land required for the ecological mitigation is similar in size to the area in the original scheme. This land will be required permanently and is outside of the limits of the Bill.
- 5.10.4 The relocation of ecological mitigation is 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: air quality; community; land quality; landscape and visual assessment; socio-economics; sound, noise and vibration; and traffic and transport. However there were changes where reassessment was considered to be required in respect of: agriculture, forestry and soils; cultural heritage; ecology; and water resources and flood risk assessment.

Agriculture, forestry and soils

Scope, assumptions and limitations

- 5.10.5 The assessment scope, key assumptions and limitations for agriculture, forestry and soils 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.

Existing baseline

- 5.10.6 The land affected by the original scheme has soil types in the Denchworth association, as described in the main ES (main ES, Volume 2, CFA13, Section 3.3). These soils are characterised by stoneless, clayey, wet and poorly drained soils of Wetness Class (WC) IV, which are classified as moderate quality agricultural land in Subgrade 3b, i.e. it is not of the best and most versatile (BMV) agricultural quality.

- 5.10.7 Two holdings will be affected by the amendment: Moat Farm (main ES reference CFA13/11), which is an arable farm, extending to approximately 226ha; and Casemore Farm (CFA13/9) which extends to some 113ha and is managed with arable crops and sheep.

Future baseline

Construction (2017)

- 5.10.8 The future baseline for construction in 2017 remains unchanged from that reported in the main ES (Volume 2, CFA13, Section 3.3).
- 5.10.9 Most existing environmental stewardship agreements will expire in 2015 and be replaced by a new environmental land management scheme (countryside stewardship) which is voluntary but competitive. It is more targeted than previous schemes, with its priorities being to protect and enhance biodiversity and water quality.
- 5.10.10 The widespread basic environmental management associated with entry level stewardship will be replaced by a new concept of greening introduced by Common Agricultural Policy reform, which will now be the main means by which farmers will provide environmental benefits in return for their direct support payments. Greening will encourage the retention of permanent grasslands, greater crop diversification and the creation of Ecological Focus Areas. These changes will affect the detailed management of individual farm holdings but are not expected to change fundamentally the baseline circumstances described.

Operation (2026)

- 5.10.11 The future baseline for operation in 2026 remains unchanged from that reported in the main ES (Volume 2, CFA13, Section 3.3).

Effects arising during construction

- 5.10.12 The proposed wetland habitat creation will not substantially alter the area of land that will require a change of use from agriculture to habitat creation, but it will alter the areas of land removed from the individual holdings affected.
- 5.10.13 In terms of the impact on BMV agricultural land, although the land required for the ecological mitigation comprises soils in the Fladbury 1 association, these are still assessed as Subgrade 3b, which is not BMV land. This amendment will not alter the moderate adverse, significant effect on BMV land reported in the main ES.
- 5.10.14 The permanent effect of the original scheme on Moat Farm was assessed as moderate adverse, which is significant, due to the proportion of the holding removed and severance. The amendment will reduce the amount of land permanently required at Moat Farm from 21.6ha (which represents 10% of the holding) to 19.96ha (which represents 9% of the holding) and reduces the impact arising from land loss from medium impact to low impact. The reduction in impact magnitude is not considered to give rise to a different effect. Severance remains as reported in the main ES therefore the residual significant effect on Moat Farm remains moderate adverse.
- 5.10.15 The permanent effect of the original scheme on Casemore Farm was assessed as negligible. This amendment will increase the area of land required from Casemore

Farm to 5.9ha which increases the impact of land required from negligible to low and the overall effect on Casemore Farm to minor adverse, which is not significant and does not alter the effects reported in the main ES.

Effects arising from operation

- 5.10.16 The relocation of the ecological mitigation will not give rise to a new or different significant effect arising from the operation of the scheme and will not change the level of significance of the effects reported in the main ES.

Mitigation and residual effects

- 5.10.17 Land required temporarily for construction will be restored to its former agricultural use once the works are completed. The soil handling will involve stripping, storing and reinstating topsoils on land required for the temporary works, following best practice guidance for handling soil set out in the draft CoCP.
- 5.10.18 The amendment will reduce the amount of land permanently required at Moat Farm. However the effect of severance remains as reported in the main ES and therefore the level of significance remains as moderate adverse.

Cumulative effects

- 5.10.19 There are no new or different likely significant cumulative effects for agriculture, forestry and soils as a result of the amendment acting in combination with another amendment in AP2, or as a result of any relevant committed development interacting with the AP2 revised scheme.

Cultural heritage

Scope, assumptions and limitations

- 5.10.20 The assessment scope, key assumptions and limitations for cultural heritage are set out in Volume 1, the SMR (Volume 5: Appendix CT001-000/01) and the SMR Addendum (Volume 5: Appendix CT-001-000/2) of the main ES.

