HIGH SPEED RAIL (LONDON - WEST MIDLANDS)

Supplementary Environmental Statement 3 and Additional Provision 4 Environmental Statement

Volume 4 | Off-route effects

October 2015

SES3 and AP4 ES 3.4.1

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Department for Transport

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

1.1.1 The SES3 and the AP4 ES are separate documents. However, they are bound together and presented in a number of volumes. Each volume generally contains an introduction section and separate SES3 and AP4 ES sections, presented as Part 1 and Part 2 respectively. The introductory sections in each volume apply to both the SES3 (Part 1) and the AP4 ES (Part 2) sections. The SES3 and the AP4 ES comprise:

- 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 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: 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 included within the SES3 (Part 1) and an amendment 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 amendment). 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 two parts.

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

- new baseline information with respect to ecological surveys conducted during 2015;
- new information relating to hydraulic modelling and the flood risk assessment (FRA); and
- changes to the design or construction assumptions which do not require changes to the Bill.

Part 1 includes, where relevant:

- a description of the changes or updates 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 this report provides environmental assessment information relating to proposed amendment to the design, which has resulted in the need to alter the powers conferred by the Bill. The following is included where relevant:

- a summary of the proposed amendment that has triggered the need for reassessment;
- a description of the amendment;
- an assessment of the environmental effects of the 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 the 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 information relating to hydraulic modelling and the FRA; and
- changes to the design or to construction assumptions which do not require changes to the Bill.

1.1.6 The change to a construction assumption assessed within the SES3 comprises a revision to construction traffic assumptions associated with the Heathrow Express (HEx) depot, Langley.

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 SES or SES2 changes off-route, so the SES3 changes are compared to the AP2 revised scheme. AP2-000-001 involved the permanent relocation of the existing HEx depot at Old Oak Common to a proposed site in Langley, Slough. In summary the HEx depot will require approximately 40ha of land during construction of which 18.8ha is required permanently. Key features of the proposed HEx depot incorporate a maintenance shed, sidings, rail connections to the Great Western Main Line, facilities to maintain HEx trains, utility connections, access roads and a car park. In addition a section of Hollow Hill Lane will be realigned and lowered, a floodplain storage area created, agricultural land restored, landscape planting undertaken along with habitat creation.

1.1.10 The AP4 ES (Part 2 of this report) describes the likely significant effects of amendments to the design of the scheme, which require the use of land outside the original limits of the Bill, additional access rights, or other extensions to the powers conferred by the Bill, making it necessary to submit an AP to the Bill. The amendment assessed within the AP4 ES relates to additional land required for ecological mitigation at Langley. Figure 1 identifies the general location of the HEx depot, Langley referred to in this report.

1.1.11 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 AP2 amendments as relevant.

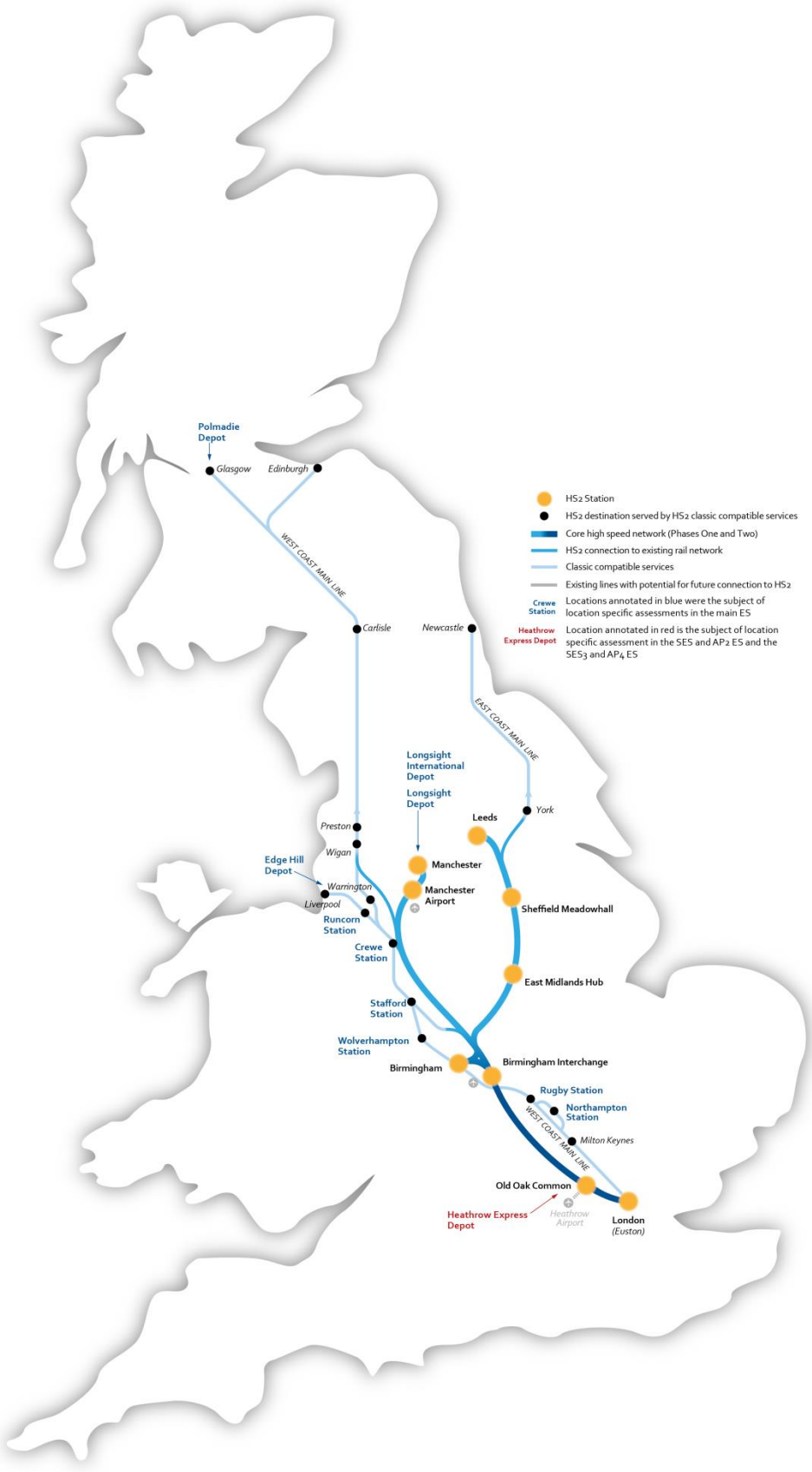
1.1.12 The standard measures that will be used to mitigate likely significant adverse environmental effects during construction and operation of the scheme are described in the main ES, Volume 1, Section 9 and the draft Code of Construction Practice (CoCP) submitted in support of the Bill. Implementation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

1.1.13 There are two further APs which require additional land at a distance beyond the HS2 route corridor. These are:

- the relocation of the Island Project School from Diddington Hall , Hampton-in-Arden, to a new site 11.3km south-west, at Jerrings Hall Farm, Solihull, (AP4-023-002). The original scheme resulted in a number of adverse effects on the Island Project School which would affect the children attending the school. In consultation with Island Project School, an alternative location for the school has been identified; and
- additional land required for relocation of an incinerator bottom ash plant from Castle Bromwich Business Park to a new site 9.5km to the south-west at Tyseley, (AP4-025-002) Nine buildings within the Castle Bromwich Business Park would be demolished to accommodate the construction of the original scheme, including the existing bottom ash processing plant.

1.1.14 The likely significant effects of these AP4 amendments are reported within the Volume 2: CFA23 report for relocation of Island Project School (AP4-023-002) and Volume 2: CFA25 report for the relocation of the bottom ash plant (AP4-025-002). Therefore no further reference is made to these APs in this document.

Figure 1: Locations of off-route stations and depots included in the main ES, SES and AP2 ES and SES3 and AP4 ES



Part 1: Supplementary Environmental Statement 3

2 Summary of changes

2.1 New environmental baseline information

Ecology

HEx depot, Langley

2.1.1 Details of amphibian surveys undertaken in the vicinity of the land required for the proposed HEx depot at Langley (AP2-000-001) during Q2 2015 are provided in SES3 and AP4 ES, Volume 5: Appendix HEX-EC-001.

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

Modifications to West Coast Main Line between Handsacre and Colwich

2.1.3 Details of amphibian surveys undertaken in the vicinity of the land required for modifications to the West Coast Main Line between Lichfield and Colwich during 2015 are provided in SES3 and AP4 ES Volume 5: Appendix EC-001-005.

