HIGH SPEED RAIL (LONDON - WEST MIDLANDS)

Supplementary Environmental Statement 3 and Additional Provision 4 Environmental Statement

Volume 2 | Community forum area reports

CFA19 Coleshill Junction

October 2015

SES3 and AP4 ES 3.2.1.19

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Department for Transport

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Contents

List of figures

List of tables

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

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

- non-technical summary (NTS). This provides a summary in non-technical language of the SES3 (Part 1) and AP4 ES (Part 2) and of any likely significant environmental effects, both beneficial and adverse, which are new or different to those reported in the High Speed 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') as updated by subsequent SES and AP ES documents;
- Volume 1: introduction to the SES3 and AP4 ES. This introduces the supplementary environmental information and design changes included within the SES3 and amendments, which have resulted in the need to amend the Bill, within the AP4 ES. It also explains any changes to the scope, methodology, assumptions and limitations required for the environmental assessment;
- Volume 2: community forum area (CFA) reports and map books. These describe the supplementary environmental information and design changes included within the SES3 (Part 1) and amendments within the AP4 ES (Part 2). Any new or different likely significant environmental effects arising from these changes and amendments in each CFA, compared to those reported in the main ES, as updated by SES and SES2 documents (and SES3 for the AP4 amendments) are reported. The AP1, AP2 and AP3 amendments are also taken into account where relevant. In addition, the main local alternatives that have been considered are described, where relevant;
- Volume 3: route-wide effects. This reports new or different likely significant route-wide effects arising from the supplementary environmental information and design changes included within the SES3 (Part 1) and amendments within the AP4 ES (Part 2) compared to those reported in the main ES as updated by SES and SES2 (and SES3 for the AP4 amendments). The AP1, AP2 and AP3 amendments are also taken into account where relevant;
- Volume 4: off-route effects. This reports new or different likely significant off-route effects arising from the supplementary environmental information and design changes included within the SES3 (Part 1) and amendments within the AP4 ES (Part 2) compared to those reported in the main ES as updated by SES and SES2 (and SES3 for the AP4 amendments). The AP1, AP2 and AP3 amendments are also taken into account where relevant;

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

Structure of this report

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

Part 1 of this CFA report provides supplementary environmental information relating to:

- new baseline information with respect to ecological surveys conducted during 2015;
- new baseline information for the Highway Point building;
- changes to the design or construction assumptions which do not require changes to the Bill; and
- corrections to the main ES or subsequent SES or AP ES documents.

Part 1 of this CFA report includes, where relevant:

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

Part 2 of the CFA report provides environmental assessment information relating to proposed amendments to the design, which have resulted in the need to alter the powers conferred by the Bill. The following is included where relevant:

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

  - effects arising from operation; and
  - mitigation and residual effects; 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) in CFAs 7 – 26. The SES and AP2 ES which was submitted in July 2015, updated the main ES and contained a number of further amendments to the design of the original scheme in CFAs 4 – 26. The SES2 and AP3 ES which was submitted in September 2015, contained further updates to the main ES and reported the assessment of a number of amendments to the design of the original scheme in CFAs 1 – 5.

1.1.2 Since the submission of the main ES and subsequent SES and AP documents, updates to environmental baseline information and changes to scheme design or assumptions have occurred, which may lead to new or different significant effects. These effects, depending on the type of change, are reported in the SES3 (Part 1) or AP4 ES (Part 2) of this document, where they occur.

1.1.3 The Bill and associated Additional Provisions (APs) to the Bill described above, if enacted by Parliament, will provide the powers to construct, operate and maintain Phase One of HS2.

1.1.4 In order to differentiate between the original scheme and the subsequent changes, the terms set out in Table 1 are used.

Table 1: Scheme definitions

Scheme name	Definition	Relevant CFAs
the original scheme	the Bill scheme submitted to Parliament in November 2013, which was assessed in the main ES	1 – 26
the AP1 revised scheme	the original scheme as amended by the AP submitted in September 2014	7 – 26
the SES scheme	the original scheme with the design changes described in the SES submitted in July 2015	4 – 26
the AP2 revised scheme	the SES scheme as amended by the AP2 submitted in July 2015	4 – 26
the SES2 scheme	the original scheme as updated by the SES scheme, with the design changes described in the SES2 submitted in September 2015	1 – 5 (i.e. this applies in the London area only)
the AP3 revised scheme	the SES2 scheme as amended by the AP3 submitted in September 2015	1 – 5 (i.e. this applies in the London area only)
the SES3 scheme	the SES2 scheme with the design changes described in the SES3 submitted in October 2015	4 – 26
the AP4 revised scheme	the SES3 scheme as amended by the AP4 submitted in October 2015	4 – 26

1.1.5 SES3 (Part 1 of this report) contains updated environmental baseline information and describes changes to the scheme that have occurred within the current limits and powers of the Bill, and therefore do not require an AP to the Bill. This includes:

- new baseline information with respect to ecological surveys conducted during 2015;
- new baseline information for the Highway Point building;
- changes to the design or to construction assumptions which do not require changes to the Bill; and
- corrections to the main ES or subsequent SES or AP ES documents.

1.1.6 Design changes assessed within the SES3 for this CFA include:

- additional landscape earthworks and relocation of Gilson auto-transformer station; and
- temporary improvements to the junction between the A446 Stonebridge Road and B4114 Birmingham Road to the west of Coleshill.

1.1.7 The changes are described in Part 1 under a series of sub-headings, and assessed on a topic by topic basis using the same approach adopted in the main ES.

1.1.8 The purpose of SES3 is to provide an assessment of any new or different likely significant environmental effects arising from the changes described.

1.1.9 There were no SES2 changes in this CFA, so the SES3 changes are compared to the SES scheme. There were AP1 and AP2 amendments, so these are taken into account as appropriate.

1.1.10 The AP4 ES (Part 2 of this report) describes the likely significant effects of amendments to the design of the scheme, which require the use of land outside the original limits of the Bill, additional access rights, or other extensions to the powers conferred by the Bill, making it necessary to submit an AP to the Bill. The amendments assessed within the AP4 ES for this CFA include:

- changes within the Chattle Hill area to reduce impact on local businesses, provide passive provision for potential future widening of the A446, change utility diversions to facilitate construction, reduce railway maintenance requirements and mitigate impacts on the Coleshill Sludge Lagoons Local Wildlife Site (LWS);
- relocation of Water Orton Primary School; and
- temporary improvements to the junction of the A446 Lichfield Road and B4118 Marsh Lane to the East of Water Orton.

1.1.11 The AP4 ES assesses each amendment separately for all relevant topics. The purpose of the AP4 ES is to provide an assessment of any new or different likely significant environmental effects arising from the amendments compared to the SES3 scheme, taking into account AP1, and AP2 amendments where relevant.

1.1.12 The standard measures that will be used to mitigate likely significant adverse environmental effects during construction and operation of the scheme are described in the main ES, Volume 1, Section 9 and the draft Code of Construction Practice (CoCP) submitted in support of the Bill. Implementation of these measures has been assumed in this SES3 and AP4 ES.

Part 1: Supplementary Environmental Statement 3

2 Summary of changes

2.1 New environmental baseline information

Ecology

2.1.1 Details of all amphibian surveys undertaken in this area during 2015 are provided in SES3 and AP4 ES Volume 5: Appendix EC-001-003 and Volume 5 map series: EC-04.

2.1.2 The additional baseline data does not generate any new or different significant effects and therefore is not reported in Section 3.

Extension to the Highway Point building

2.1.3 Since submission of the Bill, an extension to the Highway Point building, Coleshill Business Park, has been constructed within the land required permanently for construction of the SES scheme (SES3 and AP4 ES Volume 2: CFA19 Map Book, map CT-05-111a, E3, E4). This building extension will require demolition in order to construct the SES scheme.

2.1.4 A supplementary socio-economic assessment is included within Section 3 under 'Socio-economics'.

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

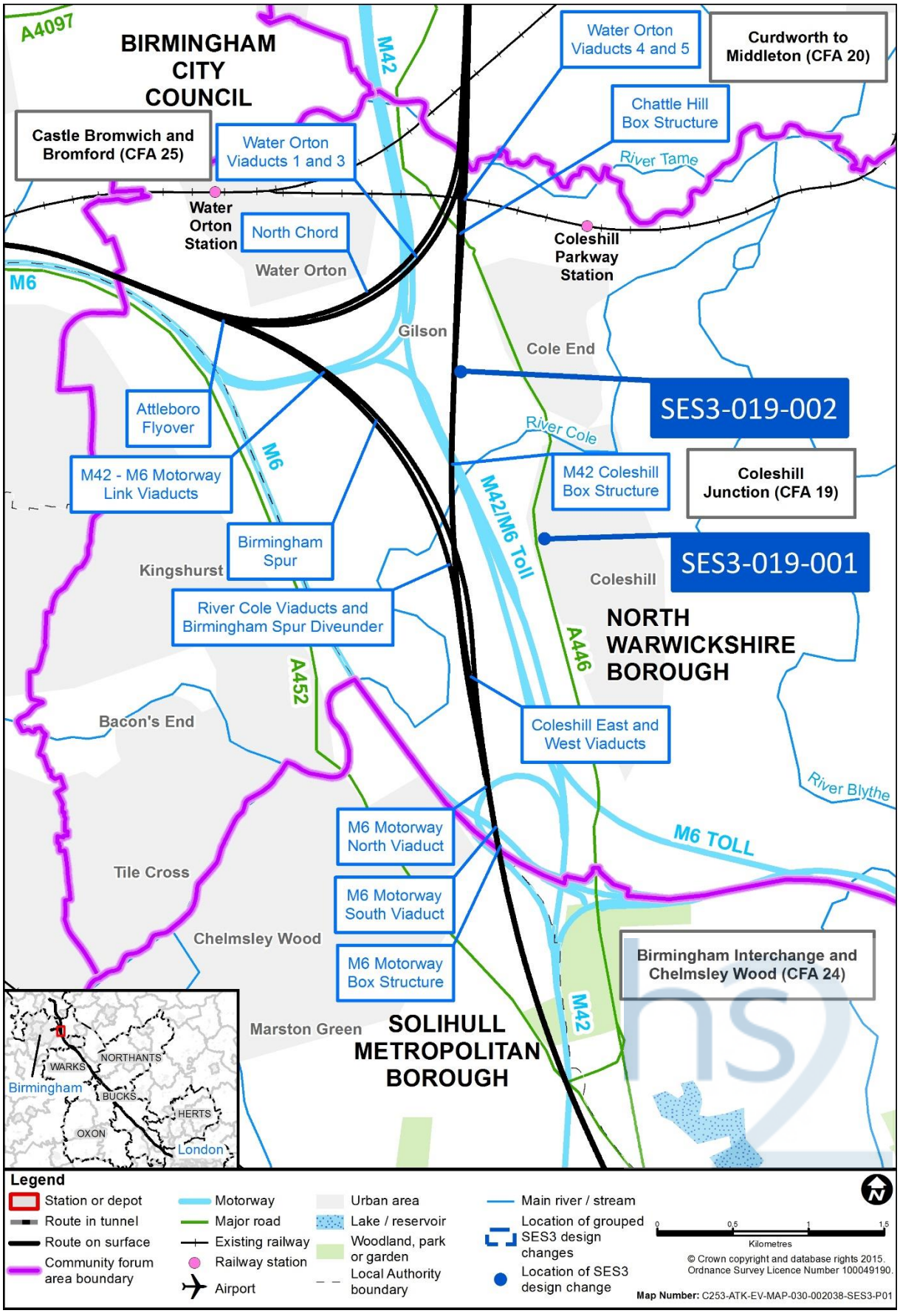
2.2.1 Table 2 provides a summary of the changes to the design or to construction assumptions not requiring a change to the Bill which will result in new or different significant effects in the Coleshill Junction CFA (CFA19). Figure 1 shows the locations of the changes.

Table 2: Summary of changes to the design or to construction assumptions not requiring a change to the Bill in CFA19

Name of design change or construction assumption	Description of the SES scheme	Description of the SES3 scheme
Temporary improvements to the junction between the A446 Stonebridge Road and B4114 Birmingham Road to the west of Coleshill. SES3-019-001	No improvements were proposed to the junction between the A446 Stonebridge Road and B4114 Birmingham Road to the west of Coleshill.	The temporary improvement of the junction between the A446 Stonebridge Road and B4114 Birmingham Road to the west of Coleshill to provide mitigation of the adverse effects of HS2 construction traffic identified on this junction in the SES and AP2 ES (Part 1). The westbound single lane approach on the B4114 Birmingham Road from Coleshill will be widened for a length of approximately 60m to create two lanes. Approximately 0.24ha of additional land is required; however, the works will be

Name of design change or construction assumption	Description of the SES scheme	Description of the SES3 scheme
		undertaken within existing Bill powers as the works are within the highway boundary.
Additional landscape earthworks and relocation of Gilson auto-transformer station. SES3-019-002	The permanent provision of an embankment, approximately 260m long, with noise barriers on both sides and a retaining wall on the west side; an auto-transformer station will be located to the east, with access off the redundant length of the B4117 Gilson Road and an area of landscape mitigation planting (main ES Volume 2: CFA19 Map Book, map CT-06-110, D6).	The permanent provision of additional landscape earthworks up to a maximum of 3m in height above HS2 rail level in an area proposed for landscape mitigation planting to the east of the route in the vicinity of the Gilson Road auto-transformer station. The change will provide additional screening of the auto-transformer station and railway. The permanent relocation of the Gilson Road auto-transformer station by approximately 80m to the north into a cutting behind the mitigation earthworks, in order to enhance the screening effect of the mitigation measures. No additional land is required.

Figure 1: Locations of design changes in CFA19



Description of changes to the design or construction assumptions

Temporary improvements to the junction between the A446 Stonebridge Road and B4114 Birmingham Road to the west of Coleshill (SES3-019-001)

2.2.2 The SES and AP2 ES (Part 1) assessed the impact of revised construction assumptions on the volume of HS2 construction traffic and consequential effects. The major adverse significant effects due to delay and congestion reported in the main ES at the A446 Stonebridge Road/B4114 Birmingham Road junction were unchanged. However, a need for additional measures to mitigate the adverse impacts was identified.

2.2.3 Temporary improvements to the junction are therefore proposed which require the widening of the westbound single lane approach on the B4114 Birmingham Road from Coleshill for a length of approximately 60m to create two separate lanes.

2.2.4 It is anticipated that construction of the improvements will commence in summer 2018 and take approximately eight weeks to complete. The improvements will remain in place for up to five years after which the road will be reinstated to its existing arrangement. An adjacent working area is required for the lay down of materials and storage of plant during construction of the improvements (SES3 and AP4 ES Volume 2: CFA19 Map Book, map CT-05-109-R1, B9).

2.2.5 Approximately 0.24ha of additional land is required. However, the works will be undertaken within existing Bill powers as the works are within the highway boundary.

2.2.6 It is recognised that there may be a local benefit in making these temporary improvements permanent. HS2 Ltd will discuss this further with the local highway authority (Warwickshire County Council) to agree if these measures should be removed after the works, or retained as a permanent improvement using the local highway authority's powers.

Additional landscape earthworks and relocation of Gilson auto-transformer station (SES3-019-002)

2.2.7 The Bill provides for the HS2 scheme to run onto a short length of embankment at Gilson Drive before passing through the higher ground in cutting at Gilson.

2.2.8 Key features of this section of the route provided for within the Bill include:

- an embankment, approximately 260m long, with noise barriers on both sides and a retaining wall on the west side, decreasing from approximately 11m high to ground level; and
- an auto-transformer station located to the east, with access from the redundant length of the B4117 Gilson Road and an area of landscape mitigation planting (main ES Volume 2: CFA19 Map Book, map CT-06-110, D6).

2.2.9 Since submission of the Bill, it has been identified that a design refinement will provide some additional screening of the railway and Gilson auto-transformer station (SES3 and AP4 ES Volume 2: CFA19 Map Book, map CT-06-110, D6). Additional landscape earthworks up to a maximum of 3m in height above the proposed HS2 rail level will be implemented in an area of landscape planting in the SES scheme to the

east of the route in the vicinity of the Gilson Road auto-transformer station. This will provide some additional screening for views of the railway and the auto-transformer station from properties in the Gilson Road area, east of the scheme, towards Coleshill. The planting will be implemented on parts of the raised earthworks.

2.2.10 In addition, the Gilson Road auto-transformer station will be relocated by approximately 80m from the south side of the B4117 to the north side (SES3 and AP4 ES Volume 2: CFA19 Map Book, map CT-06-110, D6). The auto-transformer station will sit on a level site cut into the rising ground to the north to a maximum depth of 5m which will provide further screening.

2.3 Corrections

2.3.1 Since submission of the Bill, the need for a number of corrections in the content of the main ES and SES and AP2 ES has been identified. Table 3 provides a list of those instances where there has been a need to correct the Volume 2 CFA report for Coleshill Junction because of the potential to alter the significant environmental effects reported or a factual inaccuracy relating to significant effects has been identified. The table gives the location of the correction in the relevant ES, the reason for the correction, replicates the text, where applicable provides revised text, and identifies whether the correction changes a significant effect reported. Where relevant, these corrections have been taken into account in the technical assessments contained within Section 3 of this report.

2.4 Topics included in the SES3 assessment

The changes described above in Sections 2.1 to 2.3 result in new or different significant effects in respect of: landscape and visual assessment; socio-economics and traffic and transport. These are described in Section 3.

Table 3: Summary of corrections in CFA19

Reference in the relevant ES	Reason for correction	Text in the relevant ES	Revised text	Change to significant effects and mitigation
Ecology Paragraph 7.4.5. Volume 2, CFA19 of the main ES	The total size of the Coleshill Sewage Works Grassland LWS and percentage area lost to the original scheme were incorrectly reported in the main ES. The area of habitat lost within the Coleshill Sewage Works Grassland LWS, upon which the main ES assessment was based, was reported correctly.	Main ES: Approximately 5.5ha of Coleshill Sewage Works Grassland LWS (almost 20% of the 28ha LWS) will be permanently lost.	Approximately 5.5ha of Coleshill Sewage Works Grassland LWS (almost 50% of the 10.3ha LWS) will be permanently lost.	No The area lost from the Coleshill Sewage Works Grassland LWS remains the same as originally reported in the main ES and in the same location. The level of significance of the effect on the LWS remains the same at county/metropolitan level. No additional mitigation is required.
Ecology Paragraph 7.4.17, Volume 2, CFA19 of the main ES	There was a typographical error in the main ES that reported the level of significance of an effect concerning Assumed Metapopulation (AMP) 33.	Main ES: At AMP33, south west of Water Orton, there will be no loss of water bodies but loss of approximately one third of available terrestrial habitat. This impact will result in permanent adverse effects on the conservation status of the great crested newt population within AMP33 that is significant at the district / borough level.	At AMP33, south west of Water Orton, there will be no loss of water bodies but loss of approximately one third of available terrestrial habitat. This impact will result in permanent adverse effects on the conservation status of the great crested newt population within AMP33 that is significant at the county/metropolitan level.	Yes There is a change to the significant effects reported in the main ES for AMP33 (loss of one third of available terrestrial habitat) from district/borough level to county/metropolitan level. However, the mitigation included within the original scheme was provided on the basis of the population having county/metropolitan value. Therefore, no additional mitigation is required.
Traffic and transport Main ES CFA19, Volume 2, Section 12 SES and AP2 ES, Part 1, Section 3.4	The refined assessments of the traffic impacts for the junctions of the A446 Lichfield Road with B4177 Watton Lane and with B4118 Marsh Lane and for the section of the A446 between Coleshill Heath Road and Marsh Lane were incorrectly reported for the SES and AP2 ES.	SES and AP2 ES (Part 1): The level of significance of effects due to delay and congestion reported in the main ES at the A446 Lichfield Road/B4117 Watton Lane junction is reduced from major significant effect to no significant effect.	The level of significance of effects due to delay and congestion reported in the main ES at the A446 Lichfield Road/B4117 Watton Lane junction is reduced from major significant to minor significant effect in the SES. The refined SES assessment results in the major adverse significant	Yes The correction changes the levels of significant effects reported in Part 1 of the SES and AP2 ES. At the A446 Lichfield Road/B4117 Watton Lane junction, the correction identifies that the no significant effect reported in the SES and AP2 ES should

Reference in the relevant ES	Reason for correction	Text in the relevant ES	Revised text	Change to significant effects and mitigation
		The impact on the A446 Lichfield Road/B4118 Marsh Lane junction was not previously assessed in the main ES. At the A446 Lichfield Road/B4118 Marsh Lane junction, based on the original scheme there would have been a major adverse significant effect to report due to delay and congestion. However, with the refined SES assessment the impacts are reduced to a moderate adverse significant effect. There are changes to the level of significant effect due to traffic related severance reported in the main ES on the section of the A446 between Coleshill Heath Road and B4118 Marsh Lane (reduced from major to moderate adverse significant effect).	effect on the A446 Lichfield Road/B4118 Marsh Lane junction with the original scheme remaining as a major adverse significant effect in the SES. On the A446 between Coleshill Heath Road and B4118 Marsh Lane, the refined SES assessment results in the major adverse significant effect due to traffic related severance with the original scheme remaining as a major adverse significant effect in the SES.	have been reported as a minor significant effect. At the A446 Lichfield Road/ B4118 Marsh Lane junction, the correction identifies that the moderate adverse significant effect reported in the SES and AP2 ES should have been reported as a major adverse significant effect. This junction is subject to mitigation through an amendment proposed in Part 2 of this report. On the A446 between Coleshill Heath Road and B4118 Marsh Lane the correction identifies that the moderate adverse significant effect due to traffic related severance reported in the SES and AP2 ES should have been reported as a major adverse significant effect. Significant effects are shown on map TR-03-104 in the SES3 and AP4 ES, Volume 5, Traffic and Transport Map Book.

3 Assessment of changes

3.1 Landscape and visual assessment

Introduction

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

Scope, assumptions and limitations

3.1.2 The assessment scope, key assumptions and limitations for the landscape and visual assessment are as set out in Volume 1, the SMR (Volume 5: Appendix CT-001-000/1) and the SMR Addendum (Volume 5: Appendix CT-001-000/2) of the main ES. Updates to the methodology for the landscape and visual assessment are also described in Volume 1 of the AP1 ES and Volume 1 of the SES and AP2 ES.

SES3 changes of relevance to this assessment

3.1.3 The following SES3 changes are considered in this assessment:

- temporary improvements to the junction between the A446 Stonebridge Road and B4114 Birmingham Road to the west of Coleshill (SES3-019-001); and
- additional landscape earthworks and relocation of Gilson auto-transformer station (SES3-019-002).

Environmental baseline

Existing baseline

3.1.4 A summary of the baseline information in the main ES relevant to the assessment of the SES3 design changes is provided below. Further details are provided in the main ES Volume 2, CFA19, Section 9. Maps are provided in Volume 5, Landscape report LV-001-019.

3.1.5 The design changes are located within the Cole Valley Landscape Character Area (LCA), as described in the main ES (Volume 2, CFA19, Section 9).

3.1.6 Views west from residences and Grimstock Country House Hotel off the B4117 Gilson Road (viewpoint 312.2.005) and southwest from dwellings on Lawnsdale Close, Coleshill (viewpoint 310.2.010) are located in close proximity to the area and are described in the main ES (Volume 5, Appendix LV-001-019, Part 2).

Future baseline

Construction (2017)

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

3.1.8 None of the identified developments affect the assessment of the SES3 scheme's likely construction impacts on landscape character and views.

Operation (2026)

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

3.1.10 None of the identified developments affect the assessment of the SES3 scheme's likely operational impacts on landscape character and views.

Temporary effects arising during construction

Avoidance and mitigation measures

3.1.11 The measures that have been incorporated into the draft CoCP to avoid or reduce landscape and visual effects during construction remain as stated in the main ES (Volume 2, CFA19, Section 9.4.3).

Assessment of impacts and effects

3.1.12 As defined in the main ES, this assessment of landscape and visual effects in construction has been based on the activities occurring during the peak construction phase, which is defined as the period during which the main construction works will take place.

3.1.13 As is commonplace with major infrastructure works, the scale of the construction activities means that works will be visible in many locations and will have the potential to give rise to significant temporary effects which cannot be mitigated practicably. For further details refer to the main ES (Volume 2, CFA19, Section 9).

Landscape assessment

3.1.14 The main ES reported a moderate adverse significant effect on the Cole Valley LCA due to a reduction in local tranquillity as a result of the scale and extent of construction activity. Construction activities reported included the formation of large scale embankments, construction of numerous viaducts, the realignment of the River Cole, removal of hedgerows and vegetation, demolition of a number of historic and listed buildings and the 'phase 2' building at Coleshill Manor Office Campus and the relocation of overhead power lines. In addition, the presence of construction traffic on existing roads and haul routes was reported. The construction activities introduced additional built form, lighting and general activity within the agricultural landscape.

3.1.15 The proposed temporary improvements to the junction between the A446 Stonebridge Road and B4114 Birmingham Road to the west of Coleshill (SES3-019-001) and additional landscape earthworks and relocation of Gilson auto-transformer station (SES3-019-002) will be localised and will be a small change in the scale of the overall scheme. These will not give rise to a new or different significant effect and will not change the level of significance of the effects reported in the main ES.