Existing baseline

- 5.10.21 The cultural heritage baseline for the assessment takes into account information collected in support of the main ES, which included walk-over survey, geophysical survey, remote-sensing data, and data from national and local registers. A full list is provided in Volume 2, Section 6.3 of the main ES. In addition, the baseline has been updated with the results of additional survey work comprising geophysical and walk-over surveys for archaeology. A review of the ancient woodland inventory published by Natural England in 2014 has been carried out to identify woodlands that have been added to the inventory since submission of the main ES.
- 5.10.22 The land required for the amendment does not encroach directly on any designated sites or built heritage assets. Running 550m along the south-western edge of the revised location for the wetland habitat is the disused GCML railway (asset reference CAL018), a heritage asset of low value. Chetwode historic landscape (asset reference CAL127) is a low value heritage asset that lies 250m to the north-west of the amendment. It is an area of well preserved post medieval agricultural landscape, with some surviving medieval elements.

- 5.10.23 The archaeological character of the area is defined as having potential for prehistoric archaeology. Prehistoric enclosures are recorded from cropmarks (asset reference CAL075) 600m south west of the land required for the amendment, and there is general archaeological and geoarchaeological potential owing to the close proximity of Padbury Brook. The agricultural context, alluvial deposits and topography associated with the Padbury Brook, suggests a good preservation of archaeological deposits as the prehistoric ground level may have been protected by later alluvial deposits and is likely to be relatively undisturbed due to agricultural use.

Future baseline

Construction (2017)

- 5.10.24 The future baseline for construction in 2017 remains unchanged from that reported in the main ES (Volume 2, CFA13, Section 6.3).

Operation (2026)

- 5.10.25 The future baseline for operation in 2026 remains unchanged from that reported in the main ES (Volume 2, CFA13, Section 6.3).

Effects arising during construction

- 5.10.26 The original scheme resulted in the loss of a very small area of the Chetwode historic landscape (asset reference CAL127), which was set out as a medium adverse impact and minor adverse effect in the main ES. This loss will no longer occur; however, due to the overall amount of the Chetwode historic landscape that will be lost through construction of the AP2 revised scheme, this amendment will not change the significance of effects reported in the main ES.
- 5.10.27 The proposed wetland habitat creation 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.

Effects arising from operation

- 5.10.28 There will be no further impact on heritage assets arising from the operation of the AP2 revised scheme from that set out in the main ES. The proposed wetland habitat creation 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

- 5.10.29 No additional mitigation measures are required. The amendment will result in no change in the likely residual significant effects reported in the main ES.

Cumulative effects

- 5.10.30 There are no new or different likely significant cumulative effects for cultural heritage as a result of the proposed amendment acting in combination with another amendment in AP2, or in AP1, or as a result of any relevant committed development interacting with the AP2 revised scheme.

Ecology

Scope, assumptions and limitations

- 5.10.31 The assessment scope for ecology is as set out in Volume 1 of the SES and AP2 ES. The key assumptions and limitations, and the methodology for determining significance of effects are as set out in Volume 1, the SMR (Volume 5: Appendix CT-001-000/01) and the SMR Addendum (Volume 5: Appendix CT-001-000/02) of the main ES.
- 5.10.32 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 AP2 revised scheme.

Existing baseline

- 5.10.33 The ecological baseline of the land required for the amendment has been based on field data collated for the main ES, aerial photography and relevant existing information gathered from national organisations and from regional and local sources including: Buckinghamshire and Milton Keynes Environmental Records Centre; Berkshire, Buckinghamshire and Oxfordshire Wildlife Trust; Environment Agency; and North Bucks Bat Group.
- 5.10.34 A summary of the baseline information relevant to the assessment of the amendment is provided below. This takes account of any relevant new or updated baseline information provided in SES and AP2 ES Volume 5: Appendix EC-001-002. For those receptors described in the main ES, further details are provided in Volume 2, CFA13, Section 7.3 and in Volume 5, including maps EC-01 to EC-12.

Designated sites

- 5.10.35 There are no statutory or non-statutory designated nature conservation sites or areas of ancient woodland relevant to the assessment. Statutory and non-statutory designated sites are described in the main ES, Volume 2, CFA13, Section 7 and are shown on Maps EC-01-028b to EC-01-031a, Volume 5, Ecology Map Book.

Habitats

- 5.10.36 A section of the Padbury Brook, east of Godington, approximately 55m long, and an associated drainage ditch pass through land required for the amendment. As reported in the main ES, Padbury Brook has been modified and its channel is characteristic of over-deepened rivers. It is the largest watercourse in the area and is a habitat of principal importance and is of district/borough value.
- 5.10.37 A pond directly adjacent to land required for the amendment and immediately south of the Padbury Brook is considered to be part of the wider resource of ponds assessed in the main ES as being of up to district/borough value.
- 5.10.38 Scrub habitat is present along the Padbury Brook and the disused GCML railway, and is relevant to the amendment. As stated in the main ES, this habitat type is common in the wider area and it is therefore of local/parish value.