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

Water resources and FRA

HEx depot, Langley

2.1.5 The SES and AP2 ES, Volume 4; Section 2.22 identified that replacement floodplain storage is to be provided as mitigation for the loss of 4.6ha of the existing Horton Brook floodplain, as a result of the proposed depot. The replacement floodplain storage area will be adjacent to the western side of Hollow Hill Lane, to the south of the Grand Union Canal and to the north of the depot track work as shown on map CT-06-154 in SES and AP2 ES Volume 4: Off-route Effects Map Book.

2.1.6 Since submission of the SES and AP2 ES, hydraulic modelling and further FRA has been completed (see SES3 and AP4 ES Volume 5: Appendix HEX-WR-001 and HEX-WR-002).

2.1.7 The FRA confirms that mitigation is required to minimise the impact on local receptors as reported in Section 2 of Volume 4 of the SES and AP2 ES. Proposed mitigation measures include replacement floodplain storage and a flood embankment parallel with and to the west of Hollow Hill Lane. These mitigation measures will be contained within land required temporarily and permanently to construct the AP2 revised scheme as shown on map CT-06-154 in SES and AP2 ES Volume 4: Off-route Effects Map Book. The FRA concludes that the SES3 scheme results in no significant effects in terms of the fluvial risk of flooding on receptors outside of the land required.

The FRA does not result in any new or different significant effects in respect of any of the environmental topics and therefore no further assessment is included.

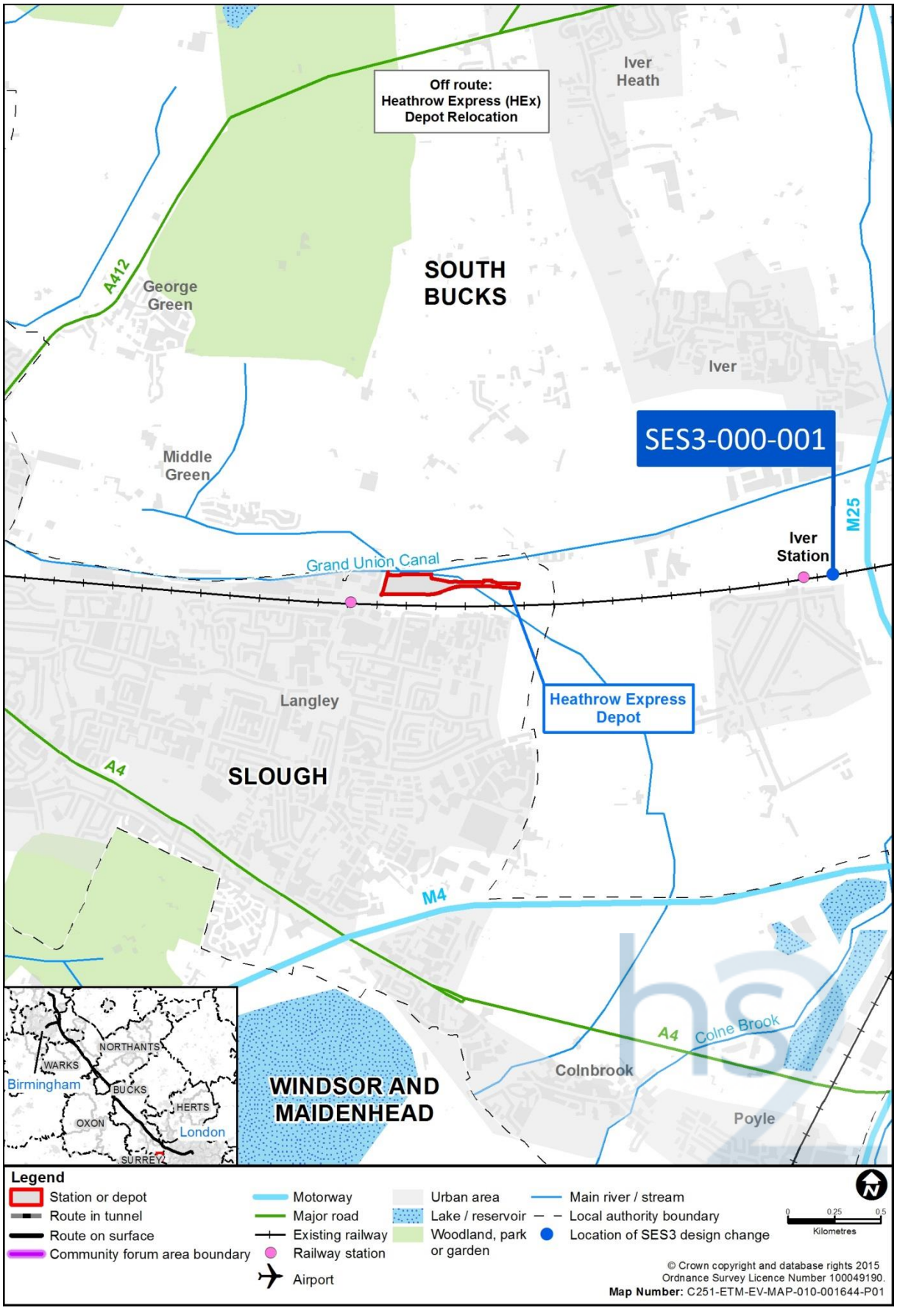
2.2 Changes to the design or to construction assumptions not requiring a change to the Bill

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 HEx depot, Langley area (Off-route). Figure 2 shows the location of the changes.

Table 2: Summary of changes to the design or to construction assumptions not requiring a change to the Bill in the Heathrow Express depot, Langley area (off-route)

Name of design change or construction assumption	Description of the AP2 revised scheme	Description of the SES3 scheme
Revision to the HEx Depot, Langley construction traffic assumptions (SES3-000-001)	Construction traffic would have travelled to and from the depot construction site primarily using Thorney Lane and the site access at the eastern end of the construction site. This included the majority of construction traffic utilising a route north via Bangors Road South, Bangors Road North and the A412 Denham Road. However, some traffic would have travelled to and from the proposed depot site using Langley Park Road and Station Road using the site access at the western end of the construction site.	The primary access to the depot construction site will now be from the western end of the site, and the majority of the traffic will travel to and from the site using Langley Park Road and Station Road. Use of the access to and from the site via Thorney Lane and the access at the eastern end of the site will be substantially reduced.

Figure 2: Locations of design changes not requiring a change to the Bill off-route



2.3 Description of changes to the design or construction assumptions

Revision to construction traffic assumptions (SES3-000-001)

2.3.1 The AP2 revised scheme provides for construction traffic routes to access the HEx depot construction site, with construction traffic primarily using Thorney Lane and the site access at the eastern end of the construction site. This included the majority (approximately 70%) of construction traffic utilising a route north via Bangors Road South, Bangors Road North and the A412 Denham Road. However, some traffic also would have travelled to and from the proposed depot site using Langley Park Road and Station Road using the site access at the western end of the construction site.

2.3.2 Since submission of the SES and AP2 ES, it has been determined that use of the construction traffic routes will be revised. This reflects potential constraints on routes from the east of the construction site and a review of the construction programme relating to import and export of excavated materials. This includes consideration of material generation rates to the east and west of Hollow Hill Lane. The primary access to the depot construction site will now be at the western end, and the majority of the traffic will travel to and from the site using Langley Park Road and Station Road. A reduced number of vehicles (at peak times less than 20 two-way heavy goods vehicle (HGV) trips per hour, split equally between northbound and southbound) will travel to and from the site using the access at the eastern end of the site (refer to map TR-03-HEx in SES3 and AP4 ES Volume 5, Technical appendices Map Book).

2.3.3 The revisions to the construction traffic assumptions result in new or different significant effects for: air quality; sound, noise and vibration; and traffic and transport. These are reported in Section 3.

2.4 Topics included in the SES3 assessment

2.4.1 The changes described above in Sections 2.2 and 2.3 result in new or different significant effects in respect of: air quality, community, sound, noise and vibration, and traffic and transport.

3 Assessment of changes

3.1 Air quality

Introduction

3.1.1 This section of the report describes the environmental baseline in relation to air quality that is relevant to the SES3 assessment. It then identifies any new or different likely significant environmental effects as a result of the changes introduced in Section 2, compared to those of the AP2 revised scheme.

Scope, assumptions and limitations

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

3.1.3 The study area includes the area within the vicinity of the proposed HEx depot, as well as the road network potentially affected by traffic changes.

3.1.4 The assessment of the amendment 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.

SES3 changes of relevance to this assessment

3.1.5 The change that is relevant to this assessment is the revision to the HEx depot, Langley, construction traffic assumptions (SES3-000-001).