Visual assessment

3.1.16 The main ES reported significant effects on visual receptors due to construction activity and visibility of construction plant, including: cranes, temporary construction fencing, the construction of viaducts, box structures, auto-transformer stations, embankments and the Footpath M62 overbridge.

3.1.17 With respect to viewpoint 310.2.010, the main ES reported visibility of construction plant on the A446 Stonebridge Road in the foreground of the view, partially filtered by roadside vegetation, and seen in the context of existing traffic on the road. In addition, upper sections of cranes and construction activity were reported as being highly visible in the middle ground. The main ES reported a moderate adverse effect during construction.

3.1.18 The proposed temporary improvements to the junction between the A446 Stonebridge Road and B4114 Birmingham Road to the west of Coleshill (SES3-019-001) will be visible in the foreground but the view will not be substantially different from that described in the main ES. The proposed change will not give rise to a new or different significant effect and will not change the level of significance of the effects reported in the main ES.

3.1.19 The main ES reported significant effects on viewpoint 312.2.005 during construction. It reported that temporary construction fencing, the realignment of the B4117 Gilson Road and hedgerow removal would be visible within the direct frame of view in the foreground. The construction of the Gilson Road auto-transformer station, the embankments to the M42 Coleshill north viaduct and the cranes constructing Footpath M62 overbridge were reported as visible in the middle ground of the view. As a result, the main ES reported a major adverse significant effect.

3.1.20 The proposed additional landscape earthworks and relocation of Gilson auto-transformer station (SES3-019-002) will result in localised changes to construction activities and components visible in the direct frame of view, including the foreground and middle ground. This will give rise to a different significant visual effect. However, this will not change the level of significance reported in the main ES.

Other mitigation measures

3.1.21 To further reduce the significant effects described above, consideration of where planting can be established early in the construction programme will be given during the detailed design stage. This may include consideration of early planting in ecological mitigation sites which would have the additional benefit of providing some visual screening. However, not all landscape and visual effects can be practicably mitigated due to the visibility of construction activity and the sensitivity of surrounding receptors.

Cumulative effects

3.1.22 There are no new or different likely significant cumulative temporary effects for landscape and visual assessment as a result of the SES3 changes interacting with one another, the AP1 amendments, AP2 amendments, or any relevant committed development.

Summary of likely residual significant effects

3.1.23 The effects described above will be temporary and reversible in nature lasting only for the duration of the construction works.

3.1.24 The proposed change of temporary improvements to the junction between the A446 Stonebridge Road and B4114 Birmingham Road to the west of Coleshill (SES3-019-001) will not give rise to a new or different likely residual significant effect.

3.1.25 The proposed change of additional landscape earthworks and relocation of Gilson auto-transformer station (SES3-019-002) will give rise to a different likely residual significant effect due to a difference in the construction activity and construction plant seen in the view. However, this will not change the level of significance of the effects reported in the main ES.

Permanent effects arising during operation

Avoidance and mitigation measures

3.1.26 The operational assessment of impacts and effects is based on year 1 (2026), year 15 (2041) and year 60 (2086). A process of iterative design and assessment has been employed to avoid or reduce adverse effects during the operation of the SES3 scheme. SES3-019-002 includes incorporated mitigation in the form of additional landscape earthworks.

3.1.27 These measures have been taken into account in the assessment of the operational effects.

Assessment of impacts and effects

Landscape assessment

3.1.28 The main ES reported a moderate adverse significant effect on the Cole Valley LCA in year 1 of operation due to the scheme introducing prominent elements that are either largely characteristic of existing infrastructure or will result in partial loss of characteristic landscape elements. By years 15 and 60 of operation, planting would have established and matured, aiding integration of the embankments and further reflecting the existing landscape character; as a result the main ES reported a reduction of effects to non-significant at year 15 and beyond.

3.1.29 The proposed temporary improvements to the junction between the A446 Stonebridge Road and B4114 Birmingham Road to the west of Coleshill (SES3-019-001) are only relevant to the construction phase and will not therefore 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.

3.1.30 The additional landscape earthworks and relocation of Gilson auto-transformer station (SES3-019-002) will be localised and a small change in the scale of the overall scheme. This will not give rise to a new or different significant effect and will not change the level of significance of the effects reported in the main ES.

Visual assessment

3.1.31 The main ES reported a significant effect on views west from residences and Grimstock Country House Hotel along the B4117 Gilson Road (viewpoint 312.2.005)

due to the realignment of the B4117 Gilson Road and areas of new planting in the foreground of the view, and the Gilson Road auto-transformer station access route (the older section of the B4117 Gilson Road), realigned overhead power lines and M42 Coleshill north viaduct visible in the middle ground. A major adverse significant effect was reported in year 1 of operation reducing to non-significant in year 15 and year 60 once proposed planting had established.

3.1.32 The additional landscape earthworks and the relocation of the Gilson auto-transformer station (SES3-019-002) will result in the realignment of the B4117 Gilson Road and areas of new planting being visible in the foreground of the view. The realigned overhead power lines and the M42 Coleshill north viaduct will be visible in the middle of the view. Additional landscape earthworks will have been formed in order to achieve up to 3m height above the HS2 rail level, in an area proposed for landscape mitigation planting to the east of the route, and around the Gilson Road auto-transformer station. These will provide additional screening of the auto-transformer station and part of the railway (SES3 and AP4 ES Volume 2: CFA19 Map Book, map CT-06-110, D6). The permanent relocation of the Gilson Road auto-transformer station, by approximately 80m to the north into a cutting behind the mitigation earthworks will also enhance the screening effect of the mitigation measures in comparison to the SES scheme. The access route (the former section of the B4117 Gilson Road, pre-realignment) and a small part of the Gilson Road auto-transformer station will be visible along the access road, in the middle ground of the view.

3.1.33 The proposed additional landscape earthworks and the relocation of the Gilson auto-transformer station (SES3-019-002) will give rise to a different significant visual effect. However, whilst this change provides some improvement over the original scheme, it will not change the level of significance reported in the main ES at year 1 of operation or at years 15 and 60.

Other mitigation measures

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

Cumulative effects

3.1.35 There are no new or different likely significant cumulative permanent effects for landscape and visual assessment as a result of the SES3 changes interacting with one another, the AP1 amendments, the AP2 amendments, or any relevant committed development.

Summary of likely residual significant effects

3.1.36 There are no new residual operational significant effects on landscape character or views, as a consequence of the proposed changes. As no other mitigation measures

are considered practicable, the permanent likely residual significant effects during operation remain as reported in the main ES. In most cases, significant effects will reduce over time as the proposed mitigation planting matures and reaches its designed intention.

3.1.37 The relocation of Gilson auto-transformer station (SES3-019-002), includes elements which offer improvements over the original scheme and will give rise to a different significant visual effect but these are not sufficient to change the level of significance of the effects reported in the main ES.

3.2 Socio-economics

Introduction

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

Scope, assumptions and limitations

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

SES3 changes of relevance to this assessment

3.2.3 The new baseline information for the Highway Point building is relevant to this assessment.

Environmental baseline

Existing baseline

3.2.4 The baseline socio-economics information for CFA 19 Coleshill Junction is described in the main ES (Volume 2, CFA Report 19, Section 10).

Future baseline

Construction (2017)

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

3.2.6 None of the identified developments affect the assessment of the SES3 scheme's likely construction impacts on socio-economics.

Operation (2026)

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

3.2.8 None of the identified developments affect the assessment of the SES3 scheme's likely operational impacts on socio-economics.

Effects arising during construction

Avoidance and mitigation measures

3.2.9 Measures to mitigate the impacts of the construction of the SES scheme were detailed in the main ES and these continue to apply in regard of the assessment of the SES3 scheme.

Assessment of impacts and effects

3.2.10 Since submission of the Bill, an extension to the Highway Point building has been constructed within the land required permanently for construction of the SES scheme. The extension is part of a business which manufactures components and finishes for the interiors of motor cars.

3.2.11 The demolition of the extension may impact upon the existing operations of the business, however the business is expected to remain viable. Given the amount of employment affected (displacement or possible loss of an estimated 100 jobs associated with operations within the area of the extension) and the limited availability of similar alternative nearby premises, the effect on the business and its employees is assessed to be major adverse and will therefore be significant.

Other mitigation measures

3.2.12 HS2 Ltd is working with the business to understand the impact of the works and how these might be mitigated in accordance with the provisions of the Compensation Code. Amendments to the design of the SES3 scheme to reduce other impacts on the business are proposed with AP4 (AP4-019-001), as discussed in Section 5.1 of this report.

Cumulative effects

3.2.13 There are no new or different likely significant cumulative effects for socio-economics as a result of the proposed SES3 changes interacting with one another, the AP1 amendments, AP2 amendments, or any relevant committed development.

Summary of likely residual significant effects

3.2.14 The demolition of the extension to the Highway Point building will give rise to a likely new residual major adverse significant effect. Likely significant residual effects are shown on Volume 5 Socio-economics Map Book, map SE-01-066.

Effects arising from operation

3.2.15 No significant operational socio-economic effects were reported in the main ES, and there are no new or different significant effects as a result of SES3 changes.

3.3 Traffic and transport

Introduction

3.3.1 This section of the report describes the environmental baseline in relation to traffic and transport that is relevant to the assessment. It then identifies any new or different likely significant traffic and transport environmental effects as a result of changes

introduced in Section 2, compared to the SES scheme taking into account relevant AP2 amendments.

Scope, assumptions and limitations

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

SES3 changes of relevance to this assessment

3.3.3 The SES3 change relevant to this assessment is the temporary improvement to the junction between the A446 Stonebridge Road and B4114 Birmingham Road to the west of Coleshill (SES3-019-001).

Environmental baseline

Existing baseline

3.3.4 The existing baseline is as described in the main ES, Volume 2, CFA19, Section 12 and in Volume 5, Part 2 (TR-001-000) of the main ES as updated in the SES and AP2 ES.

3.3.5 The baseline analysis determined that the existing traffic flows along the A446 in the vicinity of Birmingham Road amount to 24,500 vehicles per day. Flows on Birmingham Road amount to 12,350 vehicles per day.

Future baseline

Construction

3.3.6 The future baseline for traffic and transport is as described in Volume 2, CFA19, Section 12 of the main ES, as updated in the SES and AP2 ES Volume 2 CFA19, Section 3.

3.3.7 The future baseline analysis for 2021 determined that the traffic flows along the A446 in the vicinity of Birmingham Road amount to 27,800 vehicles per day. Flows on Birmingham Road amount to 14,000 vehicles per day.

Operation (2026 and 2041)

3.3.8 The future baselines for traffic and transport are as set out in Volume 2, CFA19, Section 12 of the main ES as updated in the SES and AP2 ES Volume 2 CFA19, Section 3.

Effects arising during construction

Avoidance and mitigation measures

3.3.9 Avoidance and mitigation measures are set out in Volume 2, CFA19, Section 12 of the main ES. The temporary junction improvements included in the SES3 scheme will mitigate adverse effects and no further traffic and transport avoidance or mitigation measures are proposed.

Assessment of impacts and effects

Temporary effects

3.3.10 The A446 Stonebridge Road/B4114 Birmingham Road temporary junction improvements involve widening of the Birmingham Road westbound to provide two lanes leading up to the give way line at the roundabout. With these changes the junction operation improves, it operates within capacity and delay and congestion due to HS2 construction traffic will be reduced compared to that reported in the main ES. This will be a different significant effect but it will not change the level of significance, which will remain a major adverse significant effect as reported in the main ES.

Permanent effects

3.3.11 The permanent effects of construction on traffic and transport are reported under 'Effects arising from operation'.

Cumulative effects

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

3.3.13 There are no new or different likely significant cumulative effects for traffic and transport as a result of the SES3 scheme interacting with AP2 amendments.

Other mitigation measures

3.3.14 No further changes to the mitigation described in the main ES (Volume 2 CFA19, Section 12) and this SES3 are required.

Summary of likely residual effects

3.3.15 The SES3 design change improves the operation of the A446 Stonebridge Road/B4114 Birmingham Road junction and gives rise to a different significant residual effect as a result of a reduction in delay and congestion due to HS2 construction traffic. However, this will not change the level of significance of the effect reported in the main ES (major adverse significant).

Effects arising from operation

3.3.16 The SES3 design change has no impact in operation. Consequently, there are no new or different operational effects for traffic and transport as a result of the SES3 scheme compared to those reported in the main ES.

Part 2: Additional Provision 4 Environmental Statement

4 Summary of amendments

4.1.1 Table 4 provides a summary of the amendments in the Coleshill Junction CFA (CFA19) and Figure 2 shows the locations.

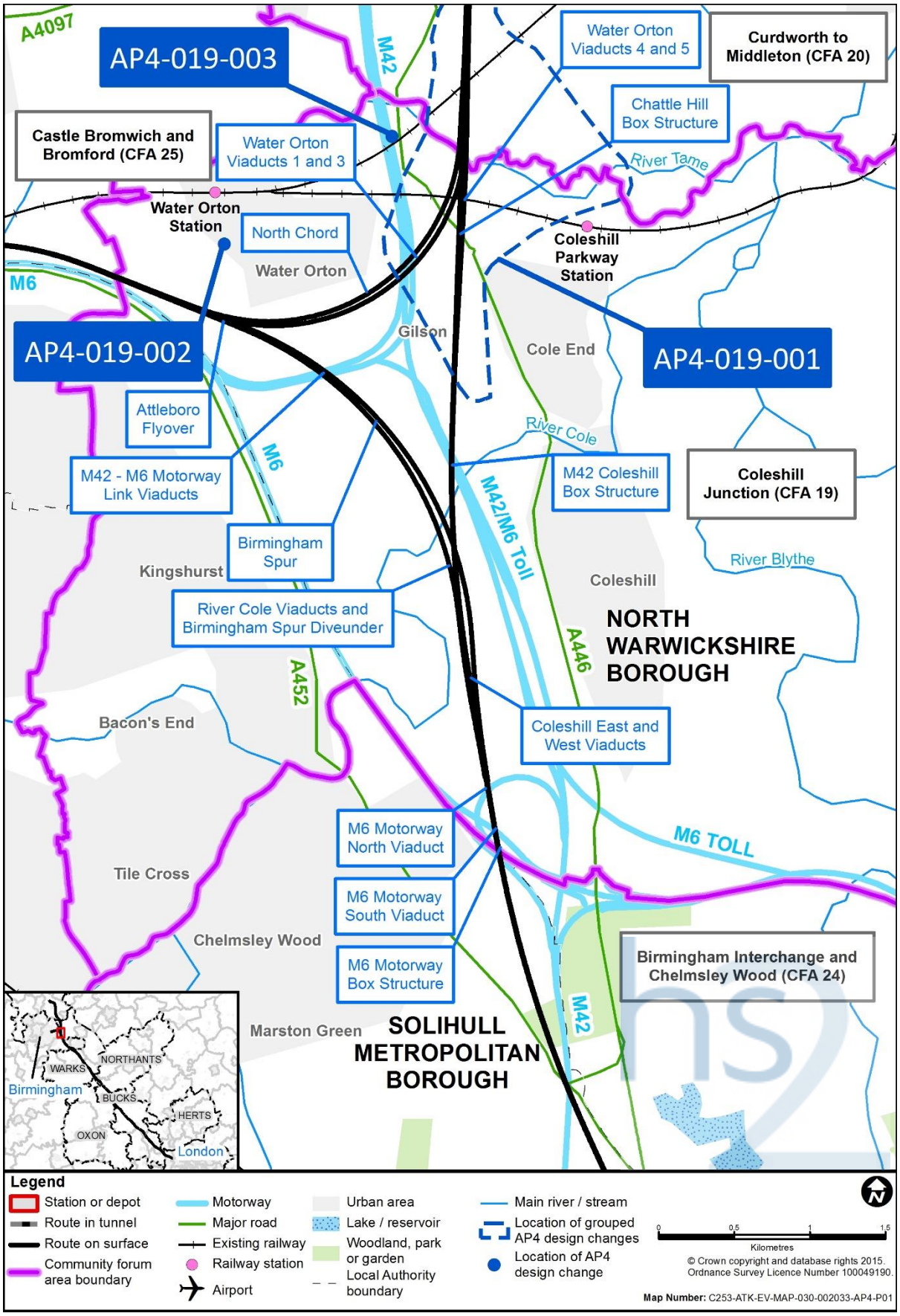
Table 4: Summary of amendments in CFA19

Name of amendment	Description of the SES3 scheme	Description of the AP4 revised scheme
Chattle Hill area amendments AP4-019-001: (amendments extend into CFA20 Curdworth to Middleton; however, all effects for CFA19 and 20 are reported within this CFA report) The Chattle Hill area amendments are shown in SES3 and AP4 ES Volume 2, CFA19 Map Book, maps CT-05-110, CT-05-111a, CT-05-111a-R1, CT-05-112a, CT-06-110, CT-06-111a, CT-06-111a-R1 and CT-06-112a and CFA20 Map Book, map CT-05-111b.		Since submission of the Bill a number of amendments to the scheme have been identified that: - reduce the impact on local businesses; - provide passive provision for potential future widening of the A446 Lichfield Road; - change utility diversions to facilitate construction; - reduce railway maintenance requirements; and - mitigate impacts on the Coleshill Sludge Lagoons LWS. Collectively the amendments result in a net reduction in the land required of approximately 7.9ha.
Rail infrastructure	The permanent provision of the Chattle Hill box structure. The permanent provision of an embankment, approximately 160m long and a pair of viaducts over the Birmingham to Nuneaton Line. The permanent provision of an access road from the A446 Lichfield Road to a drainage pond on the west side and for railway maintenance.	The extension of the south-east wall of the Chattle Hill box structure in order to avoid the need to divert a 16-inch (400mm) steel high-pressure gas main. The permanent provision of a pair of viaducts extending from the Chattle Hill box structure to create a continuous viaduct which will cross the Birmingham to Nuneaton Line. The permanent provision of an access road from the A446 Lichfield Road to a drainage pond on the west side and for railway maintenance in a location which does not preclude potential future widening of the A446 Lichfield Road.
Demolitions	The buildings that will be demolished under the SES3 scheme are listed in Table 1 of the main ES, Volume 2, CFA19 and SES3 and AP4 ES Volume 2, CFA19, Section 2.1.	The AP4 revised scheme requires the demolition of one additional building: the club house of the Old Saltleians Rugby Football Club in order to facilitate the diversion of a 24-inch (600mm) steel high-pressure gas main and the demolition of additional water company assets within Coleshill Sewage Treatment Works in order to facilitate the

Name of amendment	Description of the SES3 scheme	Description of the AP4 revised scheme
		permanent diversion of the 400 kilovolt (kV) overhead line Feckenham to Hams Hall.
Highway realignments	The Chattle Hill box structure will be constructed in two phases; the southern half will be constructed first for a temporary realignment of the A446 Lichfield Road under this completed span while the northern half is constructed; the road will then be reinstated on its existing alignment after the works.	The Chattle Hill box structure will be constructed in two phases; the southern half will be constructed first for a realignment of the A446 Lichfield Road under this completed span while the northern half is constructed; the southern road alignment will remain in place after the works in order to allow any potential future road widening proposals.
Utilities	The permanent diversion of a 12 inch (300mm) high-pressure gas main starting from the Bromwich Court building to the east of the HS2 route through the Coleshill Sewage Treatment Works. The permanent diversion of three high-pressure gas mains commencing near the junction of the A446 Lichfield Road and Gorsey Lane and extending to locations to the west of the HS2 route. The permanent diversion of a 400kV overhead line to the west of the HS2 route between Gilson Drive and Faraday Avenue with a temporary diversion to enable this between Gilson Road and B4117 Watton Lane. There is an AP1 amendment which is relevant to this amendment: AP1-020-033 Additional land for protection of Birmingham and Derby Line near Lichfield Road/Faraday Avenue; land required for the AP1 amendment is also required for the temporary overhead line diversion.	The permanent diversion of a 12 inch (300mm) high-pressure gas main starting from the Bromwich Court building and running to the west of the HS2 route, before crossing back to re-connect on the east side of the route. The permanent diversion of three high-pressure gas mains commencing near the junction of the A446 Lichfield Road and Gorsey Lane, then following the same route under the A446 Lichfield Road and HS2 route before diverging to locations to the west of the route. The permanent diversion of a 400kV overhead line to the east of the HS2 route between Gilson Road (CFA 19) and Faraday Avenue (within CFA20) with a temporary diversion to enable this between the River Tame and Faraday Avenue (within CFA20).
Satellite construction compounds	The temporary provision of four satellite construction compounds within CFA19 and one within CFA20 for the construction of this part of the scheme. The temporary provision of a roadhead split to the north and south of the A446 Lichfield Road.	The temporary provision of four satellite construction compounds within CFA19 and one within CFA20 located to suit the AP4 revised scheme required for the construction of this part of the scheme. The temporary provision of a roadhead located to the south of the A446 Lichfield Road due to the introduction of a viaduct to the north.
Provision of additional grassland habitat creation area adjacent to the River Tame	The construction of the SES3 scheme requires the loss of 5.9ha of the Coleshill Sludge Lagoons LWS.	The permanent provision of a 1.6ha grassland habitat creation area to the east of the route adjacent to the River Tame (within CFA20), in

Name of amendment	Description of the SES3 scheme	Description of the AP4 revised scheme
		order to compensate for the level of permanent impact of the SES3 scheme.
Relocation of Water Orton Primary School AP4-019-002	The permanent loss of an area of playing field at Water Orton Primary School, which is situated on Attleboro Lane, Water Orton due to construction works. The permanent provision of land adjoining the existing school grounds to the south-east to re-provide playing fields. The temporary provision of acoustic screening and construction noise attenuation measures to the south of Water Orton Primary School, to reduce noise levels within the school grounds during the construction of the scheme. The proposed acoustic barrier will also provide visual screening during construction.	Relocation of Water Orton Primary School to Plank Lane within Water Orton village, approximately 150m north-west of its current location. The site will include a new school building, parking facilities; drop-off area, delivery and turning facilities; a school playground; sports pitch and hard games court. The permanent diversion of Footpath M40, which crosses the eastern part of the site, to enable the school to be located on the site. Footpath M40 will be diverted along the eastern site boundary; the diverted length being approximately 150m. Approximately 3.1ha of additional land is required permanently.
Temporary improvements to the junction of the A446 Lichfield Road and B4118 Marsh Lane to the east of Water Orton AP4-019-003	No improvements were proposed to the junction of the A446 Lichfield Road and B4118 Marsh Lane to the east of Water Orton.	The temporary improvement of the junction of the A446 Lichfield Road and B4118 Marsh Lane to the east of Water Orton to provide the additional mitigation for adverse impacts of HS2 construction traffic identified in the SES and AP2 ES (Part 1). The northbound A446 Lichfield Road will be widened to two lanes on both the approach and exit of the junction for a distance of approximately 190m. Additional earthworks will be provided on land to the west of A446 Lichfield Road to the north of B4118 Marsh Lane. The extended earthworks will receive landscape planting. An existing multi-cell flood culvert structure beneath the A446 Lichfield Road to the north and south of B4118 Marsh Lane will be extended. Due to the nature of the proposed earthworks, these will remain in place permanently. The temporary junction improvements will, however, be removed after the main construction period. Approximately 1.1ha of additional land is required permanently and an additional 0.7ha is required temporarily.

Figure 2: Locations of amendments in CFA19



5 Assessment of amendments

5.1 Chattle Hill area amendments (AP4-019-001)

5.1.1 Since submission of the Bill a number of amendments to the scheme have been identified that:

- reduce the impact on local businesses;
- provide passive provision for potential future widening of the A446 Lichfield Road;
- change utility diversions to facilitate construction;
- reduce railway maintenance requirements; and
- mitigate impacts on the Coleshill Sludge Lagoons LWS.

5.1.2 The Chattle Hill area amendments are shown in SES3 and AP4 ES Volume 2: CFA19 Map Book, maps CT-05-110, CT-05-111a, CT-05-111a-R1, CT-05-112a, CT-06-110, CT-06-111a, CT-06-111a-R1 and CT-06-112a. 5ha of additional land is required and 12.9ha of land is no longer required, collectively the amendments therefore result in a net reduction in the land required of approximately 7.9ha.

5.1.3 The following CFA20 AP1 amendment is relevant: AP1-020-033 Additional land for protection of Birmingham and Derby Line near Lichfield Road/Faraday Avenue; land required for the AP1 amendment is also required for the temporary overhead line diversion.

Amendments to rail infrastructure

5.1.4 The Bill scheme in the Chattle Hill Area comprises the following, from south to north:

- an embankment, approximately 250m long, increasing in height to approximately 7m, with a noise barrier on the east side, on the approach to the A446 Lichfield Road;
- a box structure, approximately 110m long over the A446 Lichfield Road, with a noise barrier on the east side; this includes a second span that allows sufficient clearance and flexibility for potential future widening by the highway authority of the A446 Lichfield Road (main ES Volume 2: CFA19 Map Book, map CT-06-111a, F4);
- an embankment, approximately 160m long and approximately 8m high, with a noise barrier on the east side; the southbound Leeds spur starts to split from the main line towards the northern end of this embankment;
- a pair of viaducts carrying the main line tracks over the Birmingham to Nuneaton Line. The tracks diverge to enable the north chord lines to join the main line at the boundary of Coleshill Junction and the Curdworth to Middleton area (CFA20);
- an embankment, approximately 220m long, carrying the main line tracks, approximately 9m high with the north chord line into Birmingham passing

over the main line on viaduct; and

- an access road from the A446 Lichfield Road to a second drainage pond on the west side and for railway maintenance (main ES Volume 2: CFA19 Map Book, map CT-06-111a, D5).