- 5.10.39 The majority of the land required for the revised location of the wetland habitat is arable. Other habitats present in and adjacent to the land required for the amendment comprise improved grassland and tall ruderal habitat present along the Padbury Brook and the associated drainage ditch. None of these habitats are of greater than local/parish value, as reported in the main ES.
- 5.10.40 Habitats surrounding the land required for the amendment are described in the main ES, Volume 2, CFA13, Section 7 and are shown on Maps EC-02-028b to EC-02-031a, Volume 5, Ecology Map Book.

Protected and/or notable species

- 5.10.41 As reported in the main ES, it is assumed that a metapopulation of great crested newt may be present in ponds north-east of Godington, including a pond located adjacent to the amendment. On a precautionary basis, metapopulations of this species are assumed to be of up to county/metropolitan value.
- 5.10.42 An otter population on the Padbury Brook is relevant to this amendment. Evidence of otter presence was recorded during field surveys for the main ES along the main watercourse east of Godington. The population is of county/metropolitan value.
- 5.10.43 Habitat suitable for reptiles along the Padbury Brook and associated drainage ditch and along the disused GCML railway east of Godington is relevant to this amendment. As part of a precautionary assessment, it is assumed that reptile assemblages present would potentially be of county/metropolitan value.
- 5.10.44 As reported in the main ES, the assemblage of bats that is assumed to be present between Twyford and Chetwode is of district/borough value. Land adjacent to the amendment area includes features, such as scrub and trees along the disused GCML railway and Padbury Brook, which provide suitable habitat for bats.
- 5.10.45 Badger populations recorded utilising land required for the construction of the original scheme are of local/parish value, as stated in the main ES. Given the presence of suitable habitat along the former disused GCML railway adjacent to land required for the revised location of the wetland habitat, badgers may be present.
- 5.10.46 The colonies of notable plant species present on the disused GCML railway are of district/borough value, as stated in the main ES. The section of the disused railway directly adjacent to the amendment area may support these species.
- 5.10.47 Fish and aquatic invertebrate assemblages in the Padbury Brook at Godington are relevant to the amendment. The main ES identified both these assemblages as being of district/borough value.
- 5.10.48 Locations of species records are illustrated in the main ES on Maps EC-01 to EC-12, Volume 5, Ecology Map Book.

Future baseline

Construction (2017)

- 5.10.49 The future baseline for construction in 2017 remains unchanged from that reported in the main ES (Volume 2, CFA13, Section 7.3).

Operation (2026)

- 5.10.50 The future baseline for operation in 2026 remains unchanged from that reported in the main ES (Volume 2, CFA13, Section 7.3).

Effects arising during construction

Avoidance and mitigation measures

- 5.10.51 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.

Designated sites

- 5.10.52 The amendment 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

- 5.10.53 Wetland habitat can be created without adverse effects on the Padbury Book. It is considered unlikely that any effects on habitats of relevance at more than the local/parish level will occur. Additional local/parish level effects arising from survey data collected since the main ES are listed in SES and AP2 ES Volume 5: Appendix EC-002-002.

Species

- 5.10.54 The main ES reports that the loss of a potential breeding pond could result in an adverse effect on the conservation status of the great crested newt metapopulation assumed to be present in ponds north-east of Godington that is significant at up to the county/metropolitan level. Land required for the revised location of the wetland habitat is adjacent to a pond potentially containing a great crested newt population, but no additional ponds or suitable terrestrial habitat will be lost due the amendment. Therefore, the amendment will not give rise to a new or different significant effects and will not change the level of significance of the effects reported in the main ES.
- 5.10.55 The main ES states that there will be no significant adverse effect on the conservation status of the otter population present on Padbury Brook or its tributaries. The wetland habitat creation adjacent to the Padbury Brook will be carried out in accordance with the draft CoCP (Appendix CT-003-000/1). Therefore, the amendment will not give rise to a new or different significant effect and will not change the level of significance of the effects reported in the main ES.
- 5.10.56 It is considered unlikely that any other effects on species of relevance at more than the local/parish level will occur. Additional local/parish level effects arising from survey data collected since the main ES are listed in SES and AP2 ES Volume 5: Appendix EC-002-002.

Cumulative effects

- 5.10.57 There are no new or different likely cumulative effects for ecology as a result of the proposed amendment acting in combination with another amendment in AP2, or in

AP1, as a result of any relevant committed development interacting with the AP2 revised scheme.

Mitigation and residual effects

Other mitigation measures

- 5.10.58 The wetland habitat creation area at the revised location is similar in size and function to the area proposed in the original scheme. No additional mitigation measures (i.e. in addition to those identified in the main ES and SES are required.

Summary of likely residual effects

- 5.10.59 No new or different residual effects on ecological receptors occur as a consequence of the amendment. The significant residual effects of the AP2 revised scheme in this area are therefore unchanged from those reported in the main ES.

Effects arising from operation

- 5.10.60 No new or different effects on ecological receptors occur as a consequence of the amendment.