Environmental baseline

Existing baseline

3.1.6 The existing baseline air quality information for the proposed HEx depot at Langley is described in the SES and AP2 ES, Volume 4: Off-route effects, Section 2.13 and SES and AP2 ES Volume 5: Appendix HEX-AQ-001.

3.1.7 As set out in Volume 1, the Environmental Protection UK[1] and the have issued new guidance on assessing air quality impacts. The main difference from the previous guidance is that it describes a similar increase in pollutant concentrations as having greater impact and therefore having a greater potential for significant effects. For example, where the baseline NO_2 concentration is under the standard at 38µg/m3 and increases by 1.5µg/m3 to 39.5µg/m3 with the scheme, the previous guidance would say that this is a slight adverse impact, while the new guidance that is a moderate adverse impact. It is accepted practice to complete an environmental impact assessment with the guidance published at the beginning of the process. However, HS2 Ltd and its consultants have adapted the assessment framework from the new guidance. This results in more importance being placed on changes in air quality in the assessment.

[1] Environmental Protection UK is a national charity that provides expert policy analysis and advice on air quality, land quality, waste and noise and their effects on people and communities in terms of a wide range of issues including public health, planning, transport, energy and climate.

Future baseline

Construction (2017)

3.1.8 The future baseline for construction in 2017 remains unchanged from that reported in SES and AP2 ES, Volume 4: Off-route effects, section 2.13.

Operation (2020)

3.1.9 The future baseline for operation in 2020 remains unchanged from that reported in the SES and AP2 ES, Volume 4: Off-route effects, section 2.13.

Effects arising during construction

Avoidance and mitigation measures

3.1.10 No avoidance and mitigation measures additional to those reported in the SES and AP2 ES, Volume 4: Off-route effects are proposed.

Assessment of impacts and effects

Temporary effects

3.1.11 Construction activity could affect local air quality through the additional traffic generated on local roads as a result of construction traffic routes.

3.1.12 Examination of the changes in traffic flows for 2017 along the affected roads has identified some roads that meet the criteria for further/more detailed assessment. Details of the assessed receptors along these roads are provided in Table 3.

Table 3: Modelled receptors (construction phase)

Receptor	Description/location	Ordnance Survey (OS) coordinates
16	Kingcup Farm	503670, 185112
17	Moat Place	504530, 185584
18	Sawyers Green Farm	501389, 180075
19	Ad Astra, Langley Park Road	502058, 180790
20	1 Lossie Drive	502024, 180818
21	Pine Lodge, Holly Bush Lane	502228, 180948
22	5 Honeysuckle Close	502190, 181032
23	26 Iverdale Close	502352, 180923
24	Jasmine Cottage, Wood Lane	502263, 181417
25	Flat 1, Heath Lodge, Wood Lane	502375, 181555

Receptor	Description/location	Ordnance Survey (OS) coordinates
26	Russett Cottage, Wood Lane	502148, 181981
27	Wood Lane House, Wood Lane	502199, 182176
28	10 Wood Lane, Iver Heath	502064, 182556
29	55 Wood Lane Close	502005, 182690
30	2 Warren Lodge, Church Road	502254, 183140
31	Flat 1, Aysgarth Place, Church Road	502658, 183646
32	Southlands, Denham Road	503420, 184416

3.1.13 The revised assessment found slight adverse or negligible impacts for NO_2 as shown in Table 4 and negligible impacts for PM_{10} as shown in Table 5 and Table 6. The proposed change to the construction traffic flows will not give rise to any new significant effects and therefore will not change the results of the assessment reported in the SES and AP2 ES.

Table 4: Summary of annual mean NO_2 results (construction)

Receptor	NO_2 concentrations (µg/m³)			Change in concentrations (µg/m³)	Impact descriptor	Impact descriptor using the previous 2010 guidance	Impact descriptor reported in the SES and AP2 ES
	2012 baseline	Without scheme	With scheme				
16	31.4	27.2	27.2	0.0	Negligible	Negligible	Negligible
17	31.6	27.2	27.2	0.0	Negligible	Negligible	Negligible
18	29.6	25.9	26.2	0.4	Negligible	Negligible	N/A
19	32.3	28.1	28.7	0.6	Negligible	Negligible	N/A
20	32.0	27.8	28.4	0.6	Negligible	Negligible	N/A
21	32.7	28.4	29.0	0.6	Negligible	Negligible	N/A
22	26.1	23.0	23.1	0.1	Negligible	Negligible	N/A
23	28.7	25.2	25.4	0.2	Negligible	Negligible	N/A
24	35.3	30.4	31.1	0.7	Slight adverse	Negligible	N/A
25	26.1	23.0	23.1	0.0	Negligible	Negligible	N/A

Receptor	NO_2 concentrations (µg/m³)			Change in concentrations (µg/m³)	Impact descriptor	Impact descriptor using the previous 2010 guidance	Impact descriptor reported in the SES and AP2 ES
	2012 baseline	Without scheme	With scheme				
26	28.8	25.1	25.4	0.3	Negligible	Negligible	N/A
27	31.7	27.4	27.9	0.5	Negligible	Negligible	N/A
28	30.3	26.2	26.6	0.4	Negligible	Negligible	N/A
29	27.0	23.6	23.7	0.1	Negligible	Negligible	N/A
30	36.5	31.2	31.7	0.6	Negligible	Negligible	N/A
31	42.3	35.9	36.7	0.9	Slight adverse	Slight adverse	N/A
32	32.3	27.9	28.0	0.0	Negligible	Negligible	N/A

Table 5: Summary of annual mean PM_{10} results (construction)

Receptor	PM_{10} concentrations (µg/m³)			Change in concentrations (µg/m³)	Impact descriptor	Impact descriptor using the previous 2010 guidance	Impact descriptor reported in the SES and AP2 ES
	2012 baseline	Without scheme	With scheme				
16	22.0	20.6	20.6	0.0	Negligible	Negligible	Negligible
17	22.4	20.9	20.9	0.0	Negligible	Negligible	Negligible
18	19.9	18.7	18.8	0.0	Negligible	Negligible	N/A
19	21.2	19.7	19.8	0.1	Negligible	Negligible	N/A
20	21.1	19.7	19.8	0.1	Negligible	Negligible	N/A
21	21.2	19.8	19.9	0.1	Negligible	Negligible	N/A
22	19.2	18.1	18.1	0.0	Negligible	Negligible	N/A
23	20.5	19.1	19.2	0.0	Negligible	Negligible	N/A
24	21.0	19.7	19.8	0.1	Negligible	Negligible	N/A
25	19.2	18.1	18.1	0.0	Negligible	Negligible	N/A
26	19.7	18.5	18.6	0.0	Negligible	Negligible	N/A
27	20.3	19.1	19.1	0.1	Negligible	Negligible	N/A

Receptor	PM_{10} concentrations (µg/m³)			Change in concentrations (µg/m³)	Impact descriptor	Impact descriptor using the previous 2010 guidance	Impact descriptor reported in the SES and AP2 ES
	2012 baseline	Without scheme	With scheme				
28	20.0	18.8	18.9	0.0	Negligible	Negligible	N/A
29	19.4	18.3	18.3	0.0	Negligible	Negligible	N/A
30	21.8	20.3	20.3	0.1	Negligible	Negligible	N/A
31	23.1	21.4	21.5	0.1	Negligible	Negligible	N/A
32	22.0	20.6	20.6	0.0	Negligible	Negligible	N/A

Table 6: Summary of mean 24-hour PM_{10} results (construction)

Receptor	Number of 24-hour mean PM_{10} exceedances			Change in number of 24-hour mean PM_{10} exceedances	Impact descriptor	Impact descriptor using the previous 2010 guidance	Impact descriptor reported in the SES and AP2 ES
	2012 baseline	Without scheme	With scheme				
16	6	4	4	0	Negligible	Negligible	Negligible
17	7	5	5	0	Negligible	Negligible	Negligible
18	3	2	2	0	Negligible	Negligible	N/A
19	5	3	3	0	Negligible	Negligible	N/A
20	5	3	3	0	Negligible	Negligible	N/A
21	5	3	3	0	Negligible	Negligible	N/A
22	2	1	1	0	Negligible	Negligible	N/A
23	4	2	2	0	Negligible	Negligible	N/A
24	5	3	3	0	Negligible	Negligible	N/A
25	3	1	1	0	Negligible	Negligible	N/A
26	3	2	2	0	Negligible	Negligible	N/A
27	4	2	2	0	Negligible	Negligible	N/A
28	3	2	2	0	Negligible	Negligible	N/A
29	3	2	2	0	Negligible	Negligible	N/A

Receptor	Number of 24-hour mean PM_{10} exceedances			Change in number of 24-hour mean PM_{10} exceedances	Impact descriptor	Impact descriptor using the previous 2010 guidance	Impact descriptor reported in the SES and AP2 ES
	2012 baseline	Without scheme	With scheme				
30	6	4	4	0	Negligible	Negligible	N/A
31	8	5	5	0	Negligible	Negligible	N/A
32	6	4	4	0	Negligible	Negligible	N/A

Permanent effects

3.1.14 There are no permanent effects anticipated to arise during construction of the proposed HEx depot.

Other mitigation measures

3.1.15 No other mitigation measures during construction are proposed in relation to air quality in this area.

Cumulative effects

3.1.16 The traffic data used for the assessment include the traffic changes expected from committed developments and therefore their impacts have been included within the assessment.