5.1.5 Since submission of the Bill a number of amendments to the scheme have been identified as described below:

- the south-east wall of the Chattle Hill box structure has been extended in order to avoid the need to divert a 16-inch (400mm) steel high-pressure gas main;
- a pair of viaducts will extend from the Chattle Hill box structure to create a continuous viaduct which will cross the Birmingham to Nuneaton Line (SES3 and AP4 ES Volume 2: CFA19 Map Book, map CT-06-111a, F4 to E4). Additional landscape mitigation planting will be implemented to the area beneath and around the viaducts; and
- an access road from the A446 Lichfield Road to a drainage pond on the west side and for railway maintenance (SES3 and AP4 ES Volume 2: CFA19 Map Book, map CT-06-111a, D5).The access road and drainage pond are repositioned approximately 30m to the north so as not to preclude potential future widening of the A446 Lichfield Road by the highway authority.

Demolitions

5.1.6 The buildings that will be demolished under the SES3 scheme are listed in Table 1 of the main ES, Volume 2, CFA19 and SES3 and AP4 ES, Volume 2, CFA19, Section 2.1.

5.1.7 The AP4 revised scheme requires the demolition of one additional building: the club house of the Old Saltleians Rugby Football Club (RFC) (SES3 and AP4 ES Volume 2: CFA19 Map Book, map CT-05-111a, F6) in order to facilitate the diversion of a 24-inch (600mm) steel high-pressure gas main.

5.1.8 Additional water company assets within the Coleshill Sewage Treatment Works will also be demolished in order to facilitate the permanent diversion of the 400kV overhead line Feckenham to Hams Hall.

Highway realignments

5.1.9 The Bill provides for the Chattle Hill box structure to be constructed in two phases; the southern half will be constructed first for a temporary realignment of the A446 Lichfield Road under this completed span while the northern half is constructed; the road will then be reinstated on its existing alignment after the works.

5.1.10 Since submission of the Bill, the scheme has been revised. The temporary southern road realignment will be left in place to allow potential future proposals to widen the A446 Lichfield Road by the highway authority.

Utilities

5.1.11 The Bill provides for a number of major utilities diversions as summarised in Table 5. Since submission of the Bill, these diversions have been revised, also as summarised in Table 5.

Table 5: Summary of amendments to CFA19 utilities

Description of the SES3 scheme	Description of the AP4 revised scheme
24-inch (600mm) steel high-pressure gas main to be diverted from land north of Bromwich Court, under the main HS2 route and the North Chord to connect to the existing network south of the Birmingham to Nuneaton Line (main ES, Volume 2: CFA19 Map Book, map CT-05-111a, F4 to E6).	24-inch (600mm) steel high-pressure gas main to be diverted from the carpark of the Highway Point building, under the A446 Lichfield Road, under the HS2 route to connect to the existing network to the south of the Birmingham to Nuneaton Line (SES3 and AP4 ES Volume 2: CFA19 Map Book, map CT-06-111a, F4 to E6).
24-inch (600mm) steel high-pressure gas main to be diverted south-west from Bromwich Court, under the main HS2 route, north-west under the North Chord and M42/M6 toll connecting to the existing network (main ES, Volume 2: CFA19 Map Book, map CT-05-111a, F4 to G7).	24-inch (600mm) steel high-pressure gas main to be diverted from the western side of the A446 Lichfield Road at the foot of the Lichfield Road embankment, under the HS2 route and under the M42/M6 toll to connect to the existing network (SES3 and AP4 ES Volume 2: CFA19 Map Book, map CT-06-111a, F4 to F8).
18-inch (450mm) steel high-pressure gas main to be diverted from the existing network between the main HS2 route and the M42/M6 toll, south and west under the M42/M6 toll, parallel to the south of the North Chord to the high-pressure reducing station near Attleboro Lane (main ES, Volume 2: CFA19 Map Book, map CT-05-111a, G5 and CT-05-134a, F7).	18-inch (450mm) steel high-pressure gas main to be diverted from the western side of the A446 Lichfield Road at the foot of the Lichfield Road embankment under the HS2 route to connect to the original scheme diversion to the east of the B4117 Gilson Road (SES3 and AP4 ES Volume 2: CFA19 Map Book, map CT-06-111a, F4 to H6).
12-inch (300mm) high-pressure gas main to be diverted from Bromwich Court, to the east of the Highway Point building, heading north-west through the Coleshill Sewage Treatment Works to connect with the existing network (main ES, Volume 2: CFA19 Map Book map CT-05-111a, F4 to B3).	12-inch (300mm) steel high-pressure gas main to be diverted from west of the Bromwich Court building, under the A446 Lichfield Road, under the HS2 route and the Birmingham to Nuneaton Line to connect to the existing network to the immediate south of an existing gas pressure reducing station within CFA20 (SES3 and AP4 ES Volume 2: CFA19 Map Book, map CT-06-111a, F4 to B3).
400kV overhead power line Feckenham to Hams Hall diversion near M6/M42 junction, to divert the route over the HS2 railway (main ES Volume 2: CFA19 Map Book, map CT-05-111, F5, F6, G3 and G4). This will require a temporary diversion between Gilson Road and Watton Lane.	400kV overhead power line Feckenham to Hams Hall to be permanently diverted, to the east of the route between Gilson Road and Faraday Avenue within CFA20 (SES3 and AP4 ES Volume 2: CFA19 Map Book, map CT-05-110, E5 to A5; map CT-05-111a, J3 to A3; map CT-05-112a, J5 to F5). This will require a temporary diversion for a period of 4 months between the Birmingham and Derby Line and Faraday Avenue.

5.1.12 Where gas mains are to be diverted under highways and existing railways (the A446 Lichfield Road, B4117 Watton Lane, B4117 Gilson Road, the M42/M6 Toll and the Birmingham to Nuneaton Railway), trenchless methods will be utilised. This means they will be drilled under the highway or railway, avoiding the need to excavate a trench across it. This method will also be employed to realign the 12-inch high-pressure gas main under the River Tame.

5.1.13 At the point where the gas mains will be diverted or reconnected back into the existing network an area of ground will need to be excavated in order to expose the existing gas mains and allow the new sections of gas main to be installed and connected whilst the mains remain in operation. The excavations are sized according to the size of the gas mains being connected and the amount of land available.

5.1.14 The 400kV overhead power line Feckenham to Hams Hall will be permanently diverted, to the east of the route between Gilson Road and Faraday Avenue within

CFA20 (SES3 and AP4 ES Volume 2: CFA19 Map Book, map CT-05-110, E5 to A5; Map CT-05-111a, J3 to A3; map CT-05-112a, J5 to F5). This will require a temporary diversion for a period of 4 months between the Birmingham and Derby Line and Faraday Avenue.

5.1.15 Where the overhead power line crosses transport routes there will be a requirement to temporarily erect scaffolding for a period of approximately 6 months to support netting over the routes to allow the diversion works.

Satellite construction compounds and roadheads

5.1.16 Table 2 of the main ES Volume 2: CFA19 and 20 provided details of the satellite construction compounds provided for by the Bill within CFA19 and 20. Changes to the compounds as a result of this amendment are set out in Table 6.

5.1.17 The following compound locations and durations are amended as a result of the revised utility diversions within the AP4 revised scheme:

- Water Orton viaduct 1 and 3 (south) satellite compound;
- Water Orton viaduct 1 and 3 (central) satellite compound;
- Chattle Hill box structure satellite compound; and
- Curdworth viaduct (south) satellite compound (within CFA20).

5.1.18 The Water Orton viaduct 1 and 3 (north) satellite compound is relocated so as not to preclude potential future widening of the A446 Lichfield Road by the highway authority.

5.1.19 The Lichfield Road north and south bound roadhead is relocated to the south of the A446 Lichfield Road due to the introduction of the viaduct (SES3 and AP4 ES, Volume 2, CFA19 Map Book, map CT-05-111a, G4 and G5).

Table 6: Summary of amendments to CFA19 and CFA20 satellite construction compounds[1]

Compound name and amended location	Amended principal construction activity	Amended Start date (year, quarter)	Amended estimated duration of use
Water Orton viaduct 1 and 3 (south) satellite compound (SES3 and AP4 ES, Volume 2: CFA19 Map Book, map CT-05-111a, F8).	Construction of Water Orton viaduct No.1 and No.3 over M42/slip road and Gilson Road and Watton Lane embankment.	2018, Q4	Three years
Water Orton viaduct 1 and 3 (central) satellite compound (SES3 and AP4 ES, Volume 2: CFA19 Map Book, map CT-05-111a, F5).	Construction of Water Orton viaduct No.1 and No.3 over M42/slip road and Gilson Road and Watton Lane embankment.	2018, Q4	Three years
Water Orton viaduct 1 and 3 (north) satellite compound (SES3 and AP4 ES,	Construction of Chattle Hill Box Structure, Water Orton No.1, 2, 3/River	2018, Q4	Three years, four months

[1] Note: The amendments do not change the highways access routes or the numbers of workers and therefore these columns are not included within Table 6.

Compound name and amended location	Amended principal construction activity	Amended Start date (year, quarter)	Amended estimated duration of use
Volume 2: CFA19 Map Book, map CT-05-111a, D5).	Tame east and west viaducts, Watton House.		
Chattle Hill box structure satellite compound (SES3 and AP4 ES, Volume 2: CFA19 Map Book, map CT-05-111a, F4).	Construction of Chattle Hill box structure over A446.	2018, Q4	No change
Curdworth viaduct (south) satellite compound (SES3 and AP4 ES, Volume 2: CFA20 Map Book, map CT-05-111b, B4 to B5). (Within CFA20)	Construction of River Tame East & West viaduct, Curdworth viaduct, Water Orton No.1 and 2 viaducts.	2018, Q4	Three years, four months

Provision of additional grassland habitat creation area adjacent to the River Tame

5.1.20 As reported in the SES and AP2 ES (Part 1), the designated Coleshill Sludge Lagoons LWS is of county/metropolitan value. The designation results in a new significant adverse effect on the integrity of the site. It was acknowledged that additional compensation would be required within a subsequent AP to address adverse effects on the site and associated habitats. The construction of the SES3 scheme would have resulted in the loss of 5.9ha of the LWS.

5.1.21 As part of the amendment a 1.6ha grassland habitat creation area will be created as compensation for the loss from the LWS. In addition, the amendment will involve a 2.4ha area of the LWS which will be restored to provide similar habitat types to those currently present.

5.1.22 The area proposed for the grassland habitat creation is located between the eastern boundary of Coleshill Sludge Lagoons LWS and the River Tame (within CFA20). The habitat creation area will include a mosaic of grassland and wetland habitats and will act as a receptor site for water voles, should this species require translocation from Coleshill Sewage Works Grassland LWS as a result of early utilities work. Access to the habitat creation area would be provided via Edison Road to the public highway for which new access rights are required.

Topics included in the assessment

5.1.23 The Chattle Hill area amendments are considered to result in changes that require a reassessment of the environmental effects and/or proposed mitigation as set out in the main ES with respect to: agriculture, forestry and soils, air quality, community, cultural heritage, ecology, land quality, landscape and visual assessment, socio-economics, sound, noise and vibration, traffic and transport, and water resources and flood risk.

Agriculture, forestry and soils

Introduction

5.1.24 This section of the report describes the environmental baseline in relation to agriculture, forestry and soils that is relevant to the assessment. It then identifies any new or different likely significant environmental effects as a result of the amendment, compared to those of the SES3 scheme.

Scope, assumptions and limitations

5.1.25 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.

5.1.26 The area of agricultural land affected by the amendment is relatively small (a 3.6ha reduction in land temporarily required) and therefore will not alter the significance of effect, or result in a different effect, on best and most versatile (BMV) agricultural land or forestry land within the CFA19 area. The route-wide effects on BMV land and forestry land are reported in Volume 3.

Existing baseline

5.1.27 This amendment (AP4-019-001) will directly affect one agricultural holding at Newlands Farm (CFA19/8), which is a mixed arable and livestock holding covering 93.1ha. It is assessed as being of medium sensitivity to change.

Future baseline

Construction (2017)

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

5.1.29 None of the identified developments affect the assessment of the AP4 amendment's likely construction impacts on agriculture, forestry and soils.

5.1.30 Most existing environmental stewardship agreements will expire in 2015 and will be replaced by a new environmental land management scheme (countryside stewardship) which, together with the new greening measures introduced by Common Agricultural Policy reform, will affect the detailed management of individual farm holdings but are not expected to change fundamentally the baseline circumstances described.

Operation (2026)

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

5.1.32 None of the identified developments affect the assessment of the AP4 amendment's likely operational impacts on agriculture, forestry and soils.

Effects arising during construction

5.1.33 The main ES reported a temporary major/moderate adverse significant effect on Newlands Farm. The area of agricultural land required temporarily from this holding will reduce by 3.6ha as a result of the amendment, from 78.4ha (84%) to 74.8ha (80%), but the level of significance of effect remains as major/moderate. The main ES also reported a permanent major/moderate adverse significant effect on Newlands Farm. However, this amendment does not alter the amount of land required permanently from this holding and the level of significance of effect reported in the main ES will not change.

5.1.34 There are no new or different significant construction effects on Newlands Farm as a result of this amendment.

Effects arising from operation

5.1.35 The amendment will not give rise to new or different significant effects during operation and will not change the level of significance of the effects reported in the main ES.

Mitigation and residual effects

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

5.1.37 The amendment will not result in any change in the likely residual significant effects reported in the main ES.

Cumulative effects

5.1.38 There are no new or different likely significant cumulative effects for agriculture, forestry and soils as a result of the AP4 amendments interacting with one another, the AP1 amendments, the AP2 amendments or any relevant committed development.

Air quality

Introduction

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

Scope, assumptions and limitations

5.1.40 The assessment scope, key assumptions and limitations and the methodology for determining significance of effects for air quality are set out in the SMR Addendum 3 (Volume 5: Appendix CT-001-000/4) of the SES2 and AP3 ES.

5.1.41 The assessment of the AP4 revised scheme has assumed that the general measures detailed in Section 7 of the draft CoCP (Volume 5: Appendix CT-003-000) in the main ES will be implemented.

Existing baseline

5.1.42 The baseline conditions with regard to air quality have not changed from those reported in the main ES (Volume 2, CFA19, Section 4).

5.1.43 Receptors relevant to the proposed amendment that could potentially be affected by changes in air quality include residential properties; on Chattle Hill, off the A446 Lichfield Road, Coleshill and on B4117 Watton Lane, Water Orton.

5.1.44 There are no statutory or non-statutory designated sites that could potentially be affected by changes in air quality as a result of the proposed amendment.

Future baseline

Construction (2017)

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

5.1.46 None of the identified developments affect the assessment of the AP4 amendment's likely construction impacts on air quality.

Operation (2026)

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

5.1.48 None of the identified developments affect the assessment of the AP4 amendment's likely operational impacts on air quality.

Effects arising during construction

5.1.49 An assessment has been undertaken for receptors sensitive to dust soiling and human health effects, located close to dust generating activities from construction of the amendment.

5.1.50 The construction dust assessment has taken into consideration changes to the magnitude of dust emissions for the dust generating activities associated with the amendment and the sensitivity of the surrounding area, in terms of the receptors present and the distance of the receptors from the construction activities.

5.1.51 The amendment does not change the magnitude of the activities during the construction phase in terms of dust generating potential from that reported in the main ES.

5.1.52 The amendment comprises a change to the footprint of the earthworks and construction activities relative to the relevant receptors on Chattle Hill and Watton Lane. The amendment will result in a low to medium risk of dust impacts.

5.1.53 With the implementation of the measures contained within the draft CoCP (Volume 5: Appendix CT-003-000 of the main ES), no significant effects are anticipated from dust generating activities. The main ES (Volume 2, CFA19, Section 4) did not report any

significant effects from construction dust and this remains unchanged for the amendment.

5.1.54 The amendment is not considered to make changes to traffic flows and road alignments that require reassessment of air quality impacts from construction traffic.

5.1.55 The amendment will not give rise to any new or different significant effects during construction and will not change the level of significance of the effects reported in the main ES (Volume 2, CFA19, Section 4).

Effects arising from operation

5.1.56 The amendment will not give rise to new or different significant effects during operation and will not change the level of significance of the effects reported in the main ES (Volume 2, CFA19, Section 4).

Mitigation and residual effects

5.1.57 Emissions to the atmosphere will be controlled and managed during construction through the route-wide implementation of the CoCP.

5.1.58 No additional avoidance and mitigation measures (i.e. in addition to those identified in the main ES) are required during construction.

5.1.59 As reported in the main ES no mitigation measures are required during operation in relation to air quality.

5.1.60 The amendment will not give rise to new or different residual significant effects and will not change the level of significance of the effects on air quality reported in the main ES.

Cumulative effects

5.1.61 There are no new or different likely significant cumulative effects for air quality as a result of the AP4 amendments acting in combination with one another, the AP1 amendments, AP2 amendments or any relevant committed development.

Community

Introduction

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

Scope, assumptions and limitations

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

Existing baseline

5.1.64 The focus of the study area is the northern edge of Coleshill and around the settlements of Gilson and Water Orton. The Chattle Hill area amendments are primarily to the north of Coleshill.

5.1.65 The Old Saltleians RFC is situated on the northern edge of Gilson, falling within land required by the scheme. The RFC is a well-established club with approximately 390 adult and junior members. It has three senior full size pitches, one junior pitch and three mini pitches, as well as a floodlit training area. There is also a main clubhouse which includes a bar and a gym and is used for social events.

Future baseline

Construction (2017)

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

5.1.67 None of the identified developments affect the assessment of the AP4 scheme's likely construction impacts on community.

Operation (2026)

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

5.1.69 None of the identified developments affect the assessment of the AP4 scheme's likely operational impacts on community.

Effects arising during construction

5.1.70 The main ES identified a permanent major adverse effect on the Old Saltleians RFC, Water Orton. The community effect related to the loss of land for the rugby club facilities, car park and associated storage. Although the SES3 scheme did not involve the need to demolish rugby club buildings, the loss of land meant that the club would no longer be able to operate at the site either during or following construction. The Chattle Hill area amendments will now also require the demolition of the club building to facilitate the revised gas main diversions. The amendment will not, however, give rise to any new or different significant effects and will not change the level of significance of the effects reported in the main ES and SES and AP2 ES.

Effects arising from operation

5.1.71 The amendment (AP4-019-001) 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 and SES and AP2 ES.

Mitigation and residual effects

5.1.72 No additional mitigation measures (i.e. in addition to those identified in the main ES and subsequent SES reports) are required. HS2 Ltd is working with the owners of the Old Saltleians RFC to assist them with the identification of a suitable alternative site.

5.1.73 The amendment (AP4-019-001) will not give rise to any new or different significant effects and will not change the level of significance of the effects reported in the main ES (permanent major adverse).

Cumulative effects

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

Cultural heritage

Introduction

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

Scope, assumptions and limitations

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

Existing baseline

5.1.77 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 was updated with the results of additional survey work in the SES and AP2 ES.

5.1.78 Details of survey and desk-based work undertaken in this CFA since September 2013 is provided in the SES and AP2 ES, Volume 5, Appendix CH-004-019 and Volume 5 map series CH-07; CH-09 and CH-10, where this was relevant to the assessment of a new or different significant effect.

5.1.79 Heritage assets potentially affected by the amendment through physical change or changes to their setting are:

- former land division[2] and ridge and furrow earthworks, south of River Tame (asset reference COL048)[3], which are of low value;
- Blyth Mill, Mill House and Blyth Hall Packhorse Bridge (asset reference COL074), which are of moderate value;
- an area of former ridge and furrow (asset reference COL094), the remains of which are not significant; and

[2] 'Land division' is evidence, through cropmarks, LiDAR results or earthworks, for the historical partitioning or demarcation of land, usually agricultural.
[3] Cultural heritage assets are identified with a unique reference code, COLXXX; further detail on these assets can be found in the gazetteer in Volume 5 of the main ES: Appendix CH-002-019.

- possible pits and ditches (asset reference COL106), which are of low value.

Future baseline

Construction (2017)

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

5.1.81 None of the identified developments affect the assessment of the AP4 amendment's likely construction impacts on cultural heritage.

Operation (2026)

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

5.1.83 None of the identified developments affects the assessment of the AP4 amendment's likely operational impacts on cultural heritage.

Effects arising during construction

5.1.84 The main ES reported a permanent high adverse impact on former land division and ridge and furrow earthworks, south of River Tame (asset reference COL048), an asset of low value, giving rise to a moderate adverse effect, which is significant. The amendment will reduce the area of the asset affected by approximately a third, due to the revised route for the high pressure gas main. However, as the asset is ridge and furrow earthworks and approximately a third of the asset will still be removed, the adverse impact of the scheme on the asset is still considered to be high. As such, the amendment will not give rise to a new or different significant effect on the asset and does not change the level of significance of effects reported in the main ES.

5.1.85 The main ES reported a permanent high adverse impact on an area of former ridge and furrow earthworks (asset reference COL094), an asset of no significant value, from the construction of the proposed scheme, giving rise to a negligible effect which is not significant. The amendment will reduce the area of the asset affected by approximately half, due to the reduced land take required for the revised route for the high-pressure gas main. However, as the asset is a large area of former ridge and furrow earthworks, and approximately half of the asset will still be removed, the adverse impact of the scheme on the asset is still considered to be high. As such, the amendment will not give rise to new or different significant effects on the asset and does not change the level of significance reported in the main ES.

5.1.86 The main ES reported a high adverse impact on possible ditches and pits (asset reference COL106), an asset of low value, from the construction of Watton House south embankment at Chattle Hill, giving rise to a moderate adverse effect which is significant. The amendment will not reduce the impact on the asset, as the works will still result in the asset being removed, due to the construction of the Water Orton Viaduct 1 and 3 (Central) Satellite Compound. As such, the amendment will not give rise to new or different significant effects on the asset and does not change the level of significance reported in the main ES.

5.1.87 The provision of the additional grassland habitat creation to provide mitigation for the newly designated Coleshill Sludge Lagoons LWS will give rise to a new temporary impact on Blyth Mill, Mill House and Blyth Hall Packhorse Bridge (asset reference COL074). The creation of this proposed additional grassland habitat will have a minimal impact on the setting of this asset of moderate value. The amendment will change the level of the temporary effects reported in the main ES from neutral to minor adverse, which is not significant.

5.1.88 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.

Effects arising from operation

5.1.89 The amendment will not give rise to new or different significant effects and will not change the level of significance of the effects reported in the main ES.

Mitigation and residual effects

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

5.1.91 The amendment does not give rise to any new or different residual significant effects.

Cumulative effects

5.1.92 The area of former land division and ridge and furrow (asset reference COL048) is also effected by temporary improvements to the junction of the A446 Lichfield Road and B4118 Marsh Lane to the east of Water Orton (AP4-019-003). The impacts of the two amendments does not give rise to a new or different significant effect.

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

Ecology

Introduction

5.1.94 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 amendment, compared to those of the SES3 scheme.

Scope, assumptions and limitations

5.1.95 Updates to the scope of the assessment for ecology are set out in Volume 1 of the SES3 and AP4 ES. The key assumptions and limitations, and the methodology for determining significance of effects are as set out in Volume 1, the SMR and the SMR Addendum (Volume 5: Appendix CT-001-000/01 and CT-001-000/02 of the main ES) and in Addendum 4 to the SMR (SES3 and AP4 ES Volume 5: CT-001-000/5).

5.1.96 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 AP4 revised scheme.

Existing baseline

5.1.97 The ecological baseline of the land required for the amendment has been based on field data collated for the main ES and the SES and AP2 ES, additional survey work for great crested newt, undertaken from April 2015 to June 2015, aerial photography and relevant existing information gathered from national organisations and from regional and local sources including: Staffordshire Ecological Record and Staffordshire Wildlife Trust.

5.1.98 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 SES3 and AP4, Volume 5: Appendix-001-003. For those receptors described in the main ES, further details are provided in Volume 2, CFA19, Section 7 and in CFA19 Volume 5, including maps EC-01 to EC-12. For those receptors described in the SES and AP2 ES, further details are provided in Volume 2, CFA19, Section 2 and in Volume 5, including maps EC-01, 07, 09 and 10.