Water resources and flood risk assessment

Scope, assumptions and limitations

- 5.10.61 The assessment scope, key assumptions and limitations for water resources are as set out in Volume 1, the SMR (Volume 5: Appendix CT-001 -000) and the SMR Addendum (Volume 5: Appendix CT-001-000) of the main ES.
- 5.10.62 The assessment assumes that the proposed ecological mitigation area will not result in ground-level changes within the floodplain that could alter flooding in the area.
- 5.10.63 Detailed hydraulic modelling has been undertaken for the Padbury Brook and its tributaries at Twyford and Godington. The outputs from this model are shown on Maps WR-05-028 to WR-05-031 and WR-06-028 to WR-06-031 (Volume 5, Water Resources and Flood Risk Assessment Map Book) of the main ES. The limitations associated with flood risk within this study area are described in detail in the Volume 5: Appendix WR-003-013 of the main ES.
- 5.10.64 The assessment considers the potential impact of the proposed ecological mitigation pond and drainage on surface water receptors and flood risk. Specifically, the effect of the wetland habitat creation area within the floodplain of the Padbury Brook is considered.

Existing baseline

- 5.10.65 The baseline water resources and flood risk information for the Calvert, Steeple Claydon, Twyford and Chetwode area is described in the main ES (Volume 2, CFA Report 13, Section 13).
- 5.10.66 WFD surveys covering hydromorphological and ecological walk-overs have been undertaken in this CFA since submission of the main ES. These surveys were carried out on the Twin and the Padbury Brook (The Twins) water bodies. Details of all survey work undertaken in this CFA since September 2013 is provided in Volume 5: Appendix WR-001-000 (Annex A Surface Water).

- 5.10.67 The proposed ecological mitigation areas are located to the north-west and south-east of the Padbury Brook (the Twins). The Padbury Brook is an ordinary watercourse which has the current overall status¹¹, under the WFD, of Moderate Potential. The objective for 2015 is Good Potential. The mitigation areas will also be located on either side of an unnamed tributary of the Padbury Brook. This tributary is an ordinary watercourse and is assumed to be Moderate Potential with the objective of Good Potential by 2015.
- 5.10.68 The site is underlain by the Lower Oxford Clay, classified as unproductive strata and therefore not assessed under WFD. The bedrock is overlain by superficial deposits (Alluvium in the valley of the Padbury Brook and River Terrace Deposits to the west). These superficial deposits are classified as Secondary A aquifers and are likely to be in hydraulic connection with the local surface watercourses.
- 5.10.69 The proposed ecological mitigation is located in the floodplain of the Padbury Brook between the disused GCML railway and the HS2 route. The baseline modelling of the original scheme shows shallow flow parallel to the HS2 route on the south-western side; however, the majority of flood flow passes along the natural valley through the proposed viaduct.
- 5.10.70 Land use in the floodplain in the vicinity of the amendment is arable farm land and pasture (moderate value receptor), together with a residential property, Moat Farm at Godington (high value receptor).
- 5.10.71 The Buckinghamshire PFRA identifies that a significant proportion of the land (more than 75%) at the Padbury Brook is susceptible to groundwater emergence. The Oxfordshire PFRA identifies that a significant proportion of the land at Godington (more than 75%) is susceptible to groundwater emergence. The SFRA reports do not identify any specific groundwater flood risks in the study area. The risk of groundwater emergence is likely to be closely linked to water levels in the Padbury Brook.
- 5.10.72 An area is shown on the Environment Agency reservoir inundation map that has a risk of flooding associated with a failure of Tusmore Park Lake. The modelled flow paths from this water body follow the course of the Padbury Brook and its floodplain. Although there is the potential to affect the extent and depth of residual risk of flooding from Tusmore Park Lake by way of works within the mapped flood extent, the likelihood of such flooding is extremely low and is therefore not considered further in this assessment.

Future baseline

Construction (2017)

- 5.10.73 The future baseline for construction in 2017 remains unchanged from that reported in the main ES (Volume 2, CFA13, Section 13.3).

Operation (2026)

- 5.10.74 The future baseline for operation in 2026 remains unchanged from that reported in the main ES (Volume 2, CFA13, Section 13.3).

¹¹ Environment Agency (2009) River Basin Management Plan, Thames River Basin District

Effects arising during construction

- 5.10.75 Wetland habitat will be created in this area including some small lined ponds. Superficial deposits that may contain shallow groundwater are present in the catchment of the Padbury Brook. The superficial deposits are likely to be in hydraulic connectivity with the local watercourses. There is the potential that construction could impact on the flow of groundwater in these deposits, but given the limited depth and scale of the proposed ponds, the impact will be negligible resulting in a neutral effect that will not be significant.
- 5.10.76 The wetland habitat, including some small lined ponds, will be constructed using best practice as described in Section 16 of the draft CoCP, to ensure no contamination occurs to groundwater or connected surface water bodies. The impact of the amendment will be negligible impact resulting in a neutral effect that will not be significant.
- 5.10.77 The assessment assumes that there will be no significant ground-level alterations as part of the wetland habitat creation that would alter the mechanisms of flooding from the Padbury Brook. Consequently, there are no new or different construction effects for flood risk as a result of the amendment, in comparison with the main ES.