3.1.17 There are no new or different likely significant cumulative effects for air quality.

Summary of likely residual significant effects

3.1.18 The proposed change to the construction traffic flows will not give rise to a new or different significant residual effect on air quality and will not change the level of significance of the effects reported in the SES and AP2 ES.

Effects arising from operation

3.1.19 The SES3 changes do not change the operation of the scheme and so there are no new or different significant operation effects for air quality as a result of the proposed SES3 changes, in comparison with the AP2 ES.

3.2 Community

Introduction

3.2.1 This section of the report describes the environmental baseline in relation to community that is relevant to the SES3 assessment. It then identifies any new or different likely significant environmental effects as a result of the changes introduced in Section 2, compared those of the AP2 revised scheme.

Scope, assumptions and limitations

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

SES3 changes of relevance to this assessment

3.2.3 The change that is relevant to this assessment is the revision to the HEx depot Langley construction traffic assumptions (SES3-000-001).

Environmental baseline

Existing baseline

3.2.4 The baseline community information for the proposed HEx depot at Langley is described in the SES and AP2 ES, Volume 4: Off-route effects.

Future baseline

Construction (2017)

3.2.5 The future baseline for construction in 2017 remains unchanged from that reported in the SES and AP2 ES Volume 4: Off-route effects.

Operation (2020)

3.2.6 The future baseline for operation in 2020 remains unchanged from that reported in the SES and AP2 ES, Volume 4: Off-route effects.

Effects arising from construction

Avoidance and mitigation measures

3.2.7 No avoidance and mitigation measures additional to those reported in the SES and AP2 ES, Volume 4: Off-route effects are proposed.

Assessment of impacts and effects

Temporary effects

3.2.8 The construction of the proposed HEx depot will require additional HGV movements using the western access; Station Road and Langley Park Road. Residents along Langley Park Road (approximately 30 dwellings) are predicted to experience in-combination effects from a significant increase in HGVs and significant road noise effects. The affected dwellings are located on Langley Park Road, between the junctions with Hollow Hill Lane and Wood Lane.

3.2.9 Applying the methodology in Volume 1, the SMR (Volume 5: Appendix CT-001-000/1) and the SMR Addendum (Volume 5: Appendix CT-001-000/2), the impact magnitude is rated as moderate due to the combination of two significant effects acting together and, as the receptors are residents, the impact sensitivity is rated as high. This results in a major adverse effect on the amenity of residents, which is significant.

3.2.10 Significant effects on community resources are shown on Map CM-01-HEX (Volume 5, Community Map Book).

Other mitigation measures

3.2.11 No other mitigation measures during construction are proposed in relation to community in this area.

Cumulative effects

3.2.12 There are no new or different likely cumulative effects for community as a result of the proposed amendment acting in combination with another amendment in AP4, or in AP2, or as a result of any relevant committed development interacting with the SES3 change.

Summary of likely residual significant effects

3.2.13 The proposed change to the construction traffic flows will give rise to a new significant effect compared to that reported in the SES and AP2 ES Volume 4: Off-route effects. The amenity of residents (approximately 30 dwellings) on Langley Park Road is predicted to be adversely affected by the SES change due to a combination of a significant increase in HGV movements and significant road noise effect.

Effects arising from operation

3.2.14 The SES3 changes do not change the operation of the scheme and so there are no new or different significant operation effects for community as a result of the proposed SES3 changes, in comparison with the AP2 revised scheme.

3.3 Sound, noise and vibration

Introduction

3.3.1 This section of the report describes the environmental baseline in relation to sound, noise and vibration that is relevant to the SES3 assessment. It then identifies any new or different likely significant environmental effects as a result of the changes introduced in Section 2, compared those of the AP2 revised scheme.

Scope, assumptions and limitations

3.3.2 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.

3.3.3 Local assumptions and limitations for sound, noise and vibration are set out in the SES and AP2 ES Volume 4: Off-route effects section 2.20.

SES3 changes of relevance to this assessment

3.3.4 The change that is relevant to this assessment is the revision to the HEx depot, Langley, construction traffic assumptions (SES3-000-001).

Environmental baseline

Existing baseline

3.3.5 The baseline sound, noise and vibration information for the proposed HEx depot at Langley is described in the SES and AP2 ES, Volume 4: Off-route effects, Section 2.20.

Future baseline

Construction (2017)

3.3.6 The future baseline for construction in 2017 remains unchanged from that reported in the SES and AP2 ES Volume 4: Off-route effects, section 2.20.

Operation (2020)

3.3.7 The future baseline for operation in 2020 remains unchanged from that reported in the SES and AP2 ES, Volume 4: Off-route effects, section 2.20.

Effects arising from construction

Avoidance and mitigation measures

3.3.8 No avoidance and mitigation measures additional to those reported in the SES and AP2 ES, Volume 4: Off-route effects are proposed.

Assessment of impacts and effects

Temporary effects

3.3.9 Construction road traffic associated with the construction phases of the SES3 scheme will generate airborne noise. The change in traffic noise level at a reference distance of 10m from the edge of the nearside carriageway resulting from the presence of construction traffic for a given road has been predicted, based upon traffic information for the SES3 scheme.

3.3.10 The results for the roads where additional potentially significant effects could arise as a result of the proposed HEx depot are presented in Table 7.

3.3.11 Explanation of the information within Table 7 is provided in the Main ES Volume 5: Appendix SV-001-000, with the following additional notes:

Table 7 key

	Where the significant effect column is highlighted in dark red, then a significant effect is identified on nearby communities or individual receptors

Change values

	Yellow denotes a minor impact – a change is of 3-5 dB or 1-3dB where a high existing sound level is identified
	Orange denotes a moderate impact – a change is of 5-10 dB or 3-5dB where a high existing sound level is identified
	Red denotes a major impact – a change is of >10 dB or >5dB where a high existing sound level is identified

Table 7: Assessment of construction traffic noise levels

Road name	Future baseline sound level (dB)	Future baseline sound level + construction traffic (dB)	Change (dB)	Significant effect
	Daytime[2]	Daytime[2]		
Langley Park Road	68.3	69.4	+1.1	CSV27-C04

3.3.12 The change to the construction traffic flows will give rise to a new significant effect compared to that reported in the SES and AP2 ES Volume 4 – Off-route effects, specifically that construction traffic is likely to cause adverse noise effects to residential receptors along Langley Park Road (CSV27-C04). Approximately 30 dwellings located immediately adjacent to Langley Park Road between Hollow Hill Lane and Wood Lane are forecast to experience an increase in outdoor noise levels of around 1dB in an area where there is a high existing baseline sound level during the peak months.

3.3.13 This adverse effect would be a change in the acoustic character of the area such that there is a perceived change in the quality of life. This new effect is considered to be significant when assessed on a community basis taking account of the local context.

3.3.14 Conversely, the indirect effect reported in the SES and AP2 ES Vol4 Off-route effects, section 2.20 (CSV27-C03) at approximately 19 dwellings as the result of construction traffic along Bangors Road South is removed by the SES3 change.

Other mitigation measures

3.3.15 No other mitigation measures during construction are proposed in relation to sound, noise and vibration in this area.

Cumulative effects

3.3.16 The traffic data used for the assessment include the traffic changes expected from committed developments and therefore their impacts have been included within the assessment.

Summary of likely residual significant effects

3.3.17 The proposed change to the construction traffic flows will give rise to a new significant effect compared to that reported in the SES and AP2 ES Volume 4 – Off-route effects, specifically that construction traffic is likely to cause adverse noise effects to residential receptors along Langley Park Road (CSV27-C04). Approximately 30 dwellings located immediately adjacent to the road are forecast to experience an increase in outdoor noise levels of around 1 dB, in an area where there is a high existing baseline sound level during the peak months.

3.3.18 This adverse effect would be a change in the acoustic character of the area such that there is a perceived change in the quality of life. The effect is considered to be

[2] L_{pAeq},16hr, 0700-23:00 free-field.

significant and residual when assessed on a community basis taking account of the local context.