Designated sites

5.1.99 There are no statutory designated nature conservation sites or areas of woodland relevant to the assessment.

5.1.100 There are five non-statutory designated sites within 500m of the amendment and which are relevant to the assessment. They are:

- Coleshill Sludge Lagoons LWS – located within land required for the diversion of the overhead power line between Gilson and Hams Hall. This LWS is designated for its mosaic of habitats including swamp, bare ground, pioneer habitats, steep banks, dense and open scrub and damp areas. As reported in the SES and AP2 ES (Part 1), the LWS is of county/metropolitan value;
- Coleshill Sewage Works Grassland LWS – located within land required for the diversion of the overhead power line between Gilson and Hams Hall. The LWS is designated for the series of floodplain grasslands and wetland it supports, adjacent to the River Tame. As reported in the main ES the LWS is of county/metropolitan value;
- Water Orton Triangle LWS – located approximately 150m from the land required for the relocated access road from the A446 Lichfield Road and a rerouted 12 inch (300mm) high-pressure gas main. It is designated as it supports a complex mosaic of habitats including semi-improved grassland, marsh, scrub and damp woodland. This LWS is of county/metropolitan value;
- Marsh Lane Grassland and Marsh LWS – located approximately 300m from the land required for the relocated access road from the A446 Lichfield Road and a rerouted 12 inch (300mm) high-pressure gas main. The LWS represents one of a series of grasslands and wetlands along the River Tame which forms a wildlife corridor leading from the Tame valley wetlands complex into the Birmingham urban area. This LWS is of county/metropolitan value; and

- Hams Hall Woodland LWS (Hams Lane Wood section) – located approximately 225m from the land required for the diversion of the overhead power line between Gilson and Hams Hall. The LWS is designated for its oak woodland and wet woodland. As reported in the main ES the LWS is of county/metropolitan value.

Habitats

5.1.101 The habitat occurring within the land required for the diversion of a high-pressure gas main in the location of the M42/M6 toll, B4117 Watton Lane and Gorsey Lane includes broadleaved plantation woodland and scattered scrub. In addition, the Old Saltleians RFC building is within land required for the diversion of a high-pressure gas main in this area. The broadleaved woodland and scrub in this area were each reported to be of local/parish value in the main ES. The additional land required for the diversion of the overhead power line between Gilson and Hams Hall consists of semi-improved grassland, scattered trees, scrub and tall ruderal vegetation. Scrub habitat was valued in the main ES as of local/parish value, the remainder of these habitats are considered to be of no more than local/parish value.

5.1.102 An area of mosaic habitat, comprising mainly tall ruderal vegetation is present within the land required for the overhead power line within the Coleshill Sewage Treatment Works. The mosaic habitat located within the Coleshill Sewage Treatment Works is of district/borough value as reported in Part 1 of the SES and AP2 ES. The land required for the diversion route crosses two watercourses: the River Tame, which is of district/borough value; and the Minworth effluent conduit which is of local/parish value.

5.1.103 The land required for the permanent provision of additional ecological mitigation adjacent to the newly designated Coleshill Sludge Lagoons LWS consists of poor semi-improved grassland, scattered trees and is next to Edison Road. This area lies adjacent to the Coleshill Sewage Treatment Works and is considered to be of local/parish value.

5.1.104 The land which is no longer required for the diversion of a high-pressure gas main to the east of the route consists of mosaic habitat within Coleshill Sludge Lagoons LWS (including semi-improved grassland, tall ruderal, scattered trees, scrub and a water body) of district/ borough value and areas of semi-improved grassland is of local/parish value.

5.1.105 The land no longer required for the diversion of the overhead power line between Gilson and Hams Hall to the west of the route consists of: semi-improved grassland of county/metropolitan value; tall ruderal vegetation and scattered trees of local/parish value within Coleshill Sewage Works Grassland LWS, and mosaic habitat of district/borough value within Coleshill Sludge Lagoons LWS. In addition, the land no longer required contains areas of broadleaved woodland and poor semi-improved grassland of local/parish value and arable land, tall ruderal, and scattered trees all of no more than local/parish value. Gilson Hall and an associated building to the east will no longer be required for the diversion of the overhead power line between Gilson and Hams Hall.

5.1.106 All other habitats within the land required for construction of the AP4 revised scheme in this area are of negligible value.

Protected and/or notable species

5.1.107 There are no known great crested newt breeding ponds located within the land required for the amendment. All waterbodies located within 250m of the land required for the amendment are considered to be unsuitable for great crested newt or have been surveyed as part of the work carried out for the main ES, SES or SES3 and found not to support great created newt.

5.1.108 The main ES reported an assemblage of bats (including common pipistrelle, soprano pipistrelle, brown long-eared bat, noctule, *Myotis* species and *Nathusius* pipistrelle) using foraging and commuting habitats in areas of woodland within Coleshill Sewage Treatment Works and along the adjacent River Tame. The main ES valued this assemblage of bats to be of district/borough value. The Old Saltleians RFC building has been assessed to be of low potential for roosting bats.

5.1.109 A review of aerial photography indicates that a number of trees are present along the road verge of the M42/M6 toll and Gorsey Lane within land required for the diversion of the high-pressure gas main, and adjacent to Minworth effluent conduit to the north of the Coleshill Sewage Treatment Works within land required for the diversion of the overhead power line. Trees are also located within the land required for the provision of additional ecological mitigation adjacent to the newly designated Coleshill Sludge Lagoons LWS. Connective habitat, in the form of the River Tame, Minworth effluent conduit, and tree lines, are present linking the Old Saltleians RFC building and the trees located within the land required for the amendment to those used by the bat assemblage. Considering the low potential offered by the Old Saltleians RFC building to support roosting bats, it is unlikely that the assemblage of bats using habitats in areas of woodland within Coleshill Sewage Treatment Works and along the adjacent River Tame would roost within this building. Taking a precautionary approach, the trees present within the land required for the amendment could support roosting bats, and the habitats within the land required could support foraging and commuting bats that are part of the assemblage of bats using foraging and commuting habitats in areas of woodland within Coleshill Sewage Treatment Works and along the adjacent River Tame.

5.1.110 The main ES reported a water vole population present on the ephemeral flooded pools within Coleshill Sewage Works Grassland LWS and assumed to be on the adjacent River Tame to be of county/metropolitan value. A small section of the land required for the diversion of the overhead power line is located to the south of the Coleshill Sludge Lagoons LWS crossing the River Tame in the area where this water vole population is recorded to be present.

5.1.111 An area of land no longer required for the diversion of the overhead power line between Gilson and Hams Hall to the west of the route is within Coleshill Sewage Works Grassland LWS and was reported in the main ES to support an assemblage of notable plants of county/metropolitan value.

5.1.112 Reptile surveys were undertaken in the land required for the diversion of the overhead power line, located at Hams Hall Distribution Park. The main ES reported a low population of grass snake at Hams Hall Distribution Park of local/parish value. Grassland areas within the land required for the permanent provision of additional ecological mitigation adjacent to Coleshill Sludge Lagoons LWS could support

common reptile species. The main ES considered that areas of suitable habitat for reptiles within the Coleshill Junction area which were not surveyed could support populations of common reptile species of up to local/parish value.

5.1.113 The trees along the road verge of the M42/M6 toll and Gorsey Lane within land required for the diversion of a high-pressure gas main and adjacent to the Minworth effluent conduit north of the Coleshill Sewage Treatment Works within land required for the diversion of the overhead power line have the potential to support breeding birds. Considering the habitat present and the wider landscape setting, it is likely that common and widespread bird species will be present in these areas and that these bird populations would be of no more than local/parish value.

5.1.114 The area of semi-improved grassland located within the land required for the permanent provision of additional ecological mitigation has the potential to support breeding and wintering birds. The main ES reported wintering populations of green sandpiper and wintering gadwall within Coleshill Sewage Treatment Works. The population of wintering green sandpiper was reported in the main ES to be of county/metropolitan value, whilst the population of wintering gadwall was reported to be of district/borough value. In addition, the main ES reported the breeding bird assemblage and wintering bird assemblage within Coleshill Sewage Treatment Works to both be of local/parish value.

Future baseline

Construction (2017)

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

5.1.116 None of the identified developments affects the assessment of the AP4 amendment's likely construction impacts on ecology.

Operation (2026)

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

5.1.118 None of the identified developments affects the assessment of the AP4 amendment's likely operational impacts on ecology.

Effects arising during construction

Avoidance and mitigation measures

5.1.119 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

5.1.120 The main ES reported the loss of 5.5ha of Coleshill Sewage Works Grassland LWS resulting in an adverse effect on the integrity of the LWS that would be significant at a county/metropolitan level. The amendment will result in a reduction of land required

within the Coleshill Sewage Works Grassland LWS as a result of the diversion of the overhead line from the west of the route to the east of the route. The 5.5ha area of Coleshill Sewage Works Grassland LWS required for the original scheme will reduce to 4.7ha as a result of the amendment. A 0.8ha area is no longer required. The amendment will result in a different significant effect on Coleshill Sewage Works Grassland LWS. However, this will not change the level of significance of the effect reported in the main ES.

5.1.121 Part 1 of the SES and AP2 ES reported the loss of 5.9ha from Coleshill Sludge Lagoons LWS (which was designated after the publication of the main ES) for the construction of the SES scheme (27% of the 21.8ha total LWS area). The SES reported an adverse effect on the integrity of Coleshill Sludge Lagoons LWS that will be significant at a county/metropolitan level. As such, the SES identified a requirement for additional compensation to address these adverse effects. The 5.9ha area of Coleshill Sludge Lagoons LWS required for the SES3 scheme will reduce to 4.6ha as a result of the amendment. A 1.3ha area is no longer required. The amendment will result in a different significant effect on Coleshill Sludge Lagoons LWS. However, this will not change the level of significance of the effect reported in the SES.

Habitats

5.1.122 The main ES reported that the loss of 5.5ha of grassland and rush pasture from within Coleshill Sewage Works Grassland LWS would result in a permanent adverse effect on the conservation status of these habitats that would be significant at up to a county/metropolitan level. The diversion of the overhead power line from the west of the route to the east of the route will result in a reduction of land required within the area of Coleshill Sewage Works Grassland LWS. The 5.5ha area of grassland and rush pasture required for the original scheme will reduce to 4.7ha as a result of the amendment. The amendment will result in a different significant effect on grassland and rush pasture within Coleshill Sewage Works Grassland LWS. However, this will not change the level of significance of the effects reported in the main ES.

5.1.123 The SES and AP2 ES (Part 1) reported that the scheme would result in the loss of 5.9ha of mosaic habitat within Coleshill Sewage Treatment Works. This loss of mosaic habitat to the SES scheme was reported to result in an adverse effect on the conservation status of the mosaic of habitats that would be significant at a district/borough level. The 5.9ha of mosaic habitat within Coleshill Sewage Treatment Works required for the SES3 scheme will reduce to 4.6ha as a result of the amendment. The amendment will result in a different significant effect on mosaic habitats within Coleshill Sludge Lagoons LWS. However, this will not change the level of significance of the effects reported in the SES.

5.1.124 The main ES reported an adverse effect on the conservation status of the River Tame, due to shading created by three viaducts that would be significant at the district/borough level. The River Tame is located within land required for the diversion of the overhead power line between Gilson and Hams Hall. The overhead power line will span the River Tame in this location but will not result in any shading or loss of habitat. The diversion of the overhead power line in this area will not give rise to any new or different significant effects on the River Tame and will not change the level of significance of the effects reported in the main ES.

5.1.125 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. Local/parish level effects which are in addition to those identified in the main ES and the SES and AP2 ES are listed in Volume 5: Appendix EC-003-003 of the SES3 and AP4 ES.

Protected and/or notable species

5.1.126 The main ES reported that the combined impacts of the loss of potential bat roosts and some loss of foraging areas due to the construction of the original scheme were unlikely to lead to a significant permanent adverse effect on the conservation status of the assemblage of bats using foraging and commuting habitats in areas of woodland within Coleshill Sewage Treatment Works and along the adjacent River Tame. Bats from this assemblage may utilise areas of habitat, such as trees for roosting, and tree lines and mosaic habitat for foraging and commuting that are assumed to be lost as a result of the amendment. These affected habitats are likely to represent a negligible area of the wider foraging and commuting resource and roosting provision that is available to this assemblage of bats. The land no longer required as a result of the amendment comprises similar habitat types and areas to those being lost. Overall the amendment will not result in a net loss of habitats suitable for roosting, foraging and commuting bats. These changes will not generate any different significant effects, or change the level of significance of effects reported in the main ES.

5.1.127 The main ES reported that the potential habitat loss, habitat severance and temporary disturbance during construction would cause a permanent adverse effect on the conservation status of a water vole population using ephemeral flooded pools within Coleshill Sewage Works Grassland LWS and possibly on the adjacent River Tame that will be significant at a county/metropolitan level. The diversion of the overhead power line will be required to span the River Tame over a stretch that is likely used by water voles. Taking a precautionary approach, the diversion of the overhead power line between Gilson and Hams Hall will result in the loss of 0.05ha of suitable water vole habitat along the River Tame. However, the diversion of the overhead power line means that the AP4 revised scheme will not require approximately 0.1ha of land used by the water vole population that was required for the original scheme in the Coleshill Sewage Works Grassland LWS. Overall, the amendment will not give rise to a new or different significant effect on water vole and will not change the level of significance of the effects reported in the main ES.

5.1.128 The main ES did not report any significant effects on the wintering populations of green sandpiper and gadwall within Coleshill Sewage Treatment Works as a result of the original scheme. No loss of suitable habitat for wintering green sandpiper or wintering gadwall will occur as a result of the amendment. In addition, areas of land no longer required for the AP4 revised scheme totalling approximately 2.2ha in area are located within the areas utilised by wintering green sandpiper and wintering gadwall. The amendment will not give rise to a new or different significant effect on wintering green sandpiper and wintering gadwall and will not change the level of significance of the effects reported in the main ES.

5.1.129 The main ES reported that the loss of seasonally flooded habitats within Coleshill Sewage Works Grassland LWS could lead to the loss of the associated populations of Warwickshire notable and rare plants that would have a permanent adverse effect on the conservation status of the assemblage of notable plants that will be significant at

a county/metropolitan level. Areas of land no longer required for the AP4 revised scheme totalling approximately 0.8ha in area are located within the seasonally flooded habitats of Coleshill Sewage Works Grassland LWS that support populations of Warwickshire notable and rare plants. The amendment will not give rise to a new or different significant effect on the assemblage of notable plants within Coleshill Sewage Works Grassland LWS and will not change the level of significance of the effects reported in the main ES.

5.1.130 It is unlikely that the amendment will result in any other new or different effects on species receptors of relevance at more than the local/parish level. Local/parish level effects which are in addition to those identified in the main ES and the SES and AP2 ES are listed in Volume 5: Appendix EC-003-003 of the SES3 and AP4 ES.

Cumulative effects

5.1.131 There are no new or different likely cumulative effects for ecology as a result of the AP4 amendment interacting with one another, the AP1 amendments; AP2 amendments or any relevant committed development.

Mitigation and residual effects

Other mitigation measures

5.1.132 Compensation for the losses within Coleshill Sewage Works Grassland LWS was included within the original scheme as species rich grassland along the realigned River Cole in the Coleshill Junction area. The AP4 revised scheme reduces loss within the LWS, and a 2.4ha area of the LWS that was permanently lost to the SES3 scheme will now only be required temporarily and will be restored to provide similar habitat types to those being lost on completion of the works in this area. The compensatory habitat creation in relation to Coleshill Sewage Works Grassland LWS and associated habitats is not changed by the amendment.

5.1.133 The SES and AP2 ES (Part 1) acknowledged that additional compensation was required to address adverse effects on the Coleshill Sludge Lagoons LWS and associated habitats. The AP4 amendment means that a 2.4ha area of the Coleshill Sludge Lagoons LWS that was to be permanently lost to the SES3 scheme will now only be temporarily required. As a consequence this 2.4ha area will in the AP4 revised scheme be restored to provide similar habitat types to those being lost at Coleshill Sludge Lagoons LWS.

5.1.134 In addition, to address the 2.4ha that will be permanently lost from the Coleshill Sludge Lagoons LWS as a result of the AP4 revised scheme, a 1.6ha grassland habitat creation area will be created as compensation. The area proposed for the grassland habitat creation is located between the eastern boundary of Coleshill Sludge Lagoons LWS and the River Tame (within CFA20). The habitat creation area will include a mosaic of grassland and wetland habitats and will be of greater value to wildlife than the habitats currently present. This compensation measure, along with the reduction in loss from the Coleshill Sludge Lagoons LWS and associated habitats due to the AP4 revised scheme will reduce the significant effects reported in the SES and AP2 ES (Part 1), Volume 2: CFAs 19 and 20, to a level that is not significant.

5.1.135 The habitat creation area will also act as a receptor site for water vole, should this species require translocation from Coleshill Sewage Works Grassland LWS as a result of early utilities work.

Summary of likely residual effects

5.1.136 With the implementation of the mitigation measures proposed within the Chattle Hill area amendment, the adverse residual effect on site integrity identified in the SES on the Coleshill Sludge Lagoons LWS is reduced from being significant at the county/metropolitan level to a level where it is not significant. The adverse residual effect on the associated mosaic of habitats within the Coleshill Sewage Treatment Works is also reduced from being significant at the district/borough level to a level where it is not significant.

5.1.137 No other new of different residual effects on ecological receptors occur as a consequence of the amendments compared to those reported in the main ES and SES and AP2 ES.

Effects arising from operation

Avoidance and mitigation measures

5.1.138 No avoidance and mitigation measures additional to those reported in the main ES are required.

Protected and/or notable species

5.1.139 The main ES reported that where the proposed route bisects, or is located in close proximity to existing features known to be utilised by foraging and commuting bats, there is an increased risk that bats could be killed or injured as a result of collisions with trains and associated turbulence. The significance of any such effect will be dependent on both the flight habitat of the species concerned and the vertical alignment of the original scheme. Avoidance and mitigation measures that were provided within the original scheme will maintain connectivity for bats, due to the presence of viaducts in the Coleshill Junction Area. The spaces beneath viaducts will offer animals a way of passing beneath the route of the proposed scheme and will reduce collisions with trains. Planting is designed to encourage species such as bats to use these crossing points. The main ES reported that although there is a risk of individual bats being killed or injured by collision with trains, the impacts are unlikely to result in significant effects on the conservation status of the species concerned, due to the provision of the viaducts in the Coleshill Junction area.

5.1.140 The AP4 revised scheme will allow the permanent provision of a pair of viaducts replacing the Watton House south embankment. No new land is required for this part of the amendment; however the provision of viaducts in this area will reduce the risk that bats could be killed or injured as a result of collisions with passing trains or associated turbulence. Additional landscape mitigation planting will be implemented in the area beneath and around the viaduct, which will have the benefit of encouraging bats to use this crossing point beneath the proposed viaduct. The amendment will not give rise to a new or different significant effect on the species of bats foraging and commuting within the Coleshill Junction area and will not change the level of significance of the effects reported in the main ES.

Cumulative effects

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

Mitigation and residual effects

Other mitigation measures

5.1.142 No additional mitigation measures (i.e. in addition to those identified in the main ES or SES and AP2 ES) are required.

Summary of likely residual effects

5.1.143 No new or different residual effects on ecological receptors occur as a consequence of the amendment. The significant residual effects of the AP4 revised scheme in this area are therefore unchanged from those reported in the main ES and SES and AP2 ES.

Land quality

Introduction

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

Scope, assumptions and limitations

5.1.145 The assessment scope, key assumptions and limitations for land quality 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.

Existing baseline

5.1.146 The existing baseline land quality information for the area is as described in the main ES (Volume 2, CFA19, Section 8).

5.1.147 The bedrock geology underlying the amendment area is the Mercia Mudstone Group, comprising mudstone with subordinate sandstone and siltstone. The Mercia Mudstone is classified by the Environment Agency as a Secondary B aquifer.

5.1.148 Superficial deposits present within the amendment area comprise Glaciofluvial Deposits and River Terrace Deposits (classified by the Environment Agency as a Secondary A aquifer), Glaciolacustrine Deposits (classified as unproductive strata), Alluvium comprising clay, silt, sand and gravel (classified by the Environment Agency as a Secondary A aquifer) and Head Deposits comprising clay, silt and gravel (classified by the Environment Agency as a Secondary (undifferentiated) aquifer).

5.1.149 The presence of made ground is not indicated on British Geological Survey (BGS) mapping, but there is likely to be made ground associated with existing highways, railway lines, numerous developments in the area including Coleshill Sewage Treatment Works and historical landfills.

5.1.150 A sand and gravel mineral safeguarding area (MSA) covers the area of the amendment, and the majority of the wider CFA19 assessment area.

Future baseline

Construction (2017)

5.1.151 The potential for the baseline to change in the lead up to the construction of the amendment is limited to the extent to which any new development necessitates remediation or mitigation measures to control potential contamination releases. Any new development in the study area on potentially contaminated land will need to be suitable for its intended use as set out in the National Planning Policy Framework). To meet this requirement new development, sites may require remediation to be undertaken. This will mean that some areas described as having potentially contaminative current and/or historical land use, may no longer be of significance at the time of construction.

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

5.1.153 None of the identified developments affect the assessment of the AP4 amendment's likely construction impacts on land quality.

Operation (2026)

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

5.1.155 None of the identified developments affect the assessment of the AP4 amendment's likely operational impacts on land quality.

Effects arising during construction

5.1.156 The following potentially contaminative land uses and effects arising during construction were identified in the main ES in the amendment area:

- Coleshill Industrial Estate, located in the area of permanent land required for the SES3 scheme (refer to main ES Volume 5: Map Book – Land quality, map LQ-01-055a, centred on C3), assessed as not posing a contaminative risk to the identified receptors;
- Coleshill Gas Works historical landfill intersected by the SES3 scheme (refer to main ES Volume 5: Map Book – Land quality, map LQ-01-055a, centred on A3), assessed as posing a negligible to minor adverse effect (not significant) to the identified receptors;
- Birmingham to Nuneaton railway line, intersected by the SES3 scheme (refer to main ES Volume 5: Map Book – Land quality, map LQ-01-55a, A6), assessed as posing a negligible (not significant) effect to the identified receptors;
- Coleshill Sewage Treatment Works, intersected by the SES3 scheme (refer to main ES Volume 5: Map Book – Land quality, map LQ-01-055a, centred on A4),

assessed as posing a minor adverse effect (not significant) to the identified receptors;

- Coleshill Water Reclamation Works historical landfill, located in the land required to construct the scheme (refer to main ES Volume 5: Map Book 16 – Land quality, map LQ-01-055a, A3), assessed as posing a negligible (not significant) effect to the identified receptors; and
- an infilled pond, intersected by the SES3 scheme (refer to main ES Volume 5: Map Book – Land quality, map LQ-01-055a, A6), assessed as posing a negligible to minor adverse effect (not significant) to the identified receptors.

5.1.157 With the amendment, Coleshill Water Reclamation Works historical landfill is located directly adjacent to, rather than within, the land required to construct the scheme and the identified effect is considered to remain negligible (non-significant) during construction. The identified effects for the remaining land uses summarised above are considered to remain the same, taking into account the amendment.

5.1.158 The land required for the amendment is located in a sand and gravel MSA. A negligible (not significant) temporary effect was anticipated on this MSA in the main ES and this effect is not anticipated to change with the amendment.

5.1.159 In summary, the proposed Chattle Hill area amendments will not give rise to new or different significant effects during construction and will not change the level of significance of the effects reported in the main ES.

Effects arising from operation

5.1.160 The amendment relates only to the construction phase and 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.

Mitigation and residual effects

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

5.1.162 The amendment does not give rise to any new or different residual significant effects.

Cumulative effects

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

Landscape and visual assessment

Introduction

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

Scope, assumptions and limitations

5.1.165 The assessment scope, key assumptions and limitations for the landscape and visual assessment are as set out in Volume 1, the SMR (Volume 5: Appendix CT-001-000/1) and the SMR Addendum (Volume 5: Appendix CT-001-000/2) of the main ES. Updates to the methodology for the landscape and visual assessment are also described in Volume 1 of the AP1 ES and Volume 1 of the SES and AP2 ES.

Existing baseline

5.1.166 The area of land required for the amendment is located within the Hams Hall Industrial and Distribution LCA and the Cole Valley LCA as described in the main ES (Volume 2, CFA19, Section 9 and (Volume 5, CFA19, Landscape Report LV-001-019).

5.1.167 Views west from residences at Chattle Hill and Gorsey Way (viewpoint 314.2.001), west from Coleshill Industrial Estate (viewpoint 314.6.002) and north-east from the B4117 Gilson Road (viewpoint 313.4.010) are located in close proximity to the area and are described in the main ES (Volume 2, CFA19, Section 9 and Volume 5, CFA19, Landscape Report LV-001-019).

Future baseline

Construction (2017)

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

5.1.169 None of the identified developments affect the assessment of the AP4 amendment's likely construction impacts on landscape character and views.

Operation (2026)

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

5.1.171 None of the identified developments affect the assessment of the AP4 amendment's likely operational impacts on landscape character and views.

Effects arising during construction

Landscape assessment

5.1.172 The Hams Hall Industrial and Distribution LCA and the Cole Valley LCA were assessed as being affected by the SES3 scheme and will also be affected by this amendment.

5.1.173 The Hams Hall Industrial Distribution LCA is characterised by large-scale industrial units, electrical substations and sewage works, infrastructure routes and overhead power lines. Vegetation is limited to road and rail corridors and alongside the River Tame. The landscape condition was reported in the main ES as fair, because the industrial units and ornamental landscape areas appear to be relatively well maintained. The main ES reported low tranquillity, due to the presence of heavy goods vehicles (HGVs), railway lines and overhead power lines. As an industrial area,

the LCA was reported in the main ES to be of local value. Therefore this LCA is considered to be of low sensitivity.

5.1.174 The Cole Valley LCA is predominantly rural and within designated green belt, with historic former parkland fragmented by subsequent development. The landscape condition was reported in the main ES as fair, due to the relatively well maintained appearance of woodlands and vegetation along the River Cole, transport corridors, and field boundaries. The main ES reported low tranquillity, due to the heavily trafficked major transport routes and the substantial levels of street lighting. As a result of green belt designation, the Cole Valley LCA was considered to be valued at a regional level. Therefore it is considered to be of medium sensitivity.