Effects arising from operation

- 5.10.78 There are no new or different operational effects for water resources or flood risk as a result of the amendment, in comparison with the main ES.

Mitigation and residual effects

- 5.10.79 The draft CoCP sets out the measures and standards of work that will be applied to the construction of the AP2 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.
- 5.10.80 Generic design measures will be implemented to avoid significant adverse effects on the quality and flow characteristics of surface water courses, groundwater bodies and flood risk. These are described in Volume 1, Section 9 of the main ES and in the draft operation and maintenance plan for water resources and flood risk included in Volume 5, Appendix WR-001-000 of the main ES.
- 5.10.81 No other mitigation measures are envisaged for surface water, groundwater or reducing flood risk.
- 5.10.82 There are no new or different likely residual significant effects for water resources or flood risk as a result of amendment, in comparison with the main ES and the AP1 ES.

Cumulative effects

- 5.10.83 There are no new or different likely residual significant effects for water resources and flood risk as a result of the proposed amendment acting in combination with another amendment in AP2, or as a result of any relevant committed development interacting with the AP2 revised scheme.

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

- 5.11.1 The revised location for wetland habitat creation at Moat Farm does not change the significance of the environmental effects or proposed mitigation as set out in the main ES (Volume 2, CFA13, Calvert, Steeple Claydon, Twyford and Chetwode).

5.12 School End temporary realignment at Chetwode (AP2-013-008)

- 5.12.1 The Bill provides for the temporary closure of School End (a road) at Chetwode with traffic using it temporarily diverted via the A4421, a distance of about 7km. The diversion would have been in place for a period of between one year and one year and six months during construction of School End overbridge (refer to maps CT-05-059 in main ES Volume 2, CFA13 Map Book).
- 5.12.2 Since submission of the Bill a temporary realignment of School End has been identified immediately to the north of the proposed School End overbridge. The temporary realignment will cross the HS2 route at existing ground level and allow the road to remain open during construction of School End overbridge. School End will then be permanently aligned along its original route, as was also proposed in the original scheme (refer to AP2 map CT-05-059 in the SES and AP2 ES Volume 2, CFA 13 Map Book).
- 5.12.3 The estimated duration for construction of the temporary alignment is four months, which is additional to the one year and three months required for the overbridge construction in the original scheme. The land required for the temporary realignment will be 0.6ha, which is outside the Bill limits. The land will be required for the duration of School End overbridge construction.
- 5.12.4 The temporary realignment of School End is 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; land quality; landscape and visual assessment; socio-economics; and, water resources and flood risk assessment. However there were changes where reassessment was considered to be required in respect of: cultural heritage; ecology; sound, noise and vibration; and, traffic and transport.

Cultural heritage

Scope, assumptions and limitations

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

Existing baseline

- 5.12.6 The cultural heritage baseline for the assessment takes into account information collected in support of the main ES, which included walk-over survey, geophysical survey, remote-sensing data, and data from national and local registers. A full list is provided in Volume 2, Section 6.3 of the main ES. In addition, the baseline has been updated with the results of additional survey work comprising geophysical and walk-

over surveys for archaeology. A review of the ancient woodland inventory published by Natural England in 2014 has been carried out to identify woodlands that have been added to the inventory since submission of the main ES.

- 5.12.7 The new land required for the amendment does not encroach on any designated sites or built heritage assets. Running adjacent to the new land required on the south-eastern edge is the Chetwode historic landscape (asset reference CAL127), an asset of moderate heritage value. Approximately 30m east of the amendment is the school at School End (asset reference CAL104) now converted to a house, and 50m to the east is the disused GCML railway; both are of low heritage value.
- 5.12.8 In the wider landscape, Chetwode Conservation Area is 440m to the east of the amendment; it contains one Grade I listed building and two Grade II listed buildings and is of high heritage value. There is a moated site (asset reference CAL095) 410m from the amendment with another larger moated site (asset reference CAL096) 375m from the amendment, both south-east of the new land required. Approximately 500m to the south of the amendment is the Hermitage (asset reference CAL093), a Grade II listed building with a moat (asset reference CAL094), both being of moderate heritage value. These assets indicate a potential for associated archaeological remains dating to the medieval and early medieval period.

Future baseline

Construction (2017)

- 5.12.9 The future baseline for construction in 2017 remains unchanged from that reported in the main ES (Volume 2, CFA13, Section 6.3).

Operation (2026)

- 5.12.10 The future baseline for operation in 2026 remains unchanged from that reported in the main ES (Volume 2, CFA13, Section 6.3).