3.3.19 The indirect significant residual effect reported in the SES and AP2 ES Vol4 – Off-route effects, section 2.20 (CSV27-C03) at approximately 19 dwellings as the result of construction traffic along Bangors Road South is removed by the SES3 change.

Effects arising from operation

3.3.20 The SES3 scheme does not result in any new or different significant effects for sound, noise and vibration compared with the SES and AP2 ES.

3.4 Traffic and transport

Introduction

3.4.1 This section of the report describes the environmental baseline in relation to traffic and transport that is relevant to the SES3 assessment. It then identifies any new or different likely significant environmental effects as a result of the changes introduced in Section 2, compared to those of the AP2 revised scheme, taking into account other AP2 amendments.

Scope, assumptions and limitations

3.4.2 The assessment scope, key assumptions and limitations for traffic and transport are as set out in Volume 1, the SMR (Volume 5: Appendix CT-001 -000/1) and the SMR Addendum (Volume 5: Appendix CT-001-000/2) of the main ES as updated in the SES and AP2 ES.

SES3 changes of relevance to this assessment

3.4.3 The change that is relevant to this assessment is the revision to the HEx depot, Langley, construction traffic assumptions (SES3-000-001).

Environmental baseline

Existing baseline

3.4.4 The baseline traffic and transport information for the proposed HEx depot, Langley, is as described in the SES and AP2 ES, Volume 4: Off-route effects, Section 2.21.

Future baseline

Construction (2018)

3.4.5 The future baseline for construction in 2018 remains unchanged from that reported in SES and AP2 ES, Volume 4: Off-route effects, section 2.21.

Operation (2026 and 2041)

3.4.6 The future baselines for operation in 2026 and 2041 remain unchanged from those reported in the SES and AP2 ES, Volume 4: Off-route effects, section 2.21.

Effects arising during construction

Avoidance and mitigation measures

3.4.7 No avoidance and mitigation measures additional to those reported in the SES and AP2 ES, Volume 4: Off-route effects are proposed.

Assessment of impacts and effects

Temporary effects

3.4.8 HGV movements to and from the proposed HEx depot site during the peak construction period will average 500 HGV combined two-way trips/day (equivalent to 25 HGV movements per direction/hour) for approximately 12 months from Q3 2017, reducing to less than 50 HGVs combined two-way trips/day outside of the peak construction period. This is unchanged from the AP2 revised scheme. However, the use of the proposed construction traffic routes has been revised.

3.4.9 Construction traffic will travel to/from the proposed HEx depot site primarily using the western access, Station Road and Langley Park Road. A more limited volume of traffic will travel to and from the site via Thorney Lane to the east. The proposed construction lorry routes are:

- western access: to/from the north of the site via M40/A40 (Junction 1 – Denham Roundabout), A412, Wood Lane, Langley Park Road, Station Road and Station Approach;
- eastern access: to/from the north of the site via M40/A40 (Junction 1 – Denham Roundabout), A412 Denham Road, Bangors Road (North and South), High Street, Thorney Lane North and Thorney Lane Business Park; and
- eastern access: to/from the south of the site via M4 (Junction 5 Langley Roundabout), London Road, Sutton Lane, North Park, Richings Way, Thorney Lane South and Thorney Lane Business Park.

3.4.10 The proposed construction traffic routes are shown on maps CT-05-154 to CT-05-155 in SES and AP2 ES Volume 4: Off-Route Effects Map Book.

3.4.11 For construction, the directional traffic distribution will be 70% via the west access northwards to the A40/M40, 15% via the eastern access northwards and 15% via the eastern access southwards to the A4/M4. Compared to the AP2 revised scheme, this reduces construction traffic northbound from the eastern access by almost 80% and southbound from the eastern access by 25%. For each of the eastern access routes this is equivalent to approximately four HGV trips per direction per hour in the peak construction traffic period. However construction traffic on the western route will increase to 18 HGV trips per direction per hour in the peak construction traffic period.

3.4.12 HS2 construction traffic results in small changes in the peak period on most of the routes used by construction traffic with the exception of the following routes that experience an increase in HGV traffic:

- North Park (an increase of 20% in HGVs in the AM and 25% in HGV in the PM peak traffic hours);
- Sutton Lane (an increase of 35% in HGVs in the AM and 42% in HGV in the PM

peak traffic hours);

- A412 (an increase of 76% in HGVs in the AM peak and 105% in the PM peak);
- Wood Lane (an increase of 116% in HGVs in the AM peak and 144% in the PM peak);
- Langley Park Road (an increase of 144% in HGVs in the AM peak and 189% in the PM peak);
- Bangors Road (an increase of 47% in HGVs in the AM peak and 50% in the PM peak); and
- Thorney Lane (an increase of 31% in HGVs in the AM and PM peak traffic hours).

3.4.13 Despite large percentage increases in HGV flows on these roads, the increases in overall traffic levels in the AM and PM peak periods on these route ranges between 1-4 % for the western access and around 1% for the eastern access.

3.4.14 The revised traffic flows using the western access will result in increases in HGV flows and result in new significant effects in relation to congestion[3] and delays for road users at the following junctions:

- Wood Lane/Uxbridge Road/A412 Church Road – moderate adverse;
- Langley Park Road/Wood Lane – moderate adverse; and
- Langley Park Road/Station Approach road – moderate adverse.

3.4.15 The reduction in HGV flows using the eastern access will change or remove significant effects in relation to congestion and delays at the following junctions:

- High Street, Iver/Thorney Lane North – the moderate adverse effect reported in Part 2 of the SES and AP2 ES is removed;
- Bangors Road South/Iver High Street – a minor adverse effect (moderate adverse effect reported in Part 2 of the SES and AP2 ES); and
- Bangors Road/A4007 Slough Road – the moderate adverse effect reported in Part 2 of the SES and AP2 ES is removed.

[3] In assessing significant effects of traffic changes on congestion and delays, a major adverse effect occurs where traffic flows at a junction will be beyond or very close to capacity with the scheme and the increases in traffic due to the scheme will be such as to substantially increase queues and delays on a routine basis at peak times. A moderate adverse effect will occur when traffic flows at a junction will be approaching or at capacity with the scheme and modest increases in traffic will increase the frequency of queues and more substantial delays. A minor adverse effect occurs when traffic flows at a junction are not generally exceeding capacity with the scheme but the increase in flows will result in occasional queues and delays or small increases in existing delays.

3.4.16 The changes in HGV traffic accessing the western access also result in new and different adverse significant effects in relation to traffic related severance[4] for non-motorised road users on:

- A412 Church Road (between Wood Lane and Bangors Road North) – new moderate adverse effect;
- Wood Lane (between Langley Park Road and the A412) – new major adverse effect; and
- Langley Park Road (between Station Approach and Wood Lane) – major adverse effect (moderate adverse in SES and AP2 ES).

3.4.17 The reduction in HGV flows using the eastern access result in different significant effects in relation to traffic related severance for non-motorised road users at the following locations:

- Bangors Lane (between High Street, Iver and A412 Denham Road) – moderate adverse significant effect (major adverse in SES and AP2 ES); and
- Thorney Lane (between Ridgeway and High Street, Iver) – minor adverse significant effect (major adverse in SES and AP2 ES).

Permanent effects

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

Other mitigation measures

3.4.19 The changes to construction assumptions will provide mitigation of traffic and transport effects. No further changes to the mitigation measures reported in the SES and AP2 ES, Volume 4 – Off-route effects, Section 2.21 are required.

Cumulative effects

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

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

Summary of likely residual significant effects

3.4.22 There will be new adverse significant effects in relation to traffic related severance for non-motorised users at Wood Lane and at A412 Church Road and there will be an increased adverse significant residual traffic related severance effect on Langley Park Road compared to that reported in Part 2 of the SES and AP2 ES.

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

3.4.23 The significant adverse residual effect in relation to traffic related severance for non-motorised users of Thorney Lane North and Bangors Road will be reduced compared to that reported in Part 2 of the SES and AP2 ES.

3.4.24 There will be new adverse significant residual effects in relation to congestion and delays at the junctions of Wood Lane/Uxbridge Road/A412 Church Road, Langley Park Road/Wood Lane and Langley Park Road/Station Approach due to increased construction traffic.

3.4.25 The adverse significant residual effects due to increased congestion and delays at Bangor Road/High Street Iver will reduce compared to that reported in Part 2 of the SES and AP2 ES and the adverse effects at the junction of High Street Iver/Thorney Lane North and at Bangors Road/A4007 Slough Road will be removed.

3.4.26 The changes to the significant effects are shown on the TR-03-HEx map series in SES3 and AP4 ES Volume 5: Traffic and Transport Map Book.