5.1.175 The main ES reported a minor adverse effect (not significant) during construction for the Hams Hall Industrial Distribution LCA, due to very minor loss at a local level of riverside vegetation, and the introduction of construction plant, haul roads and construction compounds, and construction activity.

5.1.176 For the Cole Valley LCA, the main ES reported a moderate adverse significant effect during construction due to the formation of large scale embankments and structures, partial loss of characteristic landscape features such as hedgerows, woodland, riverside vegetation and demolitions.

5.1.177 The construction activities related to the proposed amendment will further reduce tranquillity locally but are not considered to be substantive compared to the SES3 scheme. In the case of both the Hams Hall Distribution LCA and the Cole Valley LCA, the amendments will not give rise to a new or different significant effect and will not change the level of significance of the effects reported in the main ES.

Visual assessment

5.1.178 Viewpoint 314.2.001, 314.6.002 and 313.4.010 were assessed as being affected by the SES3 scheme and will also be affected by the amendment. The main ES reported moderate adverse significant effects on viewpoints 314.2.001 and 314.6.002, and a major adverse effect on the view from viewpoint 313.4.010 during construction due to the construction of viaducts, embankments, realignment of an overhead power line, and the Chattle Hill box structure, and visibility of hoardings and the Chattle Hill box structure satellite compound.

5.1.179 With respect to viewpoint 313.4.010, the amendment relates to underground utilities diversions, which are to be undertaken in advance of the peak construction phase. Compared to the peak construction phase 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.

5.1.180 The extension of the south-east wall to the Chattle Hill box structure will alter the view from viewpoint 314.2.001 during construction and this will give rise to a different significant effect. The diversion of overhead power lines and resulting change to the arrangement of pylons, from that of the SES3 scheme, will be seen in the foreground during the construction period. However, this will not change the level of significance of the effect reported in the main ES.

5.1.181 The main ES reported substantial change within the direct frame of view from viewpoint 314.6.002, as a result of the formation of the approach embankments, the

Chattle Hill box structure and associated satellite compound. The amendment replaces the proposed embankment with viaducts; the changes within the direct frame of view remain substantial and therefore will give rise to a different significant effect. However, this will not change the level of significance of the effects reported in the main ES.

Effects arising from operation

Landscape assessment

5.1.182 The Hams Hall Industrial and Distribution LCA and the Cole Valley LCA were assessed as being affected by the SES3 scheme, and will also be affected by this amendment. The Hams Hall Industrial Distribution LCA is characterised by large-scale industrial units, electrical substations and sewage works, infrastructure routes and overhead power lines. Vegetation is limited to road and rail corridors and alongside the River Tame. The landscape condition was reported in the main ES as fair, because the industrial units and ornamental landscape areas appear to be relatively well maintained. The main ES reported low tranquillity due to the presence of HGVs, railway lines and overhead power lines. As an industrial area, the LCA was reported in the main ES to be of local value. Therefore this LCA is considered to be of low sensitivity.

5.1.183 The Cole Valley LCA is predominantly rural and within designated green belt, with historic former parkland fragmented by subsequent development. The landscape condition was reported in the main ES as fair, due to the relatively well maintained appearance of woodlands, and vegetation along the River Cole, transport corridors and field boundaries. The main ES reported low tranquillity, due to the heavily trafficked major transport routes and the substantial levels of street lighting. As a result of green belt designation, the Cole Valley LCA was considered to be valued at a regional level. Therefore this LCA is considered to be of medium sensitivity.

5.1.184 The main ES reported a negligible effect for the Hams Hall Industrial Distribution LCA at year 1 of operation due to the introduction of an additional rail line that is of a more prominent scale than the existing Birmingham and Derby line, the introduction of embankments and the River Tame viaduct. No further change was assessed for the Hams Hall Industrial and Distribution LCA at years 15 and 60.

5.1.185 The main ES reported a moderate adverse significant effect on the Cole Valley LCA during year 1 of operation due to the introduction of large-scale infrastructure, realignments of the River Cole and existing infrastructure including Manor Drive, and partial loss of characteristic landscape features. By year 15, planting would have established and matured sufficiently to aid integration of the new elements and further reflect the existing landscape character, reducing the effects to non-significant.

5.1.186 Whilst the amendment will alter the arrangement of landscape elements in the Hams Hall Industrial Distribution LCA and Cole Valley LCA, these changes are not considered to be substantive. The amendment will not give rise to a new or different significant effect and will not change the level of significance of the effects reported in the main ES.

Visual assessment

5.1.187 Viewpoints 314.2.001 and 314.6.002 were assessed as being affected by the SES3 scheme, and will also be affected by the amendment. The main ES reported a moderate adverse significant effect on viewpoint 314.2.001 in year 1 of operation due to visibility of the passing trains and overhead line equipment, the Chattle Hill box structure and the embankment to the south which would be visible in the middle ground of the view. This was reported as reducing to non-significant by year 15 as a result of the planting establishing and maturing.

5.1.188 The amendment will alter the view from viewpoint 314.2.001 during year 1 of operation, as a result of the reduction of grassed embankment, the extension of the south-east wall to the Chattle Hill box structure, the diversion of overhead power lines and associated change to the arrangement of pylons, from that of the SES3 scheme. The view of the AP4 revised scheme from this viewpoint, in the winter of year one of operation, is illustrated on the photomontage in Figure LV-01-127 (SES3 and AP4 ES, Volume 2, CFA 19: Map Book). The marginal difference in this view over the SES3 scheme will give rise to a different significant effect, however will not change the level of significance reported in the main ES. As previously reported in the main ES, the effect would reduce to non-significant by year 15 as a result of the planting establishing and maturing.

5.1.189 Viewpoint 314.6.002: view west from Coleshill Industrial Estate, was assessed in the main ES as receiving a moderate adverse effect in year 1, arising from the visibility of passing trains and overhead line equipment on the main line Chattle Hill box structure and railway embankment, which were described as being highly visible in the foreground of the view. The main ES reported that the open and direct views of the Chattle Hill box structure and railway embankment from this viewpoint would remain unchanged by year 15 due to a lack of intervening elements.

5.1.190 The amendment will alter the view from viewpoint 314.6.002 at year 1 of operation, due to the replacement of embankment by viaducts which will provide views beneath the viaduct at year 1 of operation. The viaducts will be highly visible in the foreground of the view and passing trains and overhead line equipment will be visible. The amendment will give rise to a marginal improvement in this view over the SES3 scheme, and will be a different significant effect. However, this will not change the level of significance of the effects reported in the main ES.

5.1.191 The amendment includes additional landscape mitigation planting around the viaduct. From viewpoint 314.6.002 at year 15, the passing trains, overhead line equipment and viaducts would be partially filtered by the maturing vegetation. By year 60, the planting would have established and matured, and largely filter views of the viaducts, passing trains and overhead lines, reducing the effect to non-significant. The amendment will give rise to an improvement to this viewpoint from the SES3 scheme and will be a different significant effect at year 15 of operation, however it will not change the level of significance of effects reported in the main ES.

Mitigation and residual effects

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

5.1.193 There are no new residual construction or operational landscape and visual effects as a result of the amendment in comparison with the main ES. The amendment will give rise to different residual significant effects during both construction and operation.

5.1.194 Viewpoints 314.2.001 and 314.6.002 will both have altered views during construction as a result of the amendment, resulting in different significant effects. This will not change the level of significance of effects reported in the main ES.

5.1.195 The amendment includes additional landscape mitigation planting around the viaduct which will give rise to an improvement to viewpoint 314.6.002 at year 15 which will be a different operational significant effect. This will not change the level of significance of effects reported in the main ES.

Cumulative effects

5.1.196 There are no new or different likely significant cumulative effects for landscape character and views as a result of the AP4 amendments interacting with one another, the AP2 amendments or any relevant committed development.

Socio-economics

Introduction

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

Scope, assumptions and limitations

5.1.198 The assessment scope, key assumptions and limitations for socio-economics 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

5.1.199 The baseline socio-economics information for CFA 19 Coleshill Junction is described in the main ES (Volume 2, CFA Report 19, Section 10).

Future baseline Construction (2017)

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

5.1.201 None of the identified developments affect the assessment of the AP4 amendment's likely construction impacts on socio-economics.

Operation (2026)

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

5.1.203 None of the identified developments affect the assessment of the AP4 amendment's likely operational impacts on socio-economics.

Effects arising during construction

5.1.204 The SES3 and AP4 ES (Part 1) identified that the demolition of a recent extension to the Highway Point building, used by a manufacturing business, would result in a significant effect on the business and its employees. It has also been identified that the original scheme would have resulted in restricted access to the business for a period of approximately 6 months during construction of the scheme.

5.1.205 This amendment includes the design change from an embankment to a viaduct and the rerouting of a high-pressure gas main which will allow the business to remain functional. The amendment will result in retention of access to the site throughout the construction phase.

5.1.206 Whilst the impact on the business will be reduced as a result of the amendment, it will not generate new or different significant effects and does not change the level of significance of the effects reported in SES3.

Effects arising from operation

5.1.207 No significant operational socio-economic effects were reported in the main ES, and there are no new or different significant effects as a result of the amendment.

Mitigation and residual effects

5.1.208 HS2 Ltd is working with the business to understand the impact of the works and how these might be mitigated in accordance with the provisions of the Compensation Code.

5.1.209 The amendment will not result in any new or different significant residual effects during construction or operation at this location, and will not change the level of significance of the effects reported in SES3.

Cumulative effects

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

Sound, noise and vibration

Introduction

5.1.211 This section of the report describes the environmental baseline in relation to sound, noise and vibration that is relevant to the assessment. It then identifies any new or different likely significant environmental effects as a result of the amendment compared to those of the SES3 scheme.

Scope, assumptions and limitations

5.1.212 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.

5.1.213 Local assumptions and limitations for sound, noise and vibration are set out in main ES Volume 2, CFA19, Section 11.

Existing baseline

5.1.214 The baseline sound, noise and vibration information for CFA19 is described in the main ES (Volume 2, CFA19, Section 11.2). Baseline sound levels representative of the assessment locations affected by this amendment have been used in the construction and operational sound, noise and vibration assessments.

Future baseline

5.1.215 Without the original scheme, existing sound levels in this area are likely to increase gradually over time. This is primarily due to road traffic growth on the existing road network. Changes in car technology may offset some of the expected sound level increases due to traffic growth on low speed roads. On higher speed roads, tyre sound dominates overall levels and hence the expected growth in traffic is likely to continue to increase ambient sound levels.

Construction (2017)

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

5.1.217 None of the identified developments affect the assessment of the AP4 amendment's likely construction noise and vibration impacts.

Operation (2026)

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

5.1.219 None of the identified developments affect the assessment of the AP4 amendment's likely operational noise and vibration impacts.

Effects arising during construction

5.1.220 In the vicinity of the amendment the main ES reported a likely significant effect on a group of approximately thirteen dwellings on Gilson Road and Meadowbank Drive, Gilson (CSV-019-C02) due to ground engineering activities associated with the Gilson cutting and Gilson embankment.

5.1.221 On a reasonable worst-case basis, a temporary significant construction noise effect was also identified in the main ES at commercial properties located on the western edge of the Coleshill Industrial Estate, Coleshill (CSV-019-N01) and in close proximity to the construction works.

5.1.222 The amendment will alter the intervening distances between construction activities and receptors, which has the potential to alter the reported effects in the Gilson and Coleshill areas.

5.1.223 An assessment has been undertaken to determine whether the AP4 amendments would result in any new or different significant effects in comparison to the main ES, using the significance criteria detailed in the main ES (Volume 5: Appendix SV-001-000).

5.1.224 This assessment has determined that there is a change to construction noise levels at commercial properties located on the western edge of the Coleshill Industrial Estate (ID 130843) where the AP4 revised scheme has altered the assessment outcome reported in the main ES. Table 7 sets out the changes to the main ES, Volume 5: Appendix SV-003-019, construction assessment, sound, noise and vibration for both residential and non-residential receptors.

5.1.225 Explanation of the information within this table is provided in the main ES, Volume 5: Appendix SV-003-019.

Table 7: Assessment of construction noise at residential receptors and non-residential receptors

Assessment location		Impact criteria				Significance criteria									Significant effect
ID	Area represented	Typical/highest monthly outdoor LpAeq [dB] at the facade [Assessment category A/B/C]			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
130843	General Commercial, Coleshill Industrial Estate, Gorsey Lane	68/76	-	-	Viaduct Superstructure	B[4]	5	G[5]5	T[6]	-	-	-	19	-	CSV19-N01

5.1.226 The amendment will give rise to a different significant effect, on a reasonably foreseeable worst-case basis, on the commercial properties located on the western edge of the Coleshill Industrial Estate (CSV19-N01) compared to that reported in the main ES. The construction works associated with the amendment leads to a reduction in the construction noise levels from a highest monthly noise level of 81dB reported in the main ES to 76dB, but an increased duration of the adverse effects at the commercial properties (from 16 months in the main ES to 19 months). This change is considered to create a different significant effect. HS2 Ltd will continue to engage with the owners and tenants of the buildings in order to identify all reasonably practicable measures to further reduce or avoid this significant effect.

5.1.227 For all other receptors, the amendment does not affect the predicted construction noise levels, and the likely significant effects identified in the main ES remain.

Effects arising during operation

5.1.228 The amendment includes changing sections of the route from embankment to viaduct. This has implications for the operational noise assessment as the sound radiated from a viaduct differs to that from an embankment. The viaduct standard design includes a short concrete up-stand which provides some sound attenuation. At

[4] B – Type of effect for non-residential receptors. Further detail about the type of effect is set out in the text of Volume 5: Appendix SV-001-000.
[5] G – Type of receptor – (G5) offices and general commercial premises.
[6] T – Receptor design – typical.

the properties next to the new viaducts, the increased level of noise radiated from the structure is more than offset by the reduction in train noise provided by the concrete up-stand incorporated into the standard viaduct design.

5.1.229 The amendment does not result in any new or different operational sound, noise or vibration effects compared to those reported in the main ES, SES and AP2 ES.

Mitigation and residual effects

Construction

5.1.230 The assessment of construction noise and vibration assumes the implementation of the principles and management processes set out in the draft CoCP (Volume 5: Appendix CT-003-000).

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

5.1.232 The amendment will give rise to a different significant effect, on a reasonably foreseeable worst-case basis, on the commercial properties located on the western edge of the Coleshill Industrial Estate (CSV19-N01) compared to the effects reported in the main ES. The construction works associated with the amendment lead to a reduction in the construction noise levels from a highest monthly noise level of 81dB reported in the main ES to 76dB, but an increased duration of the adverse effects at the commercial properties (from 16 months in the main ES to 19 months).

Operation

5.1.233 The proposed mitigation is identified within the main ES, CFA19, Volume 2, Section 11.

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

5.1.235 The amendment will not give rise to new or different residual significant effects and will not change the level of significance of the effects for sound, noise and vibration during operation reported in the main ES, SES and AP2 ES.

Cumulative effects

5.1.236 There are no new or different likely significant cumulative effects for sound, noise and vibration as a result of the AP4 amendments interacting with one another, the AP1, amendments, AP2 amendments, or any relevant committed development.

Traffic and transport

Introduction

5.1.237 This section of the report describes the environmental baseline in relation to traffic and transport that is relevant to the assessment. It then identifies any new or different likely significant environmental effects as a result of the amendment, compared to the SES3 scheme, taking into account any relevant AP2 amendments.

Scope, assumptions and limitations

5.1.238 The assessment scope, key assumptions and limitations of the traffic and transport assessment are set out in Volume 1, the SMR (Volume 5: Appendix CT-0001-000/1) and the SMR Addendum (Volume 5: Appendix CT-0001-000/2) of the main ES.

Environmental baseline

Existing Baseline

5.1.239 The existing baseline is as described in the main ES (Volume 2 CFA19, Section 12) and in Volume 5 Part 2 (TR-001-000) of the main ES as updated in the SES and AP2 ES.

5.1.240 The baseline analysis determined existing traffic flows along the A446 Lichfield Road at 22,000 vehicles per day.

Future baseline

Construction

5.1.241 The future baseline for traffic and transport is as described in Volume 2, CFA19, Section 12 of the main ES as updated by the SES and AP2 ES Volume 2, CFA19, Section 3.

5.1.242 The future baseline analysis for 2021 determined traffic flows along the A446 Lichfield Road at 25,000 vehicles per day.

Operation (2026 and 2041)

5.1.243 The future baselines for traffic and transport are set out in Volume 2, CFA19, Section 12 of the main ES as updated by the SES and AP2 ES, Volume 2 CFA19, Section 3.

Effects arising during construction

5.1.244 The amendments relate to a number of changes including utility diversions, modifications to viaducts and embankments and other changes to allow sufficient clearance and flexibility for potential future widening, by the highway authority, of the A446 Lichfield Road. The utility diversions can be undertaken using trenchless methods and other techniques to keep the A446 Lichfield Road open to traffic during the works. There are no significant changes to road layouts or accesses in the area due to these amendments.

5.1.245 In undertaking these amendments, construction traffic levels from the Water Orton Viaduct 1 and 3 (north) satellite compound, from which the works will be constructed, will increase in its peak month of construction by 40 HGVs per day. This will not generate any new or different traffic congestion or other traffic and transport effects from those reported in SES3.

Effects arising from operation

5.1.246 As the change relates to the construction phase only, the amendment will not give rise to a new or different operational effect and will not change the level of significance of the effects reported in the main ES, the SES and AP2 ES (Part 1) and SES3.

Mitigation and residual effects

5.1.247 No changes to the mitigation described in the main ES (Volume 2 CFA19, Section 12).

5.1.248 There are no new or different significant effects for traffic and transport as a result of the proposed amendment, in comparison with SES3.

Cumulative effects

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

5.1.250 There are no new or different likely significant cumulative effects for traffic and transport as a result of AP4 amendments interacting with one another or AP2 amendments.

Water resources and flood risk assessment

Introduction

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

Scope, assumptions and limitations

5.1.252 The assessment scope, key assumptions and limitations for water 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.

Existing baseline

5.1.253 The water resources and flood risk 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 is provided in the main ES, CFA19, Volume 2, Section 13.

5.1.254 The flood risk information includes the Environment Agency fluvial flood maps and the updated Flood Maps for Surface Water (uFMfSW). This mapping indicates that the areas for the amendments to the scheme are generally within an area at low risk from fluvial and surface flooding, with an annual probability of flooding less than 1 in 1000 (0.1%). There are small areas of slightly higher risk that are unlikely to have a significant impact on the scheme.

Future baseline

Construction (2017)

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

5.1.256 None of the identified developments affect the assessment of the AP4 amendment's likely construction impacts on water resources and flood risk assessment.

Operation (2026)

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

5.1.258 None of the identified developments affect the assessment of the AP4 amendment's likely operational impacts on water resources and flood risk assessment.

Effects arising during construction

5.1.259 The principal impacts of concern to water resources and flood risk in respect to the amendment are associated with the amendment to the Watton House south embankment. The change from embankment to viaduct will require alteration to the drainage design. As described in the main ES, drainage will be managed using sustainable drainage techniques and discharges will be restricted by the proposed balancing ponds to reduce run off to greenfield rates. The revised drainage will also adhere to these principles therefore there is no change in the impact due to the amendments.

5.1.260 Temporary construction works will be carried out in accordance with the requirements of the draft CoCP and will therefore take surface water flood risk into account. Implementation of mitigation measures in accordance with the draft CoCP will reduce the risks associated with surface water runoff during the construction phase.

5.1.261 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.

Effects arising from operation

5.1.262 The amendment will not give rise to a new or different significant effect and will not change the level of significance of the operational effects reported in the main ES.

Mitigation and residual effects

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

5.1.264 There are no likely residual significant effects of the amendment on water resources and flood risk.

Cumulative effects

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

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

5.1.266 With the implementation of the mitigation measures proposed within the Chattle Hill area amendment, the adverse residual ecological effect on site integrity identified in

the SES on the Coleshill Sludge Lagoons LWS is reduced from being significant at the county/metropolitan level to a level where it is not significant. The adverse residual effect on the associated mosaic of habitats within the Coleshill Sewage Treatment Works is also reduced from being significant at the district/borough level to a level where it is not significant.

5.1.267 The amendment includes additional landscape mitigation planting around the viaduct, which will give rise to an improvement to viewpoint 314.6.002 at year 15, which will be a different significant effect. This will not change the level of significance of effects reported in the main ES.

5.1.268 Viewpoints 314.2.001 and 314.6.002 will both have altered views during construction as a result of the amendment, resulting in different significant effects. This will not change the level of significance of effects reported in the main ES.

5.1.269 The amendment will give rise to a different significant sound, noise and vibration effect, on a reasonably foreseeable worst-case basis, on the commercial properties located on the western edge of the Coleshill Industrial Estate (CSV19-N01) compared to that reported in the main ES. The construction works associated with the amendment lead to a reduction in the construction noise levels from a highest monthly noise level of 81dB reported in the main ES to 76dB but an increased duration of the adverse effects at the commercial properties (from 16 months in the main ES to 19 months).

5.2 Relocation of Water Orton Primary School (AP4-019-002)

5.2.1 The Bill provides for construction works that necessitate the permanent loss of an area of playing field at Water Orton Primary School, which is currently situated on Attleboro Lane, Water Orton. The Bill provides an area of land for replacement playing fields adjoining the existing school grounds to the south-east (main ES Volume 2: CFA19 Map Book, map CT-06-134a,F5).

5.2.2 The Bill also provides for noise barriers to the south of Water Orton Primary School to reduce noise levels within the school grounds during the construction of the scheme. The proposed noise barriers would also provide visual screening during construction.

5.2.3 Water Orton Primary School currently has about 315 pupils and its priority catchment area includes the entire village. The priority catchment area also extends just to the east of the M42, to include a small number of properties either side of the A446 Lichfield Road to the north of Coleshill. Facilities at the school, including its playing fields, are also hired during evenings, weekends and during holiday periods by other community groups and organisations. There is also a day nursery that operates from the site, The Tree House of Water Orton, which is currently attended by about 170 children.

5.2.4 Since submission of the Bill, there have been ongoing discussions with the local education authority which has indicated a strong preference for relocating the school rather than mitigating the existing school against the noise and visual effects of construction. An alternative site to which the school will be relocated has been identified by the local education authority. The site identified for the relocated school is on Plank Lane within Water Orton village, 150m north-west of its current location (Volume 2: CFA19 Map Book, map CT-06-134a, D2-D3, E2-E3). As a result of the

relocation of the school to the new site, and assuming that the former school site will not be occupied during the construction works, the mitigation described in the main ES will no longer be provided at the former school site.

5.2.5 The proposed site is bounded to the east by existing housing located off Plank Lane and to the south by Plank Lane. There are fields to the west and north. The site incorporates an area of copse and other mature trees. Footpath M40 crosses the eastern part of the site.

5.2.6 It is assumed that the replacement school will be a two-form entry primary school with nursery provision. The capacity of the proposed school will remain the same as the existing school. For the purposes of the assessment, it is assumed that the site will include a new school building (assumed to be two storey on a reasonable worst-case basis), parking facilities, drop-off, delivery and turning facilities, a school playground, sports pitch and hard games court.

5.2.7 Footpath M40 will be diverted along the eastern site boundary, approximately 10m to the east. The diverted length of the footpath is approximately 150m, increasing its length by 20m.

5.2.8 It is assumed that the area of copse in the south-west of the land required for the amendment will be retained for use by the school, except for where vegetation needs to be removed to create the access to the site. Some replacement tree planting will be provided within the scheme design. The mature trees on site will be retained if possible; this will be confirmed during detailed design. However, for the purposes of this ES, on a precautionary basis it is assumed that the trees will be removed.

5.2.9 The replacement school is proposed to be constructed ahead of the main HS2 construction phase in this area. Construction activity for the school is expected to take approximately 15 months. The existing school is expected to be vacated in the summer holidays of 2019, with the new school opening in September 2019.

5.2.10 Approximately 3.1ha of additional permanent land is required.

5.2.11 In considering the relocation of the school, the local education authority sought to ensure that the new school would be within the existing priority catchment area, within the village of Water Orton. The local education authority has investigated the options for sites within Water Orton. Sites to the west of the priority catchment area were considered unsuitable as they are close to the existing rail line and proposed HS2 route; sites to the south were considered unsuitable as they are close to the proposed HS2 route; sites to the east are also close to the proposed HS2 route and M42 motorway; sites to the north were considered unsuitable as they are too remote and are close to a rail line and busy local roads.

5.2.12 The preferred site is central to the priority catchment area for the school, is easily accessible along lit pedestrian footpaths, is within walking distance for the whole of the priority area and is within walking distance of other local community provision such as the library, parish church and recreation grounds.

Topics to be included in the assessment

5.2.13 The relocation of Water Orton Primary School is not considered to make changes that require a reassessment of the environmental effects or proposed mitigation as set out

in the main ES and SES and AP2 ES with respect to socio-economics. However, there were changes where reassessment was considered to be required in respect of: agriculture, forestry and soils, air quality, community, cultural heritage, ecology, land quality, landscape and visual assessment, sound, noise and vibration, traffic and transport, and water resources and flood risk assessment.