Effects arising during construction

- 5.12.11 The main ES assessed the original scheme as having a medium adverse impact and moderate adverse effect on three heritage assets, the Hermitage (asset reference CAL093) and associated moat (asset reference CAL094) and the school at School End (asset reference CAL104). The temporary realignment of School End does not change the results of this assessment as set out in the main ES with respect to cultural heritage, as it does not encroach onto any of the heritage assets previously identified or alter their settings.
- 5.12.12 The proposed temporary road realignment 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.

Effects arising from operation

- 5.12.13 The temporary realignment of School End 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

- 5.12.14 No additional mitigation measures are required. The amendment will result in no change in the likely residual significant effects reported in the main ES.

Cumulative effects

- 5.12.15 There are no new or different likely significant cumulative effects for cultural heritage as a result of the proposed amendment acting in combination with another amendment in AP2, or as a result of any relevant committed development interacting with the AP2 revised scheme.

Ecology

Scope, assumptions and limitations

- 5.12.16 The assessment scope for ecology is as set out in Volume 1 of the SES and AP2 ES. The key assumptions and limitations, and the methodology for determining significance of effects are as set out in Volume 1, the SMR (Volume 5: Appendix CT-001-000/01) and the SMR Addendum (Volume 5: Appendix CT-001-000/02) of the main ES.
- 5.12.17 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 AP2 revised scheme.

Existing baseline

- 5.12.18 The ecological baseline of the land required for the amendment has been based on field data collated for the main ES, additional survey work for bats and great crested newt undertaken after publication of the main ES, aerial photography and relevant existing information gathered from national organisations and from regional and local sources including: Buckinghamshire and Milton Keynes Environmental Records Centre; Berkshire, Buckinghamshire and Oxfordshire Wildlife Trust; Environment Agency; and North Bucks Bat Group.
- 5.12.19 In addition, the Water Framework Directive assessment has been updated. Details of the revised assessment are presented in Volume 5: Appendix WR-001-000.
- 5.12.20 A summary of the baseline information relevant to the assessment of the amendment is provided below. This takes account of any relevant new or updated baseline information provided in the SES and AP2 ES Volume 5: Appendix EC-001-002. For those receptors described in the main ES, further details are provided in the main ES Volume 2, CFA13, Section 7.3 and in Volume 5, including Maps EC-01 to EC-12, Ecology Map Book.

Designated sites

- 5.12.21 There are no statutory designated nature conservation sites or areas of ancient woodland relevant to the assessment.
- 5.12.22 One non-statutory Local Wildlife Site (LWS) is relevant to the amendment. This is Barton Hartshorn Railway Wood LWS, which is approximately 400m north-west of

land required for the amendment. It is designated for remnant fen, wet woodland and wet grassland habitats. The LWS is of county/metropolitan value.

- 5.12.23 Statutory and non-statutory designated sites are described in the main ES, Volume 2, CFA13, Section 7 and are shown on Map EC-01-31a, Volume 2, Ecology Map Book.

Habitats

- 5.12.24 Broadleaved woodland along the disused GCML railway near Chetwode is within the land required for this amendment. The woodland is not a habitat of principal importance and as stated in the main ES woodlands of similar size are widespread locally. Each of these woodland stands is therefore of local/parish value.
- 5.12.25 Important hedgerows are present on land required for this amendment; it is assumed that further important hedgerows will be found on land that was not surveyed as access was not available. The hedgerows form part of the same hedgerow network reported in the main ES as being of district/borough value.
- 5.12.26 The majority of the land required for this amendment is arable farmland and improved grassland. Other habitats present are semi-improved grassland and dense scrub. As reported in the main ES these habitat receptors are each of up to local/parish value.
- 5.12.27 Habitats surrounding the land required for the amendment are described in the main ES, Volume 2, CFA13, Section 7 and are shown on are shown on Maps EC-02-028b to EC-02-031a, Volume 5, Ecology Map.

Protected and/or notable species

- 5.12.28 The assemblage of bats, which is assumed in the main ES to be present near Barton Hartshorn and associated with the GCML near Chetwode, is of county/metropolitan value and is relevant to this amendment. The land required for the amendment includes hedges, scrub and woodland along the disused GCML railway and where the temporary realignment meets School End. These provide suitable habitat for bats and may be utilised by the bat assemblage.
- 5.12.29 The main ES states that the assemblage of terrestrial invertebrates recorded near Barton Hartshorn and the disused GCML railway, which will be crossed by the amendment, is of county/metropolitan value.
- 5.12.30 As reported in the main ES, large and medium populations of grass snake of county/metropolitan value are present on either side of the original scheme in the vicinity of School End. The land required for the temporary road diversion includes the land that may be utilised by these populations.
- 5.12.31 Colonies of notable plant species present on the disused GCML railway are identified in the main ES as being of district/ borough value. Species present include dwarf spurge and sainfoin, two near-threatened plant species that are restricted in their distribution.
- 5.12.32 Surveys identified one badger territory in the vicinity of the amendment that is likely to be associated with the social groups reported in the main ES. Badger social groups in the vicinity of land required for the construction of the original scheme were identified in the main ES as being of local/parish value.