Effects arising from operation

3.4.27 The SES3 changes do not change the operation of the scheme and so there are no new or different significant operation effects for traffic and transport as a result of the proposed SES3 changes, in comparison with the AP2 revised scheme.

Part 2: Additional Provision 4 Environmental Statement

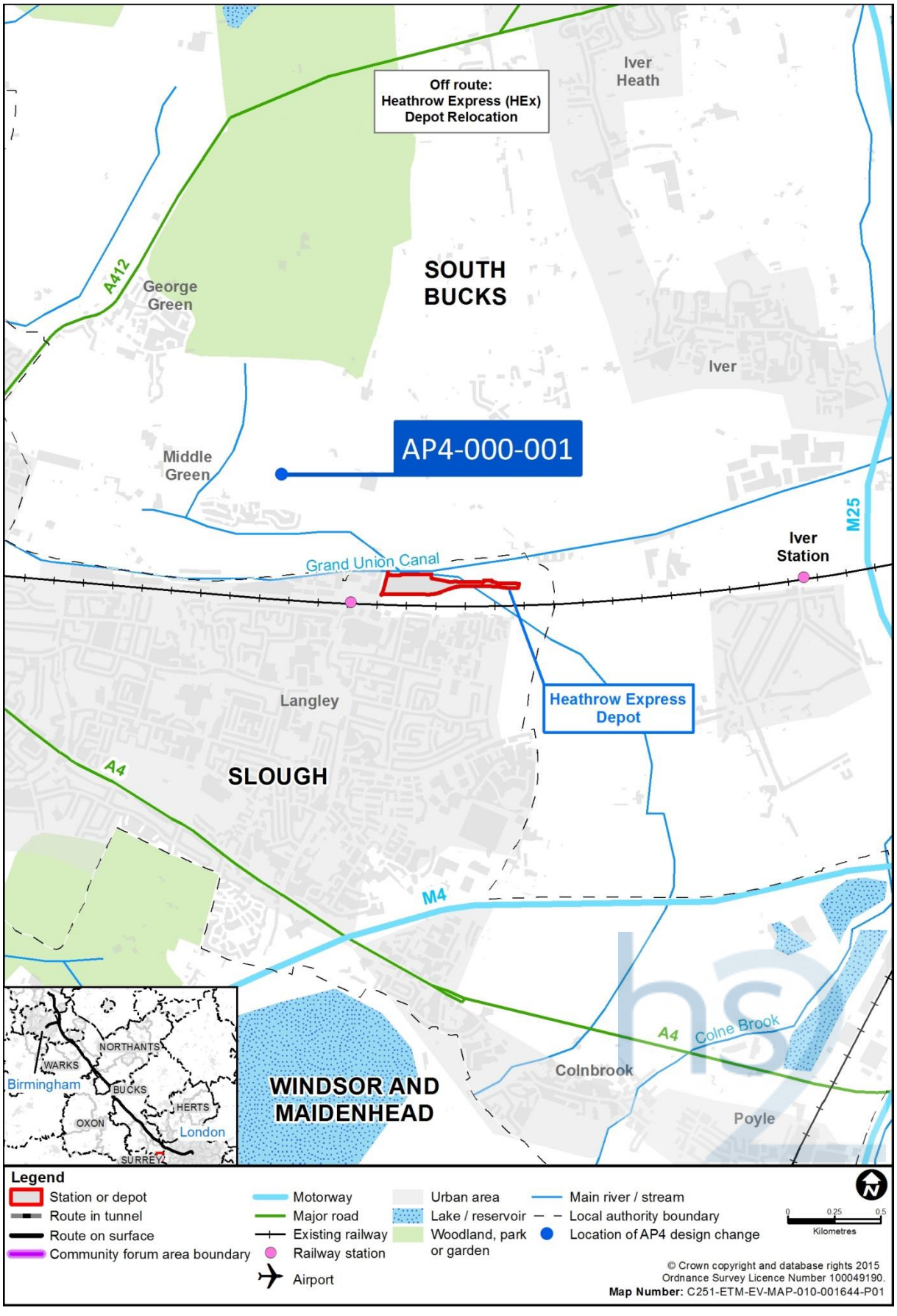
4 Summary of amendment

4.1.1 Table 8 provides a summary of the amendment off-route and Figure 3 shows the location.

Table 8: Summary of amendment off-route

Name of amendment	Description of the AP2 revised scheme	Description of the AP4 revised scheme
Additional land for ecological mitigation at Langley (AP4-000-001)	No additional land for ecological mitigation at Langley was proposed in the AP2 revised scheme.	Provision of potential replacement habitat for protected species present at Langley, within land north-west of Langley station.

Figure 3: Location of off-route amendment



5 Assessment of amendment

5.1 Additional land for ecological mitigation at Langley (AP4-000-001)

5.1.1 Volume 4, Section 2.16 of the SES and AP2 ES reported the assessment of the proposed relocation of the HEx depot to Langley, Slough (AP2-000-001).

5.1.2 This identified that the construction of the proposed HEx depot would result in the permanent loss of approximately 40 hectares of habitat including a former attenuation pond, a section of the Horton Brook, and mosaic habitat including semi-natural broadleaved woodland, scrub, semi-improved neutral grassland and tall ruderals.

5.1.3 Based on a precautionary approach the land required is identified as potentially suitable to support a range of protected and/or notable species including great crested newt, bats, reptiles, birds and terrestrial invertebrates.

5.1.4 The SES and AP2 ES (Volume 4: Section 2.16) reported that based on the precautionary assessment undertaken, there will be a requirement for replacement habitat to be created prior to the loss of land required for the HEx depot, so that translocation of fauna species, including great crested newt and reptiles, can be undertaken prior to the loss of their existing supporting habitat from the HEx depot site. Areas for replacement habitat creation are unlikely to be available within the HEx depot site boundary until the construction work is complete, hence additional land will be required outside the HEx depot boundary to accommodate these species if they are found to be present.

5.1.5 In the absence of developed mitigation measures Volume 4 of the SES and AP2 ES reported that significant residual effects would remain, at up to county/metropolitan level for great crested newt, and at up to district/borough level for the habitat mosaic, reptiles, bats, breeding birds and terrestrial invertebrates.

5.1.6 Since submission of the SES and AP2 ES, work to identify possible suitable off-site ecological mitigation areas has been undertaken within land surrounding the proposed HEx depot site bounded by the A412 to the north and west, the M25 to the east and the M4 to the south. An additional area of approximately 18ha, outside the land included in the AP2 revised scheme has been identified to provide ecological mitigation. The additional 18ha area is located on land north of the Grand Union Canal, approximately 380m north-west of the proposed HEx depot site, to the north of Pickford Drive and to the west of Trenches Lane (refer to maps CT-05-156 and CT-06-156). The additional land comprises rough/semi-improved grassland fringed with trees, hedgerows and scrub habitat.

5.1.7 This site is considered to be a suitable size and sufficiently close to the proposed HEx depot site from which species would be translocated. In addition the land is considered likely to be suitable for ecological enhancement and replacement habitat creation for the translocation of fauna species from the proposed HEx depot site. The replacement habitat would include the creation of new waterbodies for great crested newts, the provision of additional features such as log piles and refugia for reptiles, and the potential provision of replacement badger setts and associated foraging

areas. The existing trees and hedgerows within the ecological mitigation area will be retained. Any trees or hedgerows lost to provide access from Trenches Lane will be compensated through replacement planting.

5.1.8 During creation of the ecological mitigation area it may be necessary to temporarily divert or close Footpath WEX/13/2. The intention is to have only short-term closures with local diversions. However, if a full closure is necessary then users would have to use other existing footpaths during the closure. On a precautionary basis, the assessment assumes a closure of over four weeks. The alternative routes available would increase travel distance for users by up to 400m.

5.1.9 The additional land required for ecological mitigation is not considered to make changes that require a reassessment of the environmental effects or proposed mitigation as set out in the main ES for: air quality, community, land quality, landscape and visual assessment, socio-economics, sound, noise and vibration, and water resources and FRA. However, there were changes where reassessment was considered to be required for: agriculture, forestry and soils, cultural heritage, ecology, and traffic and transport.

Agriculture, forestry and soils

Introduction

5.1.10 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 AP2 revised scheme.

Scope, assumptions and limitations

5.1.11 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.

5.1.12 Although some of the land proposed for ecological mitigation may be used for livestock grazing as part of its ongoing management, any agricultural use of the land would be incidental to its primary ecological use and purpose. As such, this assessment assumes a worst-case that all of the land proposed for ecological mitigation would cease to be available for agriculture.