Agriculture, forestry and soils

Introduction

5.2.14 This section of the report describes the environmental baseline in relation to agriculture, forestry and soil that is relevant to the assessment. It then identifies any new or different likely significant environmental effects as a result of the amendment, compared to those of the SES3 scheme.

Scope, assumptions and limitations

5.2.15 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.

5.2.16 The area of agricultural land affected by the amendment is relatively small (3.1ha) and therefore will not alter the significance of effect, or result in a different effect, on BMV agricultural land or forestry land within the CFA19 area. The route-wide effects on BMV land and forestry land are reported in Volume 3.

Existing baseline

5.2.17 The amendment will directly affect a single parcel of land in CFA19 which is part of Wiggins Hill Farm (CFA21/3), where the main farm hub and majority of the land is located in CFA21. The holding is a predominantly arable enterprise with a medium sensitivity to change covering an area of 323.8ha. The holding also includes the affected parcel of land in CFA19, used for grazing and making silage or hay.

Future baseline

Construction (2017)

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

5.2.19 None of the identified developments affect the assessment of the AP4 amendment's likely construction impacts on agriculture, forestry and soils.

5.2.20 Most existing environmental stewardship agreements will expire in 2015 and will be replaced by a new environmental land management scheme (countryside stewardship) which, together with the new greening measures introduced by Common Agricultural Policy reform, will affect the detailed management of individual farm holdings, but are not expected to change fundamentally the baseline circumstances described.

Operation (2026)

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

5.2.22 None of the identified developments affect the assessment of the AP4 amendment's likely operational impacts on agriculture, forestry and soils.

Effects arising during construction

5.2.23 This amendment will require an additional 3.1ha of land permanently from Wiggins Hill Farm. This will increase the total amount of land required permanently from 8.8ha (or 3% of the holding) to 11.9ha (4%). This will not change the level of significance of effects reported in the main ES, which remains as negligible (not significant).

Effects arising from operation

5.2.24 There are no new or different significant operational effects for agriculture, forestry and soils as a result of the proposed amendment in comparison with the main ES.

Mitigation and residual effects

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

5.2.26 The amendment will not result in any change in the likely residual significant effects reported in the main ES.

Cumulative effects

5.2.27 There are no new or different likely significant cumulative effects for agriculture, forestry and soils as a result of the AP4 amendments interacting with one another, the AP2 amendments, or any relevant committed development.

5.2.28 However, an amendment brought forward as part of AP2 also affects Wiggins Hill Farm. Amendment AP2-021-002 (additional land between Drayton Lane and Coppice Lane) does not require any additional land permanently from Wiggins Hill Farm, but does require an additional 0.4ha of land temporarily, in comparison to both the SES and SES3 schemes. Therefore, in combination with AP4-019-002, these two amendments will require an additional 0.4ha temporarily and 3.1ha permanently, in comparison to the SES3 scheme. However, the cumulative effect of AP2-021-002 in combination with AP4-019-002 will not result in a new or different significant effect on this holding, or change the level of significance of effects reported in the main ES or SES and AP2 ES, which remain as negligible temporary and permanent effects, which is not significant.

Air quality

Introduction

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

Scope, assumptions and limitations

5.2.30 The assessment scope, key assumptions and limitations and the methodology for determining significance of effects for air quality are set out in the SMR Addendum 3 (Volume 5: Appendix CT-001-000/4) of the SES2 and AP3 ES.

5.2.31 The assessment of the AP4 revised scheme has assumed that the general measures detailed in Section 7 of the draft CoCP (Volume 5: Appendix CT-003-000) of the main ES will be implemented.

Existing baseline

5.2.32 The baseline air quality conditions with regard to air quality have not changed from those reported in the main ES.

5.2.33 Receptors relevant to the amendment that could potentially be affected by changes in air quality include residential properties on Attleboro Lane, Water Orton; Vicarage Lane, Water Orton; and Plank Lane, Water Orton.

5.2.34 There are no statutory or non-statutory designated sites that could potentially be affected by changes in air quality as a result of the amendment.

Future baseline

Construction (2017)

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

5.2.36 None of the identified developments affect the assessment of the AP4 amendment's likely construction impacts on air quality.

5.2.37 The relocation of Water Orton Primary School as part of the amendment introduces a new receptor for the assessment of effects on air quality during the main HS2 construction works.

Operation (2026)

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

5.2.39 None of the identified developments affect the assessment of the AP4 amendment's likely operational impacts on air quality.

5.2.40 The relocation of Water Orton Primary School as part of the amendment introduces a new receptor for the assessment of effects on air quality during the operation of HS2.

Effects arising during construction

5.2.41 An assessment has been undertaken for receptors sensitive to dust, soiling and human health effects located close to dust generating activities from construction of the amendment.

5.2.42 The construction dust assessment has taken into consideration changes to the magnitude of dust emissions for the dust generating activities associated with the amendment and the sensitivity of the surrounding area, in terms of the receptors present and the distance of the receptors from the construction activities.

5.2.43 The amendment does not change the magnitude of the activities during the construction phase in terms of dust generating potential or the footprint of the works from that reported in the main ES for the relevant receptors around Attleboro Lane.

5.2.44 The proposed amendment will result in a low risk of construction dust impacts. With the implementation of the measures contained within the draft CoCP (Volume 5: Appendix CT-003-000), no significant effects are anticipated from dust generating activities at this location.

5.2.45 The amendment includes new earthworks and construction activities and changes the distance of these activities relative to the relevant receptors. An assessment of dust impacts has been undertaken at existing properties on Plank Lane, Water Orton, which were not previously considered in the main ES. The amendment will result in a low to medium risk of construction dust impacts. With the implementation of the measures contained within the draft CoCP (Volume 5: Appendix CT-003-000), no significant effects are anticipated from dust generating activities at this location.

5.2.46 The amendment introduces a new receptor relevant to air quality (Water Orton Primary School) to an area where there is the potential for dust emission impacts, from HS2 construction activities. An assessment of dust impacts has been undertaken at the proposed site of Water Orton Primary School, which was not previously considered in the main ES. The amendment will result in a low risk of construction dust impacts. With the implementation of the measures contained within the draft CoCP (Volume 5: Appendix CT-003-000), no significant effects are anticipated from dust generating activities at this location.

5.2.47 The amendment is not considered to make changes to traffic flows and road alignments that require reassessment of air quality impacts from construction traffic.

5.2.48 The proposed amendment will not give rise to any new or different significant effects during construction and will not change the level of significance of the effects reported in the main ES (Volume 2, CFA19, Section 4).

Effects arising from operation

5.2.49 The proposed amendment will not give rise to new or different significant effects and will not change the level of significance of the effects reported in the main ES for air quality (Volume 2, CFA19, Section 4).

Mitigation and residual effects

5.2.50 Emissions to the atmosphere will be controlled and managed during construction through the route-wide implementation of the CoCP.

5.2.51 No additional avoidance and mitigation measures (i.e. in addition to those identified in the main ES) are required during construction.

5.2.52 As reported in the main ES no mitigation measures are required during operation in relation to air quality.

5.2.53 The proposed amendment will not give rise to new or different residual significant effects and will not change the level of significance of the effects reported in the main ES.

Cumulative effects

5.2.54 There are no new or different likely significant cumulative effects for air quality as a result of the proposed AP4 amendments acting in combination with one another, the AP1 amendments, AP2 amendments, or any relevant committed development.

Community

Introduction

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

Scope, assumptions and limitations

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

5.2.57 It is assumed the relocated school will provide the same community and school uses as the existing school, including facilities for community groups and space for combined pre-school and out of hours' child care facility.

Existing baseline

5.2.58 As described in the main ES (Volume 2, CFA Report 19, Section 5), Water Orton village is located to the north and west of the scheme. It has a good range of facilities and the centre of the village is outside the land required for construction and operation of the scheme, although properties and facilities on the south side of the village, including Water Orton Primary School, fall within it.

5.2.59 The Water Orton Primary School has about 315 pupils, and its priority catchment area includes the entire village and also extends just to the east of the M42, to include a small number of properties either side of the A446 Lichfield Road to the north of Coleshill. In January 2013, the majority of pupils on the school roll came from within Water Orton, 15% of pupils came from Solihull Metropolitan Borough Council area to the south-west and 8% from Gilson or Coleshill to the south-east.

5.2.60 The site identified for the relocated Water Orton Primary School is on Plank Lane within Water Orton village, 150m north-west of its current location and further from the HS2 route. The proposed site is bounded to the east by existing housing located off Plank Lane and to the south by Plank Lane.

Future baseline

Construction (2017)

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

5.2.62 None of the identified developments affect the assessment of the AP4 amendment's likely construction impacts on community.

5.2.63 The relocation of Water Orton Primary School as part of the amendment introduces a new receptor for the assessment of community effects during the main HS2 construction works.

Operation (2026)

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

5.2.65 None of the identified developments affect the assessment of the AP4 amendment's likely operational impacts on community.

5.2.66 The relocation of Water Orton Primary School as part of the amendment introduces a new receptor for the assessment of community effects during the operation of HS2.

Effects arising during construction

5.2.67 The amendment (AP-019-002) will create a new community receptor, the relocated Water Orton Primary School. The new school will experience the same moderate adverse significant isolation effects as the existing school, due to congestion and delay on routes from the wider area to the school as reported in the main ES, as pupils will be drawn from the same catchment areas. The amendment will not give to any new or different significant effects as the isolation effect on users of the school will remain unchanged.

5.2.68 The construction proposed by the amendment will generate amenity effects on nearby residential receptors during construction. Properties directly to the east of the proposed school relocation site at Plank Lane, Long Leys Croft and Mickle Meadow will be affected by new noise effects during construction. These properties will also experience major significant visual effects as the school is constructed. As a result, the proposed amendment will give rise to a new amenity impact on this residential receptor composed of 11 properties for up to 10 months during the construction of the school. This will result in a new major adverse significant amenity effect, not previously reported in the main ES (refer to SES3 and AP4, Volume 5, map CM-019-124). An update to the main ES, Volume 5, Appendix CM-001-019 assessment table is included in Table 8.

Effects arising from operation

5.2.69 There have been no significant operational effects identified for the traffic, sound, noise and vibration or air quality topics arising from the day-to-day operation of the school. Although a significant effect has been identified through the visual

assessment, this effect is not in combination with any other effect and therefore no amenity effect associated with school operation has been identified.

5.2.70 The proposed 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.

Mitigation and residual effects

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

5.2.72 The construction of the school would result in residual amenity effects on residents living directly to the east of the site on Plank Lane, Long Leys Croft and Mickle Meadow (11 properties), assessed as major adverse significant, for a period of up to 10 months.

Cumulative effects

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

Volume 5 amendments

5.2.74 Table 8 sets out the updates to the main ES, Volume 5, Appendix CM-001-019, as a result of the proposed amendment.

Table 8: 151 to 161 Plank Lane, 1 to 7 Long Leys Croft, and 19 Mickle Meadow, Water Orton community impact assessment record sheet

Resource name	**151 to 161 Plank Lane, 1 to 7 Long Leys Croft, and 19 Mickle Meadow, Water Orton**
CFA	CFA19 – Coleshill Junction.
Resource type	Residential.
Resource description/profile	Residential bungalows on Plank Lane, two storey semi-detached homes at the end of Long Leys Croft, and a two storey semi-detached home at the end of Mickle Meadow (eleven dwellings in total).
Assessment year	Construction phase (2017+).
Impact 1: amenity	Impact: as a result of the construction of the relocated Water Orton Primary School major significant adverse noise effects are identified for properties around the site of construction of the relocated school, including properties directly to the east. In addition, the construction of the relocated school will have major adverse significant visual effects from properties directly to the east; this will include new views opened up of the scheme as well as views of the school construction. Duration of impact: up to 15 months during the construction of the relocated school.
Assessment of magnitude	Medium as both noise and visual assessments have concluded a significant residual effect.

Resource name	151 to 161 Plank Lane, 1 to 7 Long Leys Croft, and 19 Mickle Meadow, Water Orton
Relevant receptors	Residential occupiers.
Assessment of sensitivity of receptors(s) to impact	High.
Significance rating of effect	Major adverse effect. This is a new effect not previously identified in the main ES or SES and AP2 ES.
Proposed mitigation options for significant effects	No further mitigation identified.
Residual effects significance rating	Major adverse effect. This is a new effect not previously identified in the main ES or SES and AP2 ES.

Cultural heritage

Introduction

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

Scope, assumptions and limitations

5.2.76 The assessment scope, key assumptions and limitations for cultural heritage are as set in 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

5.2.77 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 was updated with the results of additional survey work in the SES and AP2 ES.

5.2.78 Details of survey and desk-based work undertaken in this CFA since September 2013 is provided in the SES and AP2 ES, Volume 5, Appendix CH-004-019 and Volume 5 map series CH-07; CH-09 and CH-10, where this was relevant to the assessment of a new or different significant effect.

5.2.79 Heritage assets potentially affected by the amendment through physical change or changes to their setting are:

- ridge and furrow earthworks (asset reference COL042), an asset of low value;
- Water Orton medieval settlement (asset reference COL047), an asset of moderate value; and

- a group of non-designated buildings in Water Orton (asset reference COL088), an asset of low value.

Future baseline

Construction (2017)

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

5.2.81 None of the identified developments affects the assessment of the AP4 amendment's likely construction impacts on cultural heritage.

Operation (2026)

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

5.2.83 None of the identified developments affects the assessment of the AP4 amendment's likely operational impacts on cultural heritage.

Effects arising during construction

5.2.84 The main ES reported no change on an area of ridge and furrow earthworks (asset reference COL042). The area of ridge and furrow earthworks (asset reference COL042), an asset of low value, which is located within the proposed land required for the amendment, will be removed by the AP4 revised scheme (refer to the main ES, Volume 5, cultural heritage map book, map CH-01-124 for the location of the asset). This will constitute a high adverse impact on the asset, resulting in a moderate adverse effect, which is significant. The amendment will give rise to a new significant effect, and the resulting update to the main ES, Volume 5, Appendix CH-003-019 assessment table is included in Table 9.

5.2.85 The main ES reported no change to Water Orton Medieval Settlement (asset reference COL047). Water Orton Medieval Settlement (COL047) is an asset of moderate value which is located partially within the land required for construction of the relocated Water Orton Primary School. The loss of a small portion, less than 5%, of the asset will constitute a low adverse impact on the asset, giving rise to a minor adverse effect. The amendment will not give rise to a new or different significant effect.

5.2.86 The main ES reported no change to a group of non-designated buildings in Water Orton (asset reference COL088). The relocation of Water Orton Primary School will give rise to a new temporary impact on the asset. The construction of the proposed new school, with associated construction noise and traffic, will have a low impact on the setting of this low value asset, resulting in a negligible adverse effect. The amendment will not give rise to a new or different significant effect.

Effects arising from operation

5.2.87 The proposed 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.

Mitigation and residual effects

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

5.2.89 The proposed amendment will give rise to a new residual moderate adverse significant effect on an area of ridge and furrow (asset reference COL042).

Cumulative effects

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

Volume 5 amendments

5.2.91 Table 9 sets out the updates to the main ES, Volume 5, Appendix CH-003-019, as a result of the proposed amendment.

Table 9: Impact assessment for CFA19

Unique identification	Name	Designation(s)	Value	Construction impact			Operation impact			New or different likely significant environmental effect from that reported in the main ES
				Nature of impact including mitigation	Scale of impact	Effect	Nature of impact including mitigation	Scale of impact	Effect	
COL042	Ridge and Furrow	n/a	Low	The proposed relocation of Water Orton Primary School will give rise to a new significant permanent effect on an area of ridge and furrow earthworks. This asset of low value is located within the proposed land required for construction, and will be removed. This will constitute a high adverse impact, resulting in a moderate adverse effect.	Permanent high adverse	Moderate adverse	No impact on significance	No change	Neutral	This is a new effect. The removal of the asset will result in a permanent moderate adverse effect, an increase from a neutral effect reported in the main ES.

Ecology

Introduction

5.2.92 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 amendment, compared to those of the SES3 scheme.

Scope, assumptions and limitations

5.2.93 Updates to the scope of the assessment for ecology are set out in Volume 1 of the SES3 and AP4 ES. The key assumptions and limitations, and the methodology for determining significance of effects are as set out in Volume 1, the SMR and the SMR Addendum (Volume 5: Appendix CT-001-000/01 and CT-001-000/02 of the main ES) and in Addendum 4 to the SMR (SES3 and AP4 ES Volume 5: CT-001-000/5).

5.2.94 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 AP4 revised scheme.

Existing baseline

5.2.95 The ecological baseline of the land required for the amendment has been based on field data collated for the main ES and SES and AP2 ES, additional Phase 1 habitat survey work undertaken in July 2015, aerial photography and relevant existing information gathered from national organisations and from regional and local sources including: Warwickshire County Council (Warwickshire Biological Records Centre) and Warwickshire Wildlife Trust.

5.2.96 A summary of the baseline information relevant to the assessment of the amendment is provided below. This takes account of any relevant 2015 survey information provided in SES3 and AP4 ES, Volume 5: Appendix EC-001-003. For those receptors described in the main ES, further details are provided in Volume 2, CFA19, Section 7 and in Volume 5, including maps EC-01 to EC-12. For those receptors described in the SES and AP2 ES, further details are provided in Volume 2, CFA19, Section 2 and in Volume 5, including maps EC-01, EC-04 and EC-105.

Designated sites

5.2.97 There are no statutory or non-statutory designated nature conservation sites relevant to the assessment.

Habitats

5.2.98 The amendment area consists predominately of grazed poor semi-improved grassland within a single field, with scattered mature trees. These areas are considered to have no more than local/parish value.

5.2.99 A linear strip of dense scrub is present along the northern boundary of the amendment area, and patches of scrub were recorded in the east. Areas of scrub within the amendment area are considered to have local/parish value.

5.2.100 A copse of broadleaved woodland is present along the southern boundary and in the south-western corner of the amendment area, adjacent to Plank Lane. The area of broadleaved woodland within the land required for the amendment is considered to have local/parish value.

5.2.101 A species-poor hedgerow is present along the western boundary of the land required for the amendment. From a review of aerial photography, this hedgerow connects with other hedgerows in the local area. The main ES valued the hedgerow network within Coleshill Junction to be of district/borough value. As a precautionary measure, the hedgerow along the western boundary of the amendment area is therefore considered to form part of this network and be of up to district/borough value.

5.2.102 A wet ditch is present parallel to the species-poor hedgerow along the western boundary of the land required for the amendment. It is heavily poached (eroded by grazing livestock), supports no aquatic vegetation and is considered to be of no more than local/parish value.

5.2.103 An area of tall ruderal vegetation was recorded in the centre of the amendment area which is considered to be of negligible value.

Protected and/or notable species

5.2.104 A small great crested newt population was recorded in a pond located approximately 190m to the south of the land required for the amendment in the main ES. The population in this pond is part of AMP33 which comprises five waterbodies. The wet ditch within the land required for the amendment is located within 250m of a great crested newt breeding pond within AMP33. Taking a precautionary approach, it is assumed that the unsurveyed wet ditch supports a great crested newt breeding population of medium population size class. It is therefore assumed that the wet ditch extends AMP33 to comprise six water bodies. Great crested newt from AMP33 are therefore assumed to use the poor semi-improved grassland, broadleaved woodland and species-poor hedgerow within the amendment area, as terrestrial habitat. Surveys of the ponds in AMP 33 were incomplete, and it was assumed in the main ES that this metapopulation could support a medium size class population of great crested newts; AMP 33 was assessed as having county/metropolitan value. The addition of the medium great crested newt population assumed to be present within the wet ditch does not change the valuation of AMP33 from the main ES.

5.2.105 The poor semi-improved grassland, tall ruderal, scrub, broadleaved woodland, species-poor hedgerow and scattered trees within the amendment area, could be used by breeding and wintering and passage birds. Surveys undertaken of arable and grassland fields to the south of Water Orton, adjacent to the HS2 route, recorded breeding and wintering assemblages of birds which were reported to have local/parish value in the main ES. It is assumed that the breeding and wintering bird assemblages associated with fields to the south of Water Orton could also use habitats within the amendment area and are of up to local/parish value.

5.2.106 A breeding barn owl pair was reported approximately 820m to the south-east of the land required for the amendment in the main ES, which was considered to have county/metropolitan value. The poor semi-improved grassland within the amendment area is suitable as foraging habitat for barn owl, and is likely to be located within this breeding pair's territory.

5.2.107 There are no buildings or trees supporting known bat roosts within the land required for the amendment. There are trees which have moderate and some trees which have high bat roosting potential within the land required for the amendment. The scattered trees and broadleaved woodland within the land required for the amendment could also be used by foraging and commuting bats. The main ES reported an assemblage of bats (including common pipistrelle, soprano pipistrelle, noctule, *Myotis* species, and Leisler's bat) using roosting, foraging and commuting habitats at and near Water Orton, as having district/borough value. Connective habitat, in the form of hedgerows and tree lines, is present linking the hedgerows and trees located within the amendment area to those used by the bat assemblage. Taking a precautionary approach, it is assumed that the assemblage of bats using roosting, foraging and commuting habitats at and near Water Orton also use roosting, foraging and commuting habitats within the land required for the amendment.

5.2.108 The field margins, tall ruderal vegetation and woodland edge habitats within the amendment area could support common reptile species. The main ES assumed that populations of common reptile species are present within suitable habitat within the Coleshill Junction area, and were reported to have local/parish value.

Future baseline

Construction (2017)

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

5.2.110 None of the identified developments affects the assessment of the AP4 amendment's likely construction impacts on ecology.

Operation (2026)

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

5.2.112 None of the identified developments affects the assessment of the AP4 amendment's likely operational impacts on ecology.

Effects arising during construction

Avoidance and mitigation measures

5.2.113 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

5.2.114 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

5.2.115 The species-poor hedgerow along the western boundary of the land required for the amendment will be retained. As such, the amendment will not give rise to a new or different significant effect on the hedgerow network and will not change the level of significance of the effects reported in the main ES.

5.2.116 There will be approximately 0.1ha lost within the copse of broadleaved woodland adjacent to Plank Lane as well as scattered mature trees. This will result in an adverse effect at the local/parish level which is not significant.

5.2.117 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. Local/parish level effects which are in addition to those identified in the main ES and the SES and AP2 ES are listed in Volume 5: Appendix EC-003-003 of the SES3 and AP4 ES.

Protected and/or notable species

5.2.118 The original scheme would result in the loss of approximately one third of the available terrestrial habitat used by AMP33, which will result in a permanent adverse effect on the conservation status of the great crested newt population in AMP33 significant at the county/metropolitan level. No water bodies will be lost as a result of the amendment, as the wet ditch along the western boundary of the land required for the amendment will be retained. The amendment will result in an increase in the amount of terrestrial habitat loss within AMP33, from one third to just over one third of the available terrestrial habitat comprising semi-improved grassland and broadleaved woodland. The implementation of measures within the draft CoCP will ensure there will be no killing or injury of great crested newts (if present) as a result of the amendment. The amendment will result in a different significant effect on great crested newt AMP33. However, the effect will remain significant at the county/metropolitan level.

5.2.119 The main ES reported an adverse effect on a breeding pair of barn owls that is significant at a county/metropolitan level. The amendment will result in the loss of barn owl foraging habitat associated with a barn owl breeding territory near Water Orton, provided by the poor semi-improved grassland. As the barn owl breeding territory at Water Orton was reported to be lost in the main ES, the amendment will not give rise to a new or different significant effect on barn owl, and will not change the level of significance of the effects reported in the main ES.

5.2.120 The main ES reported temporary adverse effects on the conservation status of the assemblage of bats using roosting, foraging and commuting habitats at and near Water Orton, which will be significant at a district/borough level. This was associated with the loss of trees with moderate and high potential for roosting bats, and the permanent loss and severance of foraging and commuting habitat. It was noted in the main ES that the character of this area limits the potential for high densities of foraging and commuting bats to be present, due to isolation from the wider countryside by urban development and the surrounding motorways. The amendment will result in the loss of trees with moderate and high potential for roosting bats, and the loss of poor semi-improved grassland, scrub and 0.1ha of the broadleaved woodland which is assumed to be used by bats as foraging and commuting habitat. The amendment will result in a different significant effect on the assemblage of bats

associated with land at Water Orton due to an increase in the loss of roosting, foraging and commuting habitat. However, the amendment will not change the level of significance of the effects on the bat assemblage associated with habitats near Water Orton reported in the main ES.

5.2.121 It is unlikely that the amendment will result in any other new or different effects on species receptors of relevance at more than the local/parish level. Local/parish level effects which are in addition to those identified in the main ES and the SES and AP2 ES are listed in Volume 5: Appendix EC-003-003 of the SES3 and AP4 ES.

Cumulative effects

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

Mitigation and residual effects

Other mitigation measures

5.2.123 Mitigation measures for great crested newt reported in the main ES consist of providing compensatory habitats within an ecological mitigation area to the south of Water Orton. This will include the provision of replacement ponds, terrestrial habitat and hibernation habitat sufficient to maintain the favourable conservation status of pond habitats and of the amphibian populations affected, including AMP33. With the implementation of these mitigation measures, it is expected that the different effect on AMP33 due to the loss of terrestrial habitat within land required for the amendment will be reduced to a level which will not result in any significant effect on the conservation status of the great crested newt metapopulation.