- 5.12.33 Locations of species records are illustrated in the main ES on Maps EC-01 to EC-12, Volume 5, Ecology Map Book.

Future baseline

Construction (2017)

- 5.12.34 The future baseline for construction in 2017 remains unchanged from that reported in the main ES (Volume 2, CFA13, Section 7.3).

Operation (2026)

- 5.12.35 The future baseline for operation in 2026 remains unchanged from that reported in the main ES (Volume 2, CFA13, Section 7.3).

Effects arising during construction

Avoidance and mitigation measures

- 5.12.36 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.

Designated sites

- 5.12.37 The amendment 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

- 5.12.38 Hedgerows within land required for the amendment are part of the hedgerow network in the wider landscape. The hedgerow losses and severance due to the original scheme was reported in the main ES as an adverse effect at the district/borough level. Vegetation clearance required for the construction of a temporary realignment of School End would result in the additional removal of approximately 180m of hedgerow which may qualify as important hedgerow (under the Hedgerows Regulations 1997). This is a different significant effect to that reported in the main ES. However, there will be no change in the significance level of the effects reported in the main ES.
- 5.12.39 The main ES concludes that adverse effects are unlikely at more than the local/parish level on habitat receptors such as dense scrub, semi-improved grassland, arable land and woodland that is not classified as a habitat of principal importance. The extent of habitat loss due to vegetation clearance within land required for the construction of the temporary road realignment is unlikely to change the significance of effects reported for these receptors in the main ES.

Species

- 5.12.40 The main ES reports that habitat loss and fragmentation required for the construction of the Chetwode cutting (crossed by School End overbridge) will result in loss and disturbance of bat roosts, as well as fragmentation of bat flight lines, that gives rise to an adverse effect on the bat assemblage significant at the county/metropolitan level. The removal of an additional 180m of hedgerow habitat due to the amendment could

result in the loss of additional roosts. It will also increase the extent of habitat fragmentation potentially affecting the bat assemblage that is assumed to be present in the vicinity of the amendment. This represents a different significant effect to that reported in the main ES. However, given that a significant effect on conservation status at the county/metropolitan level is already expected there will be no change to the level of significance of effects on bats reported in the main ES.

5.12.41 The original scheme will remove habitat in the vicinity of School End that would result in a significant adverse effect on the conservation status of grass snake in the area at county/metropolitan level. Small areas of scrub and semi-improved grassland potentially suitable for reptiles will be removed within the 0.6ha of land required for the amendment. This represents a different significant effect to that reported in the main ES, however the extent of loss and fragmentation is unlikely to change the significance of effects on reptiles reported in the main ES.

5.12.42 It is unlikely that the amendment will result in any other (use as appropriate) new or different effects on species receptors of relevance at more than the local/parish level. Additional local/parish level effects (i.e. in addition to those identified in the main ES) arising from the AP2 revised scheme in this area are listed in Volume 5: Appendix EC-002-002 of the SES and AP2 ES.

Cumulative effects

5.12.43 There are no new or different likely cumulative effects for ecology as a result of the proposed amendment acting in combination with another amendment in AP2, or in AP1, as a result of any relevant committed development interacting with the AP2 revised scheme.

Mitigation and residual effects

Other mitigation measures

5.12.44 In line with the measures set out in the main ES, replacement hedgerow planting will connect to existing habitat within the landscape to compensate for the losses of wildlife corridors that hedgerows provide. The hedgerow replanting will be undertaken in accordance with the ecological principles of mitigation (main ES Volume 5: Appendix CT-001-000/2). No additional mitigation measures (i.e. in addition to those identified in the main ES and SES) are required.

5.12.45 No additional mitigation measures (i.e. in addition to those identified in the main ES and SES) are required.

Summary of likely residual effects

5.12.46 No new or different residual effects on ecological receptors occur as a consequence of the amendment. The significant residual effects of the AP2 revised scheme in this area are therefore unchanged from those reported in the main ES.

Effects arising from operation

5.12.47 There are no new or different significant cumulative effects on ecological receptors during operation.

Sound, noise and vibration

Scope, assumptions and limitations

- 5.12.48 The assessment scope, key assumptions and limitations for sound, noise and vibration 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.
- 5.12.49 Local assumptions and limitations for sound, noise and vibration are set out in Volume 2, CFA13 Report, Section 11 of the main ES.

Existing baseline

- 5.12.50 The baseline sound, noise and vibration information for Calvert, Steeple Claydon, Twyford and Chetwode is described in the main ES (Volume 2, CFA13, Section 11).

Future baseline

Construction (2017)

- 5.12.51 The future baseline for construction in 2017 remains unchanged from that reported in the main ES (Volume 2, CFA13, Section 11.2).

Operation (2026)

- 5.12.52 The future baseline for operation in 2026 remains unchanged from that reported in the main ES (Volume 2, CFA13, Section 11.2).