Existing baseline

5.1.13 The bedrock geology mapped by the British Geological Survey consists of the London Clay Formation, comprising silty clay and clay. This is overlain by superficial deposits of the Langley Silt Member which also varies from silt to clay.

5.1.14 The Soil Survey of England and Wales 1:250,000 scale map shows soils at the site to be of the Park Gate association. Park Gate soils are characterised by aeolian, fine silty or loamy topsoils, overlaying poorly permeable clay subsoils.

5.1.15 The deep, aeolian, fine silty or loamy Park Gate soils are moderately to poorly permeable and moderately to poorly drained (Wetness Class (WC) III or IV).

5.1.16 As a detailed survey has not been possible due to access restrictions, the assessment of Agricultural Land Classification has been carried out according to the Ministry of Agriculture, Fisheries and Food (MAFF) revised guidelines (1988)[5] using available background data. The main factor affecting the classification of the land at this site is likely to be soil wetness and workability. Soils of WC III would be of Subgrade 3a if the topsoil texture is of silt loam or medium silty clay loam, whilst heavy silty clay loam topsoil would result in a limitation to Subgrade 3b. Profiles of WC IV would all be of Subgrade 3b. For the purposes of the assessment it is assumed to be best and most versatile (BMV) land is Subgrade 3a.

5.1.17 One holding (HEx/2 shown on AG-01-HEx within SES3 and AP4 ES Volume 5, Technical Appendices map book, Agriculture, forestry and soils) will be affected by the amendment. However, no details are available as to the extent of the holding, or agricultural land use, albeit it is thought to be owned by an aggregate quarrying company and is assumed to be rented to an agricultural tenant or lessee. The land affected comprises rough/semi-improved pasture.

5.1.18 A narrow strip of woodland runs along much of the southern boundary of the holding.

Future baseline

Construction (2017)

5.1.19 The future baseline for construction in 2017 remains unchanged from that reported in the SES and AP2 ES, Volume 4, Section 2.12.

Operation (2020)

5.1.20 The future baseline for operation in 2020 remains unchanged from that reported in the SES and AP2 ES, Volume 4, Section 2.12.

Effects arising during construction

5.1.21 During the construction phase, the total area of agricultural land required by this amendment will be approximately 18ha. This is assessed as an impact of high magnitude because the land is taken permanently out of agricultural use. Land of BMV agricultural quality in this area is a receptor of low sensitivity, as it is prevalent in the area. Therefore the temporary effect arising from this amendment on BMV land is assessed as a new moderate adverse effect, which is significant.

5.1.22 This amendment would increase the total area of BMV land required for the HEx depot to 24ha. It is considered to comprise a new significant effect compared to the AP2 scheme.

5.1.23 This amendment will also give rise to a new permanent adverse effect for the unidentified holding. However, the apparent low key and incidental agricultural use of the land would suggest that this effect is unlikely to be significant.

[5] MAFF (1988). Agricultural Land Classification of England and Wales. Revised guidelines and criteria for grading the quality of agricultural land. MAFF Publications.

Effects arising from operation

5.1.24 The proposed land for ecological mitigation will not give rise to a new or different significant effect on agricultural land and agricultural holdings and will not change the level of significance of the effects reported in the SES and AP2 ES.

Mitigation and residual effects

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

5.1.26 This amendment will increase the area of BMV land required for the HEx depot to 24ha. This is considered to result in a different residual significant effect compared with those reported in the SES and AP2 ES, Volume 4, Section 2.12.

5.1.27 There will be a new adverse effect on an unidentified holding, although this is unlikely to be significant.

Cumulative effects

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

Cultural heritage

Introduction

5.1.29 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 AP2 revised scheme.

Scope, assumptions and limitations

5.1.30 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.

5.1.31 Historic Environment Record (HER) data was not available during the SES2 and AP2 ES assessment. This was therefore a limitation when undertaking the assessment. In the absence of HER data, data from the online Heritage Gateway was utilised to provide information relating to the potential archaeological assets that may be present. The Heritage Gateway holds a summary of HER data as well as data from the Historic England Pastscape and National Monument Record Excavation Index for the study area. However, the datasets on Heritage Gateway represent a summary of the HER, and may not include the most up-to-date data.

5.1.32 The HER data was used to assess the effects of the amendment. However, it was not possible to undertake a walk-over survey of the land required for the amendment.

Existing baseline

5.1.33 The cultural heritage baseline for the assessment takes into account information collected for the SES and AP2 ES. This included data from national and local registers.

A full list of heritage assets is provided in Volume 4, Section 2.15 of the SES and AP2 ES.

5.1.34 A summary of the baseline information relevant to the assessment of new or different effects is provided below. Further details are provided in the gazetteer of heritage assets and impact assessment tables in Volume 5 (SES3 and AP4 ES Appendices HEx-CH-002 and HEx-CH-003) and are shown on map CH-01-HEx (Heritage Assets within Study Area). For those assets described in the SES and AP2 ES, further details are provided in the baseline reports, gazetteer of heritage assets, impact assessment tables and survey reports in Volume 5: Off-route appendices of the SES and AP2 ES and are shown on maps CH-01-HEx (Heritage Assets within Study Area), CH-02-HEx (Designated Heritage Assets) and CH-03-HEx Archaeological Character Sub-zones.

Designated assets

5.1.35 There are no designated assets within the land required ecological mitigation. The following designated heritage assets have been identified located within 1km, in addition to the assets identified within the SES and AP2 ES are of the revised depot location (see Maps CH-01-HEx, Volume 5, Cultural Heritage Map Book):

- a Grade II registered park and Garden Langley Park (asset reference[6] LAN042); and
- Grade II listed buildings at:
  - Manor House, Middle Green (asset reference LAN043);
  - The Priory, Middle Green (asset reference LAN044);
  - Lodge to Manor House, Middle Green (asset reference LAN045);
  - Entrance Lodge and Gate to Langley Park (asset reference LAN046);
  - Home Cottage, Middle Green (asset reference LAN047); and
  - The Marish, Middle Green (asset reference LAN048).

Non-designated assets

5.1.36 The land required for the amendment includes one non-designated heritage asset. The 1603 extent of Langley Park (asset reference6 LAN041). The asset was not assessed as part of the SES and AP2 ES, as it was located beyond the 500m study area.

5.1.37 The 1603 extent of Langley Park (LAN041) was first mapped in 1603 and its southern extent included the area of the additional land required for the ecological mitigation. The parkland was recorded as containing various woodland enclosures with extensive areas of lawn and fallow deer.

5.1.38 The parkland was extensively remodelled during the 18th century but may have excluded the area of land required for ecological mitigation during this period. The land required for the ecological mitigation falls outside the designated part of Langley

[6] Asset references refer to the gazetteer of heritage assets in Volume 5 of the main ES.

Park (LAN042) a Grade II Registered Park and Garden which is located 400m to the north. The 1603 mapped area of the parkland has been identified as a Buckinghamshire Archaeological (Priority) Notification Area, as it represents the remains of an early post-medieval hunting park. The rural nature and existing boundaries give this area a strong connection with the surviving designated elements of the park (400m) to the north. The asset is therefore of moderate value.

Future baseline

Construction (2017)

5.1.39 None of the identified future committed developments affect the assessment of the likely construction impacts on heritage assets.

Operation (2020)

5.1.40 No committed developments have been identified in this local area that will alter the baseline conditions in 2020.

Effects arising during construction

5.1.41 In the SES and AP2 ES no significant effect was identified on the assets associated with the 1603 extent of Langley Park (LAN041).

5.1.42 The proposed ecological mitigation works will involve ground works during the construction of the mitigation features including the water features. These works will potentially cause a new permanent physical impact on the 1603 extent of Langley Park (LAN041) a heritage asset of moderate value, by partially truncating and/or removing in-situ buried archaeological remains associated with the early post medieval hunting park. In addition the ecological works will alter the appreciation of the setting and historic context of wider parkland remains, by changing the area's current agricultural character and introducing new physical features including water bodies. The removal of in-situ archaeological remains and the change of setting to the wider parkland features will cause a new medium adverse impact resulting in a new moderate adverse effect, which is significant.

Effects arising during operation

5.1.43 There will be no new or different physical impacts on buried archaeological remains or other heritage assets arising from the operation of the proposed HEx depot from the inclusion of the additional land required for the ecological mitigation.

5.1.44 No new or different significant effects will occur as a result of operational effects on the setting of designated heritage assets.

Mitigation and residual effects

5.1.45 There will be no change to the mitigation reported in Volume 4 of the SES and AP2 ES. The new moderate adverse effect on Langley Park (LAN041) will be residual.

Cumulative effects

5.1.46 There are no new or different likely significant cumulative effects for cultural heritage as a result of the AP4 amendment interacting with the AP2 amendment or any relevant committed development.