5.2.124 Mitigation reported in the main ES to reduce disturbance impacts on roosting, foraging and commuting bats consists of additional measures in accordance with the principles of ecological mitigation identified within the SMR Addendum (Volume 5: Appendix CT-001-000/2 of the main ES). The main ES also reported that an ecological compensation area consisting of new planting to the south of Water Orton will be provided. With the implementation of these mitigation measures, it is expected that the different effects due to the loss of roosting, foraging and commuting habitats at and near Water Orton will be reduced to a level which will not result in any significant effect on the conservation status of the assemblage of bats concerned.

5.2.125 No additional mitigation measures in addition to those identified in the main ES or SES and AP2 ES (Part 1) are required.

Summary of likely residual effects

5.2.126 No new or different residual effects on ecological receptors occur as a consequence of the amendment. The significant residual effects of the AP4 revised scheme in this area are therefore unchanged from those reported in the main ES and SES and AP2 ES (Part 1) and SES3.

Effects arising from operation

5.2.127 There are no new or different significant operational effects for ecology as a result of the amendment in comparison with the main ES, SES and AP2 ES (Part 1). No

avoidance and mitigation measures additional to those reported in the main ES are required.

Land quality

Introduction

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

Scope, assumptions and limitations

5.2.129 The assessment scope, key assumptions and limitations for land quality 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

5.2.130 The existing baseline land quality information for the area is as described in the main ES (Volume 2, CFA19, Section 8).

5.2.131 The bedrock geology underlying the land required for the amendment is the Mercia Mudstone Group comprising mudstone with subordinate sandstone and siltstone. The Mercia Mudstone is classified by the Environment Agency as a Secondary B aquifer.

5.2.132 Superficial Deposits underlying the amendment area are River Terrace Deposits comprising sand and gravel. These are classified by the Environment Agency as a Secondary A aquifer.

5.2.133 The presence of made ground is not indicated on BGS mapping, but there is likely to be made ground associated with the existing roads in the vicinity of the amendment.

5.2.134 A sand and gravel MSA covers the area of the amendment, and the majority of the wider CFA19 assessment area.

Future baseline

Construction (2017)

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

5.2.136 None of the identified developments affect the assessment of the AP4 amendment's likely construction impacts on land quality.

Operation (2026)

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

5.2.138 None of the identified developments affect the assessment of the AP4 amendment's likely operational impacts on land quality.

Effects arising during construction

5.2.139 The amendment is located outside the study area of the main ES. A review has been carried out of the additional permanent land required for the school relocation, and a buffer extending out for 250m which represents the study area as defined in the SMR and its addendum, presented in Volume 5 of the main ES (Appendices CT-001-000/1 and 2). This review has identified no potentially contaminative land uses in the study area and no effects arising during construction in respect of land quality.

5.2.140 The amendment site is located in a sand and gravel MSA. This resource was assessed in the main ES and construction of the scheme was anticipated to have a negligible (non-significant) effect on the MSA. This will be unchanged by the amendment.

5.2.141 In summary, 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.

Effects arising from operation

5.2.142 The amendment will not give rise to new or different significant effects during operation and will not change the level of significance of the effects reported in the main ES.

Mitigation and residual effects

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

5.2.144 The amendment does not give rise to any new or different residual significant effects.

Cumulative effects

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

Landscape and visual assessment

Introduction

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

Scope, assumptions and limitations

5.2.147 The assessment scope, key assumptions and limitations for the landscape and visual assessment are as set out in Volume 1, the SMR (Volume 5: Appendix CT-001-000/1) and the SMR Addendum (Volume 5: Appendix CT-001-000/2) of the main ES. Updates to the methodology for the landscape and visual assessment are also described in Volume 1 of the AP1 ES and Volume 1 of the SES and AP2 ES.

Existing baseline

5.2.148 The area of land required for the amendment is located within the Cole Valley LCA as described in the main ES (Volume 2, CFA19, Section 9) and illustrated on map LV-02-084a.

5.2.149 Viewpoint 313.2.004: view south from residences on Birmingham Road and Plank Lane is also located in close proximity to the amendment and is described in the main ES (Volume 5, CFA19, Landscape Report, Appendix LV-001-019, Part 2).

5.2.150 In order to assess the likely changes to views arising from the amendment, a viewpoint is added to this assessment, viewpoint 313.2.005: view south-west from residences along Coleshill Road and Mickle Meadow, Water Orton. The foreground of the view comprises a gently rising terrain of fields which are open in character. Middle ground views are of mature vegetation. Background views are of residences on Attleboro Lane. The baseline for this new viewpoint is described in the SES3 and AP4 ES, Volume 5: Appendix LV-001-019, and the location is shown on maps LV-03-084a and LV-04-084a in the SES3 and AP4, Volume 5, CFA19 Map Book. The viewpoint is assessed as high sensitivity due to the presence of residential properties and use of the path by recreational users.

Future baseline

Construction (2017)

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

5.2.152 None of the identified developments affect the assessment of the AP4 amendment's likely construction impacts on landscape character and views.

Operation (2026)

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

5.2.154 None of the identified developments affect the assessment of the AP4 amendment's likely operational impacts on landscape character and views.

Effects arising during construction

Landscape assessment

5.2.155 Cole Valley LCA was affected by the SES3 scheme and will also be affected by this amendment (AP4-019-002). The Cole Valley LCA is predominantly rural and within designated green belt, with historic former parkland fragmented by subsequent development. The landscape condition was reported in the main ES as fair, due to the relatively well maintained appearance of woodlands, and vegetation along the River Cole, transport corridors and field boundaries. The main ES reported low tranquillity, due to the heavily trafficked major transport routes and the substantial levels of street lighting. As a result of green belt designation, the Cole Valley LCA was considered to

be valued at a regional level. Therefore this LCA is considered to be of medium sensitivity.

5.2.156 The main ES reported a moderate adverse effect during construction due to the formation of large scale embankments and structures, the partial loss of characteristic landscape features such as hedgerows, woodland, riverside vegetation and demolitions including Coleshill Manor office Phase 2 building. The main ES also reported the presence of construction traffic on existing roads, introducing additional built form, lighting and activity within the agricultural landscape; and the relocation of overhead power lines. The construction effects were reported as reducing tranquillity locally.

5.2.157 The amendment will result in additional construction works within the LCA to build the replacement school, which will be undertaken in advance of the peak construction phase. Hedgerows and trees along the boundary of the site and Plank Lane will be lost as a result of the creation of the site access, and mature trees within the central area of the site are assumed to require removal to facilitate the construction of the replacement school building. The small copse at the boundary wall with Plank Lane and other existing trees within the site will be retained as far as is practical.

5.2.158 Whilst the replacement school will lead to additional construction activity within the Cole Valley LCA and limited further loss of hedgerows and trees, this will not result in new or different significant effects and will not change the level of significance of the effects reported in the main ES.

Visual assessment

5.2.159 Viewpoint 313.2.004: view south from residences on the Birmingham Road and Plank Lane was assessed as being affected by the SES3 scheme and will also be affected by this amendment. The main ES reported a minor adverse effect during construction.

5.2.160 The amendment does not generate any new or different significant effects upon viewpoint 313.2.004, due to intervening vegetation which will prevent views into the replacement school site.

5.2.161 New viewpoint 313.2.005: view south-west from residences along Coleshill Road and Mickle Meadow, Water Orton will be affected by the amendment during the construction period as a result of additional construction works to build the replacement school, which will be undertaken in advance of the peak construction phase.

5.2.162 The amendment will alter the foreground view from viewpoint 313.2.005 from gently rising and open fields, with trees and hedgerow boundaries, to a view of the construction of the replacement school in the foreground. The removal of trees along the Plank Lane boundary will open up views of dwellings on Attleboro Lane and, during the peak construction phase, the construction of embankments in the distance, filtered by intervening vegetation. This will be a substantial change to the view, which is in close proximity to the receptors and in direct frame of the view, and will add new components which will be highly visible. The magnitude of change, as a result of the amendment, is therefore assessed as high.

5.2.163 The amendment will give rise to a new significant effect on new viewpoint 313.2.005 which is major adverse, as a result of the high sensitivity of the receptor and the

assessed high magnitude of change. This will be a new significant effect in comparison to those reported in the main ES.

Effects arising from operation

Landscape assessment

5.2.164 The Cole Valley LCA was assessed as being affected by the original scheme and will also be affected by this amendment. The main ES reported a moderate adverse effect on the Cole Valley LCA during year 1 of operation due to the introduction of large-scale infrastructure, realignments of the River Cole and existing infrastructure, and partial loss of characteristic landscape features. By year 15, planting will have established and matured sufficiently to aid integration of the new elements and further reflect the existing landscape character, reducing the effects to be non-significant.

5.2.165 At year 1 of operation, the proposed relocation of Water Orton Primary School will result in a small amount of new built form within the LCA which is in keeping with the LCA, but will be a different significant effect. By year 15, new landscape planting within the replacement school site will have established and matured. Overall, these different effects will not change the level of significance of the effects reported in the main ES.

Visual assessment

5.2.166 Viewpoint 313.2.004: view south from residences on the Birmingham Road and Plank Lane was assessed as being affected by the SES3 scheme and will also be affected by this amendment. The main ES reported a minor adverse effect at year 1 of operation, reducing to negligible at year 15.

5.2.167 The proposed relocation of Water Orton Primary School does not generate any new or different significant effects upon viewpoint 313.2.004, due to intervening vegetation which will prevent views into the replacement school site.

5.2.168 New viewpoint 313.2.005 will be affected by the amendment during the scheme operation.

5.2.169 This viewpoint is assessed as high sensitivity due to the presence of residential properties and use of the path by recreational users. The amendment will alter the foreground view from gently rising and open fields, with trees and hedgerow boundaries, to a view of the replacement school building in the foreground. This will be a substantial change to the view, which is in close proximity to the receptors and in direct frame of the view, and will add new components which will be highly visible. The removal of trees at the Plank Lane boundary will open up views of dwellings on Attleboro Lane and embankments of the scheme in the distance, filtered by intervening vegetation. The magnitude of change, as a result of the amendment, at year 1 of operation is therefore assessed as high.

5.2.170 The amendment will therefore give rise to a new significant effect upon viewpoint 313.2.005 at year 1 of operation which is major adverse, as a result of the high sensitivity of the receptor and the assessed high magnitude of change. This will be an additional significant effect to those reported in the main ES.

5.2.171 At years 15 and 60, new planting associated with the school and located along the new school boundary adjacent to Plank Lane, will have established and matured, obscuring views to residences on Attleboro Lane and of the scheme. The school building will remain in the foreground and the magnitude of change therefore is assessed as high.

5.2.172 Therefore the amendment will give rise to new moderate adverse significant effects upon viewpoint 313.2.005 at years 15 and 60 of operation. These will be additional significant effects to those reported in the main ES.

Mitigation and residual effects

5.2.173 No additional mitigation measures (i.e. in addition to those identified in the main ES and subsequent SES reports) are required. There are no new or different residual construction or operational significant effects for landscape character as a result of the amendment in comparison to the main ES, the SES and the AP2 ES.

5.2.174 There are new residual construction and operational significant effects upon new viewpoint 313.2.005: view south-west from residences along Coleshill Road and Mickle Meadow, Water Orton, which are assessed as moderate adverse at years 15 and 60.

Cumulative effects

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

Sound, noise and vibration

Introduction

5.2.176 This section of the report describes the environmental baseline in relation to sound, noise and vibration that is relevant to the assessment. It then identifies any new or different likely significant environmental effects as a result of the amendment compared to those of the SES3 scheme.

Scope, assumptions and limitations

5.2.177 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.

5.2.178 Local assumptions and limitations for sound, noise and vibration are set out in main ES Volume 2, CFA19, Section 11.

Existing baseline

5.2.179 The baseline sound, noise and vibration information for CFA19 is described in the main ES (Volume 2, CFA19, Section 11.2). Baseline sound levels representative of the assessment locations affected by this amendment have been used in the construction and operational sound, noise and vibration assessments.

5.2.180 Additionally, the assessment of construction noise and vibration for the relocated school involves new assessment locations in addition to those previously assessed in the main ES. The measurements undertaken around Water Orton for the main ES

were considered sufficient to determine baseline sound levels for each new assessment location within this area.

5.2.181 In the area of Water Orton surrounding the amendment, the sound environment is dominated by continuous distant road traffic from the M6, during both day and night-time periods. Local traffic on Plank Lane and B4118 (Birmingham Road) also contributes, as well as trains on the Birmingham-Nuneaton line north of Water Orton. Close to these roads, typical baseline sound levels range from 55 to 65dB during the daytime, reducing to 50 to 60dB at night-time.

5.2.182 Further information on the existing baseline for this area, including baseline sound levels and baseline monitoring results, is provided in the main ES Volume 5: Appendix SV-002-019. The new assessment locations are as illustrated on SES3 and AP4 ES, Volume 5, Map Series SV-03. The baseline sound levels for the new assessment locations are presented in Table 10.

Table 10: Existing baseline sound levels

Assessment Location		Measurement location	Existing baseline sound level (dB)							Data source coding[7]
			For operational sound assessment				For construction sound assessment			
ID	Area represented		Daytime $L_{pAeq,16hr}$	Night-time $L_{pAeq,8hr}$	Arithmetic average of night-time $L_{pAFmax,5min}$	Highest night-time $L_{pAFmax,5min}$	Daytime $L_{pAeq,12hr}$	Evening/Weekend L_{pAeq}	Night-time L_{pAeq}	
721037	Plank Lane, Water Orton, Birmingham	CN159S	52.2	47.9	55.0	56.0	53.1	51.5	47.6	2,BC,ii,c
721038	Long Leys Croft, Water Orton, Birmingham	CN159S	51.2	46.9	53.0	54.0	52.1	50.5	46.6	2,BC,ii,c
721039	Orton Close, Water Orton, Birmingham	CN159S	51.2	46.9	53.0	54.0	52.1	50.5	46.6	2,BC,ii,c

[7] Table 1 in the main ES Volume 5: Appendix SV-002-019 provides a data source coding key.

Future baseline

5.2.183 Without the original scheme, existing sound levels in this area are likely to increase gradually over time. This is primarily due to road traffic growth on the existing road network. Changes in car technology may offset some of the expected sound level increases due to traffic growth on low speed roads. On higher speed roads, tyre sound dominates overall levels and hence the expected growth in traffic is likely to continue to increase ambient sound levels.

Construction (2017)

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

5.2.185 None of the identified developments affect the assessment of the AP4 amendment's likely construction noise and vibration impacts.

5.2.186 The relocation of Water Orton Primary School as part of the amendment introduces a new receptor for the assessment of effects on sound, noise and vibration during the construction of HS2.

Operation (2026)

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

5.2.188 None of the identified developments affect the assessment of the amendment's likely operational noise and vibration impacts.

5.2.189 The relocation of Water Orton Primary School as part of the amendment introduces a new receptor for the assessment of effects on sound, noise and vibration during the operation of HS2.

Effects arising during construction

5.2.190 The site for the relocated Water Orton Primary School brings three additional assessment locations on Plank Lane (ID 721037), Long Leys Croft (ID 721038), and Orton Close (ID 721039) within the spatial scope of the assessment[8], as illustrated on SES3 and AP4 ES, Volume 5, Map Series SV-03. In the main ES, predictions of construction noise were made at assessment location, reference 140636, on Plank Lane, which is considered to be representative of the school in this new location.

5.2.191 The proposed changes brought about by the amendmentwill alter the intervening distance between construction activities and receptors, which has the potential to alter the reported effects on nearby receptors.

5.2.192 An assessment has been undertaken to determine whether construction noise and vibration associated with the amendment would result in any new or different significant effects in comparison to the main ES, using the significance criteria detailed in the main ES (Volume 5: Appendix SV-001-000).

[8] Refer to Section 14 of the SMR (Appendix CT-001-000/1) and the SMR Addendum (Appendix CT-001-000/2).

5.2.193 Table 11 sets out the changes/additions to the main ES, Volume 5: Appendix SV-003-019, construction assessment, sound, noise and vibration for both residential and non-residential receptors.

5.2.194 Explanation of the information within this table is provided in the main ES, Volume 5: Appendix SV-003-019.

Table 11: Assessment of construction noise at residential receptors and non-residential receptors

Assessment location		Impact criteria				Significance criteria									Significant effect
ID	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the facade [Assessment category A/B/C]			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	
		Day 07:00–19:00	Evening 19:00–23:00	Night 23:00–07:00											
721037	Plank Lane, Water Orton, Birmingham	64/71 [A]	-	-	Earthworks	NA	6	R[9]	T[10]	-	-	-	10	-	CSV19-C03
721038	Long Leys Croft and Mickle Meadow , Water Orton, Birmingham	61/67 [A]	-	-	Earthworks	NA	5	R	T	-	-	-	10	-	CSV19-C03
721039	Orton Close, Water Orton, Birmingham	56/63 [A]	-	-	Earthworks	NA	15	R	T	-	-	-	-	-	
140636	Water Orton Primary School: New location	53/55	-	-		NA	1	G4[11]	T	-	-	-	-	-	

5.2.195 The amendment will give rise to a new direct adverse effect on residential properties on Plank Lane, Long Leys Croft and Mickle Meadow (CSV19-C03) that is considered to be significant when assessed on a community basis taking account of the local context. This new significant effect arises due to ground engineering activities associated with the construction of the Water Orton Primary School. The reasonable worst-case forecast noise levels at these receptors is up to 71 dB for a total period of approximately 10 months starting in 2019. Once constructed, the new school location will not be subject to an adverse noise effect from the construction of HS2.

5.2.196 For all other receptors, the amendment does not affect the predicted construction noise levels, and the likely significant effects identified in the main ES remain.

[9] R – non-residential.
[10] T – typical construction.
[11] G4 – offices; schools; colleges; hospitals; hotels; and libraries.

Effects arising during operation

5.2.197 The site for the relocated Water Orton Primary School is within the operational sound assessment scoping area, but outside of the groundborne sound or vibration scoping area. In the main ES predictions of operational airborne sound were made at assessment location, reference 140636, on Plank Lane, which is considered to be representative of the school in this new location. The scoping areas are defined in the main ES, Volume 5, Appendix SV-001-000.

5.2.198 The operational sound assessment has considered use of the school with respect to three potential sources:

- sound at the new school location from operation of the railway;
- sound of road traffic accessing the site; and
- sound generated by the school itself.

5.2.199 The change in road traffic flow and composition as a result of this amendment, results in a change that is less than the level defined in the main ES, Volume 5, Technical Appendices, Scope and Methodology report addendum (CT-001-000/2), and therefore is not subject to a detailed assessment.

5.2.200 An assessment has been undertaken to determine whether operational noise levels from the HS2 scheme would result in a new or different likely significant effect at the new school location, using the significance criteria detailed in the main ES (Volume 5: Appendix SV-001-000).

5.2.201 The new school location is not subject to an operational sound, noise or vibration effect due to the operation of the scheme.

5.2.202 Where relevant, significant operational noise effects from any mechanical or electrical plant associated with the facility will be avoided through the plant design and the specification of noise emission requirements, as detailed within main ES Volume 5: Appendix SV-001-000 (Annex E – Operation of stationary systems).

5.2.203 The sound associated with the school on neighbouring residential properties will be subject to the requirements of the Building Regulations. In addition, where it is necessary to do so, planning conditions can be imposed to ensure that use of the Water Orton Primary School does not result in any likely significant operational sound, noise and vibration effects.

Volume 5 amendments

5.2.204 Table 12 sets out the changes to the main ES, Volume 5, Appendix SV-004-019, Operational airborne sound level, noise impacts and effects at the new school location.

Table 12: Operational airborne sound level, noise impacts and effects

Assessment Location		Impact criteria										Significance criteria								Significant effect
ID	Area represented	AP4 revised scheme only (Year 15 traffic)			Do nothing (Opening year baseline)			Do something (Opening year baseline + Year 15 traffic)[12]		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation of effect	
		D[13]	N[14]	M[15]	D	N	M	D	N	D	N									
140636	Water Orton Primary School: New location	38	30	57/58	53	50	54	53	50	0	0	B[16]	1	G4[17]	T[18]	-	-	-	-	

[12] Where the scheme modifies an existing source, i.e. road or railway realignments, the scheme only level in the table includes the sound from the modified source. In this situation the Do something (Opening year baseline + Year 15 traffic) level has been corrected so as to not double count the sound associated with the road or railway on its new and existing alignment.

[13] D - Day - $L_{pAeq,07:00-23:00}$.

[14] N - Night - $L_{pAeq,23:00-07:00}$.

[15] M - Max - L_{pAFmax}. In the AP4 revised scheme only column, two values are presented. The first is the value for the HS2 mitigated train and the second is the value for the TSI compliant train. For further information refer to main ES Volume 5: Appendix SV-001-000.

[16] B - For non-residential receptors further detail about the type of effect is set out in the text of Appendix SV-001-000.

[17] G4 - Offices; schools; colleges, hospitals; hotels; and libraries.

[18] T - Typical construction.

Mitigation and residual effects

Construction

5.2.205 The assessment of construction noise and vibration assumes the implementation of the principles and management processes set out in the draft CoCP (Volume 5: Appendix CT-003-000).

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

5.2.207 The amendment will give rise to a new construction noise effect on approximately 11 residential properties on Plank Lane, Long Leys Croft and Mickle Meadow, Water Orton (CSV19-C03). This new significant effect arises due to ground engineering activities associated with the construction of the Water Orton Primary School. The reasonable worst-case forecast noise levels at these receptors is up to 71 dB for a total period of approximately 10 months starting in 2019.

Operation

5.2.208 The proposed mitigation is identified within the main ES, CFA19, Volume 2, Section 11.

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

Cumulative effects

5.2.210 There are no new or different likely significant cumulative effects for sound, noise and vibration as a result of the AP4 amendments interacting with one another, AP1 amendments, the AP2 amendments, or any relevant committed development.

Traffic and transport

Introduction

5.2.211 This section of the report describes the environmental baseline in relation to traffic and transport that is relevant to the assessment. It then identifies any new or different likely significant environmental effects as a result of the amendment, compared to those of the SES3 scheme, taking into account any relevant AP2 amendments.

Scope, assumptions and limitations

5.2.212 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

5.2.213 Existing conditions have been determined through site visits, additional transport surveys, liaison with the school to source postcode data and review of accident data.

5.2.214 Supplementary baseline traffic surveys were undertaken in April 2015 to assist in confirming prevailing traffic flows, turning movements and parking stress.

5.2.215 Water Orton Primary School is located in Water Orton village. The village is close to the M6, M6 toll and M42 motorways.

5.2.216 The current school is located on Attleboro Lane which has a narrow carriageway. Attleboro Lane leads to Vicarage Lane to the east, which provides vehicular access to the school. There are extensive parking and stopping restrictions on these roads. The neighbouring properties are all residential.

5.2.217 Vicarage Lane leads to Coleshill Road to the east and north providing access to B4117 Gilson Road, to the west Vicarage Lane leads to Plank Lane.

5.2.218 Plank Lane, the location of the proposed replacement school, has some residential properties but is mostly bordered by open fields and hedges. There are no yellow line markings along Plank Lane except at its junction with Vicarage Lane.

5.2.219 West of the site Plank Lane is street-lit from the southern side of the carriageway, where there is a continuous footway. There is no footway or kerb line on the northern side of Plank Lane.

5.2.220 The nearest bus stops are located at Water Orton railway station and provide access to local areas including; Birmingham, Castle Bromwich, Coleshill, Chelmsley Wood, Marston Green, Sheldon, Solihull and Sutton Coldfield. Bus route 70 operates on a frequency of every 30 minutes in the morning and day time and route 75 operates every 60 minutes.

5.2.221 Water Orton railway station is located at the junction of the B4118 Marsh Lane and B4117 Birmingham Road within a 10 minute walking distance of the school. It is served by CrossCountry services.

5.2.222 There are a number of footpaths through the playing fields adjacent to the current school providing access to Plank Lane and Vicarage Lane.

5.2.223 No accidents were identified on the immediate roads around the school between 2011 and 2013.

5.2.224 During surveys that were undertaken in April 2015, parking was observed along the west side of Vicarage Lane and the south side of Plank Lane for pick up and drop off at the school. Vehicles generally started arriving from 08:30 and most vehicles were gone by 09:00. Vehicles with children stopped for between three and 10 minutes.

5.2.225 The school currently has 35 car parking spaces accessed from Vicarage Lane, which are fully utilised by 09:00.

5.2.226 The wider existing baseline is as reported in Volume 2, CFA19, Section 12 of the main ES.

5.2.227 A report on traffic and transport and surveys undertaken within the area is contained in the SES3 and AP4 ES, Volume 5, Appendix TR-001-000, Transport Assessment.

Future baseline

Construction

5.2.228 The future baseline for traffic and transport during construction remains as reported in Volume 2, CFA19, Section 12 of the main ES as updated by the recent transport surveys.

Operation (2026 and 2041)

5.2.229 The future baselines for traffic and transport during operation remains as reported in Volume 2, CFA19, Section 12 of the main ES as updated by the recent transport surveys.

Effects arising during construction

Temporary effects

5.2.230 Measures to reduce the impacts of road based construction traffic will include generic and site specific management measures that will be implemented during construction of the new school on or adjacent to public roads, bridleways, footpaths and other public rights of way (PRoW) affected by the new school as necessary.