Effects arising during construction

- 5.12.53 The nearest sensitive residential receptors to the works are dwellings in School End represented by assessment location 274609, (see Volume 5 appendices SV-002-013, SV-003-013 and SV-03 maps of the main ES). The activities resulting in the highest forecast noise levels at these receptors are works associated with construction of the School End overbridge. The main ES reported that the mitigation measures reduce the effects of outdoor construction noise on the acoustic character around the local residential communities in this area such that the adverse effects identified are considered to be not significant.
- 5.12.54 The works associated with the temporary realignment of School End do not represent a substantial intensification of the works reported in the main ES and therefore noise levels at the sensitive receptors are not forecast to change substantially. The outcomes of the assessment reported in the main ES therefore remain unchanged.
- 5.12.55 There are no new or different construction effects for sound, noise and vibration as a result of the amendment, in comparison with the main ES and the SES.

Effects arising from operation

- 5.12.56 There are no new or different significant operational effects for sound, noise and vibration as a result of the amendment, in comparison with the main ES and the AP1 ES.

Mitigation and residual effects

- 5.12.57 No additional mitigation measures are required. The amendment will result in no change in the likely residual significant effects reported in the main ES.

Cumulative effects

- 5.12.58 There are no new or different likely cumulative effects for sound, noise and vibration as a result of the proposed amendment acting in combination with another amendment in AP2, or in AP1, as a result of any relevant committed development interacting with the AP2 revised scheme.

Traffic and transport

Scope, assumptions and limitations

- 5.12.59 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.

Existing baseline

- 5.12.60 The environmental baseline for traffic and transport is set out in Volume 2, CFA13, Section 12 of the main ES. There is no change to the existing baseline as reported in the main ES.

Future baseline

Construction

- 5.12.61 The future baseline for construction remains unchanged from that reported in the main ES (Volume 2, CFA13, Section 12.3).

Operation (2026 and 2041)

- 5.12.62 The future baselines for operation in 2026 and 2041 remain unchanged from those reported in the main ES (Volume 2, CFA13, Section 12.3).

Effects arising during construction

- 5.12.63 The temporary realignment of School End removes the requirement for traffic to divert along alternative routes. This will result in the removal of two significant effects shown on Map Series TR-03-57 (SES and AP2 Volume 5, Traffic and Transport Map Book):
- School End - reported in the main ES as a major adverse effect in relation to required diversion and increased travel distance for all users; and
 - Manor Farm Lane - reported in the main ES as a moderate adverse effect in relation to traffic related severance for non-motorised users.
- 5.12.64 The amendment will also result in a change in traffic flows on the A4421, between Manor Farm Lane and Watergate Farm Lane in CFA14 due to the removal of traffic that was diverted under the original scheme. This does not, however, change the level of significance or result in different effects on this road compared to the reporting in the ES.

Effects arising from operation

- 5.12.65 There are no changes in operation and consequently no new or different likely residual significant effects arising from operation compared to those reported in Volume 2, CFA13, Section 12 of the main ES.

Mitigation and residual effects

- 5.12.66 No changes to the mitigation described in the main ES (Volume 2 CFA13, Chapter 12) are required.
- 5.12.67 There are two changes to the likely residual effects during construction as reported in the main ES with two adverse significant effects removed: the major effect in relation to increased travel distance for all road users of School End; and in relation to the moderate effect of traffic related severance for non-motorised users of Manor Farm Lane.

Cumulative effects

- 5.12.68 Cumulative effects are reported in Volume 2, CFA13, Section 12 of the main ES. The above assessment has taken into account these cumulative effects, including planned development by taking account of background traffic growth, as well as traffic and transport impacts of works being undertaken in other areas.

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

- 5.13.1 The temporary realignment of School End during construction removes two significant adverse residual effects reported in the main ES on: increased travel distance for all road users of School End; and, traffic related severance for non-motorised users on Manor Farm Lane.
- 5.13.2 The amendment does not change the significance of other environmental effects or proposed other mitigation from that set out in the main ES (Volume 2, CFA13, Calvert, Steeple Claydon, Twyford and Chetwode).

5.14 Minor works to upgrade an access track in Barton Hill Farm (AP2-013-009)

- 5.14.1 The Bill provides for an access track that will allow maintenance access to balancing ponds serving railway drainage. It runs northwards from School End (a road), parallel to the HS2 route about 350m north-east of Barton Hill Farm. The access track would have gone around the south and west sides of an existing pond adjacent to the HS2 route. This route would have prevented the landowner from accessing the farm pond to undertake maintenance (refer to maps CT-05-060a and CT-06-060a in main ES Volume 2, CFA13 Map Book).
- 5.14.2 The amendment seeks a change of powers to enable realignment of the access track around the north and east sides of the farm pond – access to the pond for maintenance will now be possible with this revised route. No additional land is required.

- 5.14.3 The minor works to upgrade the access track 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 any environmental topic.

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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