Ecology

Introduction

5.1.47 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 AP2 revised scheme.

Scope, assumptions and limitations

5.1.48 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 is 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 and in Addendum 4 to the SMR (SES3 and AP4 ES Volume 5: Appendix CT-001-000/5).

5.1.49 Access was requested but was not obtained to the 18ha of land required for the amendment, and hence it has not been possible to undertake any of the field surveys required (i.e. Phase 1 habitat survey and further species surveys). Information about the habitats present on the amendment site has been obtained through a review of published aerial photography and inspection from public rights of way.

5.1.50 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

Designated sites

5.1.51 There are no statutory or non-statutory designated sites that are relevant to the assessment of the amendment. However, a Biodiversity Opportunity Area, shown in the Development Plan for the area[7], covers the northern extremity of the amendment site.

Habitats

5.1.52 From aerial imagery, habitats across the land required for the amendment appear to include large grazed grassland fields with only the occasional dividing hedgerow, and with a small number of scattered trees and areas of scrub. A dense tree belt is present along the southern boundary of the area and hedgerows are located along part of the eastern and north-western boundary. Field survey is required to confirm these habitats and their species composition. In the absence of survey it has been assumed that all the habitats present are of up to district/borough value.

[7] South Bucks Local Development Framework: Core Strategy, Adopted February 2011

Protected and/or notable species

5.1.53 The habitats identified above may be suitable for bats (roosting and foraging), badgers, breeding birds, wintering birds, great crested newts, reptiles and terrestrial invertebrates. Given the habitats present on the site (predominantly grazed grassland fields), the populations of these species present are likely to be of up to district/borough value. The presence of protected and notable species will need to be confirmed by field survey.

Future baseline

Construction (2017)

5.1.54 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 under the same reference number in the main ES and the SES and AP2 ES.

5.1.55 None of the identified developments affect the assessment of the amendment's likely construction impacts on ecology.

Operation (2020)

5.1.56 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 2020, additional to those identified under the same reference number in the main ES and the SES and AP2 ES.

5.1.57 None of the identified developments affect the assessment of the amendment's likely operational impacts on ecology.

Effects arising during construction

Avoidance and mitigation measures

5.1.58 The purpose of the land required for the amendment is to provide mitigation for the effects on habitats and species which are likely from the development of the HEx depot (SES and AP2 ES, Volume 4; Section 3.16). As all land within the HEx depot boundary will be lost, there will be a requirement for new habitat to be created and species translocated.The development of a mosaic of habitats, through creation of new habitats such as scrub, scattered trees and ponds, and enhancement of existing habitats including grassland, will provide new and improved foraging habitat for the protected and notable species groups previously identified above, and nesting habitats for birds. In developing these habitats other species specific measures will be included (e.g. log piles for great crested newts, reptiles and invertebrates, longer grassland as terrestrial habitat for great crested newts, boxes for roosting bats).

5.1.59 Mitigation will be carried out in accordance with the Ecology technical note: Ecological principles of mitigation (main ES Volume 5: Appendix CT-001-000/2). This will be sufficient to maintain the favourable conservation status of each population affected.

5.1.60 As the proposed amendment is located in an area that is not affected by the SES3 scheme, this following assessment assumes the implementation of these mitigation

measures as part of the main assessment. In addition 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

5.1.61 The proposed amendment would not result in any new or different effects on designated sites. The ecological enhancement will contribute towards the aims of the Biodiversity Opportunity Area (BOA) which seeks to contribute to a net gain of biodiversity in the local plan area. The amendment will result in no new or different significant adverse effects.

Habitats

5.1.62 The creation of ponds, scrub and scattered trees will reduce the area of semi-improved grassland which may be of up to district/borough value. However, retained areas of grassland will be managed to increase their species-diversity, and the introduction of these habitats will enhance the ecological value of the site, and will form a mosaic of habitats to replace those lost on the HEx depot site. The exact composition of the mitigation provision within the land required for the amendment will be informed by the results of baseline surveys at the proposed HEx depot site. However, the amendment will create habitats in line with the aims of the BOA and will seek to compensate for any adverse effects on habitats arising from the proposed HEx depot. Therefore, no new or different significant adverse effects on habitat receptors will occur, and depending on the nature of the habitats present within the proposed HEx depot site, there is the potential for beneficial effects.

Protected and/or notable species

5.1.63 The works proposed will enhance the suitability of the land to accommodate protected and notable species to be translocated from the HEx depot site (as required), and improve the existing habitat for species currently using the site. The amendment will result in no new or different significant adverse effects on protected and/or notable species, and will seek to compensate for any adverse effects on species arising from the proposed HEx depot AP2 amendment. Depending on the species population present within the proposed HEx depot site, there is the potential for beneficial effects.

Cumulative effects

5.1.64 There are no new or different likely significant cumulative effects for ecology as a result of the AP4 amendment interacting with the AP2 amendment or any relevant committed development.

Mitigation and residual effects

Other mitigation measures

5.1.65 The amendment consists of solely mitigation provision and therefore all mitigation measures associated with the amendment are described under 'Avoidance and mitigation measures' above.

Summary of likely residual effects

5.1.66 Following the implementation of the mitigation measures, the residual significant effects on ecology receptors reported in the SES and AP2 ES in relation to HEx depot amendment will be removed. These adverse effects included loss of mosaic habitats at up to the district/borough value, loss of waterbodies at up to the county/metropolitan level, effects on great crested newts at up to the county/metropolitan level, and effects on common reptiles, breeding birds, bats, and terrestrial invertebrates at up to the district/borough level.

Effects arising from operation

5.1.67 Section 3.16 of the SES and AP2 ES Volume 4 report identified no significant operational ecological effects. As this amendment relates only to land required for ecological mitigation, there are no relevant updates regarding operation required for this amendment.

Traffic and transport

Introduction

5.1.68 This section of the report describes the environmental baseline in relation to traffic and transport that is relevant to the SES3 assessment. It then identifies any new or different likely significant environmental effects as a result of the changes introduced in Section 2, compared to those of the AP2 revised scheme.

Scope, assumptions and limitations

5.1.69 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 as updated in the SES and AP2 ES.

Existing baseline

5.1.70 The baseline traffic and transport information for the proposed HEx depot, Langley, is as described in the SES and AP2 ES, Volume 4: Off-route effects, Section 2.21.

Future baseline

Construction (2018)

5.1.71 The future baseline for construction in 2018 remains unchanged from that reported in SES and AP2 ES, Volume 4: Off-route effects, section 2.21.

Operation (2026 and 2041)

5.1.72 The future baselines for operation in 2026 and 2041 remain unchanged from that reported in the SES and AP2 ES, Volume 4: Off-route effects, section 2.21.

Effects arising during construction

5.1.73 During the works to create the ecological mitigation area it may be necessary to temporarily divert or close Footpath WEX/13/2. The intention is to have only short-term closures with local diversions. However, if a full closure is necessary then users would have to use other existing footpaths during the closure. On a precautionary

basis, the assessment assumes a closure of over four weeks. The alternative routes available would increase travel distance for users by up to 400m. This would result in a moderate adverse significant severance effect due to the increased travel distance involved in the diversion.

5.1.74 The significant effects that result from construction are shown on Map TR-03-HEX (SES3 and AP4 ES Volume 5, Traffic and Transport, CFA9 Map Book).

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

Effects arising from operation

5.1.76 The footpath diversion is temporary and and so there are no new or different significant operation effects for traffic and transport as a result of the amendment, in comparison with the SES3 scheme.

Mitigation and residual effects

5.1.77 No additional mitigation measures in addition to those identified in the main ES and the SES and AP2 ES are required.

5.1.78 There is one new temporary moderate adverse significant residual severance effect due to the diversion of Footpath WEX/13/2.

Cumulative effects

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

5.1.80 There are no new or different likely significant cumulative effects for traffic and transport as a result of the AP4 amendment interacting with the AP2 amendment.

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

5.1.81 The additional land for ecological mitigation at Langley will give rise to a different significant residual effect on agricultural land due to an increase in land take and a new significant effect upon one agricultural holding.

5.1.82 The ecological mitigation works will cause a new permanent impact on cultural heritage by truncating/removing archaeological remains of the early post medieval hunting park and altering the appreciation of the setting and historic context of wider parkland remains. This will result in a new moderate adverse significant residual effect.

5.1.83 The establishment of the replacement habitat for ecological mitigation area would remove the significant residual effects reported in the SES and AP2 ES associated with the loss of habitats and effects on protected species.

5.1.84 There is also one new moderate adverse significant residual severance effect due to the potential temporary diversion of Footpath WEX/13/2.

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