5.2.231 During the peak construction period HGV movements to and from the proposed site will average 12 HGV combined two-way trips[19] per day for approximately 12 months. In addition, there will be 40 light vehicle combined two-way trips per day including workforce traffic and van deliveries. Changes in traffic flows related to construction traffic associated with the school are not expected to result in any significant delays for road users on the local road network. This level of additional traffic will not result in any new or different significant effects in terms of congestion or delay since the junctions at either end of Plank Lane have capacity to accommodate the small increase in traffic.

Permanent effects

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

Effects arising from operation

5.2.233 This section looks at the operational effects of the proposed school on the surrounding local road network. The operational impacts relate to:

- changes to traffic on the approach routes to the school; and
- parking for staff and visitors.

5.2.234 The proposed school's location is 150m north-west of the existing school with proposed access via Plank Lane, which offers easy pedestrian access. It is central to the school's priority catchment area and is within the built up area. Due to the close proximity of the new site to the current school and with no increase in the number of

[19] Two-way trips refer to the total number of vehicle movements in both directions (i.e. with 200 westbound vehicles and 100 eastbound, there would be 300 two-way trips).

pupils, it is expected that the relocation proposals will have minimal impact on the existing highway network.

5.2.235 The new school site will include 40–45 parking spaces including staff, disabled and visitor parking.

5.2.236 An on-site drop-off area will be provided for delivery and turning to relieve pressure on parking on local roads and to mitigate potential issues arising from the narrowness of Plank Lane, off which the school will be located.

5.2.237 The majority of children come from the village of Water Orton, with some children travelling from further afield. It is expected that just over half of people accessing the school will be pedestrians, with most others accessing by car. This will be unchanged between the current and proposed school sites. Consequently, the impact on local roads will be very limited given the close proximity between the two sites. The improved facilities for drop-off will reduce any impacts of congestion but this will not represent a significant beneficial effect. Pedestrian flows will also be very similar between the two sites.

5.2.238 PRoW M40 will be maintained and will provide a pedestrian route to the school. The PRoW will be diverted to follow the existing field boundary (east of the proposed school), which increases its length by approximately 20m and has no significant effect on users.

5.2.239 Operation of the relocated school is not expected to result in any new or different significant effects.

Mitigation and residual effects

5.2.240 It is expected that the local highway authority will give consideration to the introduction of Traffic Regulation Orders (for example to introduce yellow line restrictions) along Plank Lane, if required.

5.2.241 During both construction and operation, construction worker and school travel plans respectively will be used to reduce any adverse traffic impacts and encourage the use of sustainable modes. The reductions in impacts arising from the travel plan measures have not been included in the assessment, which will mean that any adverse impacts may be overstated.

5.2.242 The relocated school will not result in any new or different significant residual effects in either construction or operation in relation to traffic and transport.

Cumulative effects

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

5.2.244 There are no new or different likely significant cumulative effects for traffic and transport as a result of AP4 amendments interacting with one another or AP2 amendments.

Water resources and flood risk assessment

Introduction

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

Scope, assumptions and limitations

5.2.246 The assessment scope, key assumptions and limitations for water 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.

Existing baseline

5.2.247 The water resources and flood risk 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 is provided in CFA19, Volume 2, Section 13 of the main ES.

5.2.248 The flood risk information includes the Environment Agency fluvial flood maps and the uFMfSW. This mapping indicates that both the existing and proposed site for the school is within an area at low risk from fluvial and surface flooding with an annual probability of flooding less than 1 in 1000 (0.1%).

Future baseline

Construction (2017)

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

5.2.250 None of the identified developments affect the assessment of the AP4 amendment's likely construction impacts on water resources and flood risk assessment.

Operation (2026)

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

5.2.252 None of the identified developments affect the assessment of the AP4 amendment's likely operational impacts on water resources and flood risk assessment.

Effects arising during construction

5.2.253 The principal impacts of concern to water resources and flood risk in respect to the amendment is in relation to the change in impermeable area at the proposed new school site. An increase in impermeable area has the potential to increase surface water runoff and hence associated flooding.

5.2.254 Temporary construction works will be in line with the draft CoCP (Section 16.3 of the draft CoCP) and therefore will consider surface water flood risk.

5.2.255 The amendment will result in a permanent increase in the area of impermeable surfacing, reducing infiltration at the location of the proposed school. The drainage strategy for the proposed school will adhere to the principles of sustainable drainage system (SuDS), ensuring that drainage design emulates the existing environment by reducing the run-off to greenfield rates. The impact on surface water is therefore considered negligible.

5.2.256 Through the implementation of mitigation measures the risks associated with surface water runoff during the construction phase will be reduced.

5.2.257 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.

Effects arising from operation

5.2.258 The amendment will not give rise to a new or different significant operational effect and will not change the level of significance of the operational effects reported in the main ES.

Mitigation and residual effects

5.2.259 The mitigation required for the relocation of Water Orton Primary School will include a surface water drainage system, through the inclusion of SuDS principles to effectively manage surface water run off. The drainage will adequately manage surface water run off of during the 1 in 100 annual probability (1%) rainfall event with an allowance for climate change. This is required to ensure that the new school is at an acceptable level of surface water flood risk and will prevent an increase in flood risk elsewhere.

5.2.260 There are no likely residual significant effects of the amendment on water resources and flood risk.

Cumulative effects

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

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

5.2.262 The community assessment concludes that the construction of the relocated Water Orton Primary School would result in residual amenity effects on residents living directly to the east of the site on Plank Lane, Long Leys Croft and Mickle Meadow (11 properties), assessed as major adverse significant, for a period of up to 15 months.

5.2.263 For cultural heritage, the amendment will give rise to a new residual significant effect due to the removal of an area of ridge and furrow (asset reference COL042). This will change the level of significance reported in the main ES from neutral to a permanent moderate adverse significant effect.

5.2.264 For landscape and visual effects, there are new residual construction and operational significant effects upon new viewpoint 313.2.005: view south-west from residences along Coleshill Road and Mickle Meadow, Water Orton, due to the presence of the new school building, which are assessed as moderate adverse at years 15 and 60.

5.2.265 The amendment will give rise to a new construction noise effect on residential properties on Plank Lane, Long Leys Croft and Mickle Meadow (CSV19-C03) that is considered to be significant when assessed on a community basis taking account of the local context. This new significant effect arises due to ground engineering activities associated with the construction of the Water Orton Primary School. The reasonable worst-case forecast noise levels at these receptors is up to 71 dB for a total period of approximately 10 months starting in 2019.

5.3 Temporary Improvements to the junction of the A446 Lichfield Road and B4118 Marsh Lane to the east of Water Orton (AP4-019-003)

5.3.1 SES3 reports a major adverse significant effect due to delay and congestion during construction for the A446 Lichfield Road/B4118 Marsh Lane junction to the east of Water Orton. A need for additional measures to mitigate the adverse impacts has been identified.

5.3.2 Temporary improvements to the junction are proposed which require the widening of the northbound carriageway of the A446 Lichfield Road to two lanes on both the approach and exit to the junction for a length of approximately 190m. In addition, it is proposed that the right turn from B4118 Marsh Lane will be temporarily prohibited (SES3 and AP4 ES Volume 2: CFA19 Map Book, map CT-05-136a, G1-G2, H1-H2).

5.3.3 To facilitate the road widening, additional permanent earthworks are required on land to the west of the A446 Lichfield Road. The extended earthworks will be planted. An existing multi-cell flood culvert structure will be extended beneath the A446 Lichfield Road just to the north of B4118 Marsh Lane.

5.3.4 The improvements will remain in place for up to five years, after which the road will be reinstated to its existing arrangement, although the earthworks and extended culvert structure will remain in place.

5.3.5 It is recognised that there may be a local benefit in making these temporary improvements permanent. HS2 Ltd will discuss this further with the local highway authority (Warwickshire County Council) to agree if these measures should be removed after the works, or retained as a permanent improvement using the local highway authority's powers.

5.3.6 It is expected that construction of the improvements will commence in Q2 2018 and take approximately 16 weeks to complete.

5.3.7 Approximately 1.1ha of additional permanent land is required and an additional 0.7ha of land is required temporarily.

Topics to be included in the assessment

5.3.8 The temporary improvements to the junction of the A446 Lichfield Road and the B4118 Marsh Lane are not considered to result in 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 sound, noise and vibration. However, reassessment was considered to be required in respect of: cultural heritage, ecology, traffic and transport, and water resources and flood risk.

Cultural heritage

Introduction

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

Scope, assumptions and limitations

5.3.10 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.

Existing baseline

5.3.11 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 was updated with the results of additional survey work in SES and AP2 ES.

5.3.12 Details of survey and desk-based work undertaken in this CFA since September 2013 is provided in SES and AP2 ES Volume 5: Appendix CH-004-020 and Volume 5 map series CH-07; CH-09 and CH-10, where this is relevant to the assessment of a new or different significant effect.

5.3.13 Heritage assets potentially affected by the amendment through physical change or changes to their setting are:

- former land division and ridge and furrow earthworks, south of River Tame (asset reference COL048), an asset of low value; and
- Curdworth Bridge (asset reference COL102), an asset of low value.

Future baseline

Construction (2017)

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

5.3.15 None of the identified developments affects the assessment of the AP4 amendment's likely construction impacts on cultural heritage.

Operation (2026)

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

5.3.17 None of the identified developments affect the assessment of the AP4 amendment's likely operational impacts on cultural heritage.

Effects arising during construction

5.3.18 The main ES reported a permanent high adverse impact on former land division and ridge and furrow, south of River Tame (asset reference COL048), an asset of low value, from the construction of Watton House south embankment at Chattle Hill, giving rise to a moderate adverse effect, which is significant. The amendment will result in a slight additional encroachment on this asset by construction work, resulting in a small additional area, less than 5%, of the asset being removed. This is not considered to result in a different effect compared to that already reported in the main ES. The amendment will not give rise to a new or different significant effect and will not change the level of significance of effects reported in the main ES.

5.3.19 The main ES reported a temporary low adverse impact on Curdworth Bridge (asset reference COL102), an asset of low value, from the construction of the proposed scheme. This resulted in a minor adverse effect. The amendment will result in temporary construction works adjacent to the bridge, which will impact on its setting. However, the setting of Curdworth Bridge (asset reference COL102) is already compromised by the existing nearby highways infrastructure, and this amendment will not give rise to a new or different significant effect and will not change the level of significance of effects reported in the main ES.

Effects arising from operation

5.3.20 The proposed 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.

Mitigation and residual effects

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

5.3.22 The proposed amendment will not give rise to a new or different significant effect and will not change the level of significance of the effects reported in the main ES.

Cumulative effects

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

Ecology

Introduction

5.3.24 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 amendment, compared to those of the SES3 scheme.

Scope, assumptions and limitations

5.3.25 Updates to the scope of the assessment for ecology are set out in Volume 1 of the SES3 and AP4 ES. The key assumptions and limitations, and the methodology for determining significance of effects are as set out in Volume 1, the SMR and the SMR Addendum (Volume 5: Appendix CT-001-000/1 and CT-001-000/2 of the main ES) and in Addendum 4 to the SMR (SES3 and AP4 ES Volume 5: CT-001-000/5).

5.3.26 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 AP4 revised scheme.

Existing baseline

5.3.27 The ecological baseline of the land required for the amendment has been based on a review of aerial photography, field data collated for the main ES and SES and AP2 ES, and relevant existing information gathered from national organisations and from regional and local sources including: Warwickshire County Council (Warwickshire Biological Records Centre) and Warwickshire Wildlife Trust.

5.3.28 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 SES3 and AP4 Volume 5: Appendix-001-003. For those receptors described in the main ES, further details are provided in Volume 2, CFA19, Section 7 and in Volume 5, including maps EC-01 to EC-12. For those receptors described in the SES and AP2 ES, further details are provided in Volume 2, CFA19, Section 2 and in Volume 5, including maps EC-01, 07, 09 and 10.

Designated sites

5.3.29 There are no statutory designated nature conservation sites or areas of woodland listed on the ancient woodland inventory relevant to the assessment.

5.3.30 The land required for the amendment is not subject to any non-statutory nature conservation designations. However, there are four non-statutory designated sites relevant to the assessment of the amendment. These are:

- Coleshill Sewage Works Grassland LWS, located approximately 12m to the south east of the amendment. The LWS is designated for the series of floodplain grasslands and wetland it supports, adjacent to the River Tame. This LWS was valued in the main ES as of county/metropolitan value;
- Water Orton Triangle LWS located approximately 10m to the south of the amendment. The LWS supports a complex mosaic of habitats including semi-improved grassland, marsh, scrub and damp woodland. This LWS is of county/metropolitan value;
- Marsh Lane Grassland and Marsh LWS, located approximately 5m to the west

of the amendment. It is designated as it represents one of a series of grasslands and wetlands along the River Tame which forms a wildlife corridor leading from the Tame valley wetlands complex into the Birmingham urban area. This LWS is of county/metropolitan value; and

- Coleshill Sludge Lagoons LWS, located approximately 170m to the east of the amendment. This LWS is designated for its mosaic of habitats including swamp, bare ground, pioneer habitats, steep banks, dense and open scrub and damp areas. This LWS was valued in Part 1 of the SES and AP2 ES as being of county/metropolitan value.

Habitats

5.3.31 The additional land required for the amendment contains poor semi-improved grassland located to the west of the existing A446 Lichfield Road. Areas of unmanaged semi-improved grassland within Coleshill Sewage Works Grassland LWS located adjacent to the land required for the amendment were valued in the main ES as being of local/parish value. The semi-improved grassland present in the land required for the amendment is likely to be of similar species composition and is considered to be of no more than local/parish value.

5.3.32 In addition, an area of scattered young or semi-mature trees and scrub is located adjacent to the existing A446 Lichfield Road along the west road verge. A review of aerial photography indicates the scattered trees and scrub in this area are typical of road verge vegetation and are considered to be of no more than local/parish value.

5.3.33 The A446 Lichfield Road, B4118 Marsh Lane, M6 Toll and an area of land to the west of the M6 Toll comprise areas of hardstanding of negligible value.

5.3.34 The land required for the amendment is located approximately 5m south of the River Tame, separated by an area of semi-improved grassland. The River Tame was valued in the main ES to be of district/borough value.

Protected and/or notable species

5.3.35 There are no known great crested newt breeding ponds located within the land required for the amendment. Waterbodies located within 250m of the land required for the amendment are considered unsuitable for great crested newt, or have been surveyed as part of the work carried out for the main ES and SES and AP2 ES and found not to support great created newt.

5.3.36 There are no buildings or trees supporting known bat roosts within the land required for the amendment. A review of aerial photography indicates that a number of trees are present along the road verge of the A446 Lichfield Road within land required for the amendment. Given the young and semi-mature nature of the trees, they are unlikely to support roosting bats. The main ES reported an assemblage of bats using foraging and commuting habitats in areas of woodland within Coleshill Sewage Treatment Works and along the adjacent River Tame. The main ES valued this assemblage of bats to be of county/metropolitan value. Connective habitat, in the form of the River Tame and tree lines, links the trees located within the land required for the amendment to those used by the bat assemblage. The trees and scrub present within the land required for the amendment could provide foraging and commuting

habitat for bats that are part of the assemblage of bats using foraging and commuting habitats in areas of woodland within Coleshill Sewage Treatment Works and along the adjacent River Tame.

5.3.37 The main ES reported a water vole population present on the ephemeral flooded pools within Coleshill Sewage Works Grassland LWS and possibly on the adjacent River Tame to be of county/metropolitan value. The land required for the amendment lies adjacent to a drain where this water vole population was recorded. However, no habitat suitable to support water vole is located within the land required for the amendment.

5.3.38 The main ES reported a low population of grass snake at Coleshill Sewage Treatment Works adjacent to the land required for the amendment. Suitable habitat in the form of semi-improved grassland is present within the land required for the amendment and therefore common reptile species could potentially be present within these areas. The main ES considered that areas of suitable habitat for reptiles in this area which were not surveyed could support populations of common reptile species of up to local/parish value.

5.3.39 The trees and scrub along the road verge of the A446 Lichfield Road and B4118 Marsh Lane within the land required for the amendment have the potential to support breeding birds. Considering the habitat present and the wider landscape setting, it is likely that common and widespread bird species will be present in these areas and that these bird populations would be of no more than local/parish value.

Future baseline

Construction (2017)

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

5.3.41 None of the identified developments affect the assessment of the AP4 amendment's construction impacts on ecology.

Operation (2026)

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

5.3.43 None of the identified developments affects the assessment of the AP4 amendment's likely operational impacts on ecology.

Effects arising during construction

Avoidance and mitigation measures

5.3.44 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

5.3.45 The amendment will not lead to the loss of land within any designated site. As such the temporary improvements to the junction of the A446 Lichfield Road and B4118 Marsh Lane 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

5.3.46 The proposed temporary improvements to the junction of the A446 Lichfield Road and B4118 Marsh Lane will result in the loss of an additional 0.5ha of scattered trees and 0.5ha of semi-improved grassland. The River Tame will not be affected by the amendment. This amendment will not generate any new or different significant effects, or change the level of significance of the effects reported in the main ES.

5.3.47 It is unlikely that the amendment will result in any new or different effects on habitat receptors of relevance at more than the local/parish level. Local/parish level effects which are in addition to those identified in the main ES and the SES and AP2 ES are listed in Volume 5: Appendix EC-003-003 of the SES3 and AP4 ES.

Protected and/or notable species

5.3.48 The main ES reported that the combined impacts of the loss of potential bat roosts, and some loss of foraging areas due to the construction of the original scheme, were unlikely to lead to a significant adverse effect of the conservation status of the assemblage of bats using foraging and commuting habitats in areas of woodland within Coleshill Sewage Treatment Works and along the adjacent River Tame. Bats from this assemblage may utilise areas of habitat, such as trees for roosting, and tree lines and scrub for foraging and commuting that are potentially affected by the amendment. These affected habitats are likely to represent a negligible area of the wider foraging and commuting resource that is available to this assemblage of bats and there are no roosts likely to be lost. The adoption of measures within the CoCP will provide controls to reduce the risk of displacement of bats. The amendment will not result in a new or different significant effect on the assemblage of bats using the foraging and commuting habitats in areas of woodland within Coleshill Sewage Treatment Works and along the adjacent River Tame, and this change will not change the level of significance of the effects reported in the main ES or SES and AP2 ES.

5.3.49 The main ES reported that construction impacts on the water vole population present within Coleshill Sewage Works Grassland LWS and possibly on the adjacent River Tame from potential habitat loss, habitat severance and temporary disturbance, would cause a permanent adverse effect on the conservation status of water vole that will be significant at the county/metropolitan level. The amendment is located adjacent to a drain which supports water vole from this population and approximately 5m from the River Tame; however it will not lead to any loss of habitat suitable to support water vole. The amendment will not give rise to a new or different significant effect on water vole and will not change the level of significance of the effects reported in the main ES.

5.3.50 It is unlikely that the amendment will result in any new or different effects on species receptors of relevance at more than the local/parish level. Local/parish level effects

which are in addition to those identified in the main ES and the SES and AP2 ES are listed in Volume 5: Appendix EC-003-003 of the SES3 and AP4 ES.

Cumulative effects

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

Mitigation and residual effects

Other mitigation measures

5.3.52 No additional mitigation measures (i.e. in addition to those identified in the main ES and SES and AP2 ES) are required.

Summary of likely residual effects

5.3.53 The proposed amendment will not give rise to new or different likely residual significant effect on ecological receptors and will not change the level of significance of the effects reported in the main ES or SES and AP2 ES.

Effects arising from operation

5.3.54 There are no new or different significant operational effects for ecology as a result of the amendment in comparison with the main ES or SES and AP2 ES. No avoidance and mitigation measures additional to those reported in the main ES are required.

Traffic and transport

Introduction

5.3.55 This section of the report describes the environmental baseline in relation to traffic and transport that is relevant to the assessment. It then identifies any new or different likely significant environmental effects as a result of the amendment, compared to those of the SES3 scheme taking into account any relevant AP2 amendments.

Scope, assumptions and limitations

5.3.56 The assessment scope, key assumptions and limitations and the methodology for determining significance of effects for traffic and transport are 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

5.3.57 The existing baseline is as described in the main ES (Volume 2 CFA19, Section 12) and in Volume 5 Part 2 (TR-001-000) of the main ES as updated in the SES and AP2 ES Volume 2, CFA19.

5.3.58 The baseline analysis determined that the existing traffic flows along the A446 in the vicinity of the B4118 Marsh Lane amount to 24,350 two-way vehicles per day. Flows on Marsh Lane amount to 4,900 two-way vehicles per day.

Future baseline

Construction

5.3.59 The future construction baseline for traffic and transport is as described in Volume 2, CFA19, Section 12 of the main ES as updated in the SES and AP2 ES, Volume 2, CFA19.

Operation (2026 and 2041)

5.3.60 The future operation baselines for traffic and transport are as set out in Volume 2, CFA19, Section 12 of the main ES as updated in the SES and AP2 ES, Volume 2, CFA19.

Effects arising during construction

5.3.61 SES3 (Part 1 of this report) reported that changes in traffic flows during construction will lead to a significant increase in delay and congestion for vehicle users leading to a major adverse significant effect at the junction of the A446 Lichfield Road and B4118 Marsh Lane.

5.3.62 This amendment relates to mitigation works to provide widening to the northbound A446 Lichfield Road carriageway at the junction of the A446 Lichfield Road and B4118 Marsh Lane. In addition it is proposed that the right turn from B4118 Marsh Lane will be temporarily prohibited.

5.3.63 With the amendment the junction operation improves, it will operate within its capacity and there would be reduced delay and congestion due to HS2 construction traffic. This will result in a different significant effect in relation to congestion and delays, reducing a major adverse significant effect to a moderate adverse significant effect (refer to map TR-03-104 in the SES3 and AP4 ES, Volume 5, Traffic and Transport Map Book).

Effects arising from operation

5.3.64 The amendment is for temporary works only and, unless otherwise agreed with the highway authority, would be removed after completion of HS2 construction works. Hence, there are no new or different operational effects for traffic and transport as a result of the amendment compared to those reported in SES3.

Mitigation and residual effects

5.3.65 No further changes to the mitigation described in the main ES (Volume 2 CFA19, Section 12) are required.

5.3.66 There will be a moderate significant residual adverse effect in relation to congestion and delay at the A446 Lichfield Road/B4118 Marsh Lane junction during construction, which is a reduction from the major significant adverse effect reported in SES3 (Part 1 of this report).

Cumulative effects

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

5.3.68 There are no new or different likely significant cumulative effects for traffic and transport as a result of AP4 amendments interacting with one another or AP2 amendments.

Water resources and flood risk assessment

Introduction

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

Scope, assumptions and limitations

5.3.70 The assessment scope, key assumptions and limitations for water 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.

Existing baseline

5.3.71 The water resources and flood risk 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 is provided in CFA19, Volume 2, Section 13 of the main ES and the SES and AP2 ES.

5.3.72 The flood risk information includes the Environment Agency fluvial flood maps and the uFMfSW. This mapping indicates that surrounding the junction there are areas identified to be within Flood Zone 2 and 3 and hence at risk of flooding more frequently than an annual probability of 1 in 100 (1%). The uFMfSW identify that the site is at a low risk of surface water flooding with an annual probability of less than 1 in 1000 (0.1%).

Future baseline

Construction (2017)

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

5.3.74 None of the identified developments affect the assessment of the AP4 amendment's likely construction impacts on water resources and flood risk assessment.

Operation (2026)

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

5.3.76 None of the identified developments affect the assessment of the AP4 amendment's likely operational impacts on water resources and flood risk assessment.

Effects arising during construction

5.3.77 The change potentially affecting water resources and flood risk in respect to the proposed widening of the A446 at the A446 Lichfield Road and B4118 Marsh Lane junction is the loss of floodplain within the 1 in 100 annual probability (1%) flood extent (Flood Zone 3). The Environment Agency Flood Zone maps show a thin area of floodplain connecting the river to the existing flood culverts.

5.3.78 The proposed works include the extension to the multi-cell flood culvert structure beneath the A446 Lichfield Road just to the north of B4118 Marsh Lane that will ensure that flood flow paths are retained. The land immediately west of the road widening will be modified to ensure that the existing connectivity between the river and the flood culverts is reinstated. The extension of this culvert will ensure that flood risk is not increased either at the location of the works or elsewhere. The impact of the change will be negligible on flood risk; therefore there will be no increase in the effect of the scheme.

5.3.79 The proposed amendment to the A446 Lichfield Road/B4118 Marsh Lane junction 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

5.3.80 The proposed amendment to the A446 Lichfield Road/B4118 Marsh Lane junction will not give rise to new or different significant effects and will not change the level of significance of the effects reported in the main ES and the SES and AP2 ES.

Mitigation and residual effects

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

5.3.82 There are no likely residual significant effects of the amendment on water resources and flood risk.

Cumulative effects

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

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

5.3.84 The traffic and transport assessment concludes that as a result of the amendment the junction operation improves. The junction will operate within its capacity and there would be reduced delay and congestion due to HS2 construction traffic. This will result in a different significant effect, reducing a major adverse significant effect in relation to congestion and delays to a moderate adverse significant effect.

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

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

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