HS2

High Speed Rail (West Midlands - Crewe)

Supplementary Environmental Statement 2 and Additional Provision 2 Environmental Statement

Volume 5: Technical appendices

CA2: Colwich to Yarlet
Flood risk assessment (WR-003-002)

February 2019

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Department for Transport

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A report prepared for High Speed Two (HS2) Limited:

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Contents

List of tables

List of figures

1 Introduction

1.1 Structure of this appendix

1.1.1 This document is an appendix to the water resources and flood risk assessment which forms part of Volume 5 of the Supplementary Environmental Statement 2 (SES2) and Additional Provision 2 Environmental Statement (AP2 ES) for the Colwich to Yarlet community area (CA2).

1.1.2 This appendix provides details of changes to the flood risk assessment (FRA) since the production of the High Speed Two (HS2) Phase 2a (West Midlands - Crewe) Environmental Statement (ES)[1] published in July 2017 (the main ES), as well as the Supplementary Environmental Statement (SES1) and Additional Provision Environmental Statement (AP1 ES) published in March 2018[2].

1.1.3 This report should be read in conjunction with Volume 5, Appendix WR-003-002 of the main ES.

1.1.4 In order to differentiate between the original scheme and the subsequent changes, the following terms are used:

- 'the original scheme' – the Bill scheme submitted to Parliament in July 2017, which was assessed in the main ES;
- 'the SES1 scheme' – the original scheme with the changes described in the SES1 submitted in March 2018;
- 'the AP1 revised scheme' – the SES1 scheme as amended by the AP1 submitted in March 2018;
- 'the SES2 scheme' – the SES1 scheme with the changes described in the SES2; and
- 'the AP2 revised scheme' – the SES2 scheme as amended by the AP2.

1.1.5 This FRA considers two AP2 amendments; no SES2 changes were identified in the Colwich to Yarlet area that had implications for flood risk.

1.1.6 Separate reports describing the original hydraulic modelling of Bourne Brook and Luth Burn described in this assessment can be found in Background Information and Data (BID) which accompanied the main ES (see BID WR-004-007[3]).

1.1.7 Maps referred to in this appendix are contained in the main ES Volume 5, Water resources and flood risk Map Book.

[1] HS2 Ltd (2017), *High Speed Two (HS2) Phase 2a (West Midlands - Crewe), Environmental Statement*, https://www.gov.uk/government/collections/hs2-phase-2a-environmental-statement

[2] HS2 Ltd (2018), *High Speed Two (HS2) Phase 2a (West Midlands - Crewe), Supplementary Environmental Statement and Additional Provision Environmental Statement*, https://www.gov.uk/government/collections/hs2-phase-2a-supplementary-environmental-statement-and-additional-provision-environmental-statement

[3] HS2 Ltd (2017), *High Speed Two (HS2) Phase 2a (West Midlands - Crewe), Background Information and Data to accompany Environmental Statement, Hydraulic modelling report - Filly Brook,* https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/627377/E137_BID-WR-004-007_WEB.pdf

1.2 Assessment methodology

1.2.1 This FRA has been carried out in general accordance with the requirements of the National Planning Policy Framework (NPPF)[4]. The NPPF aims to prevent inappropriate development in areas at risk of flooding and to ensure that, where development is necessary in areas at risk of flooding, it is safe from flooding, does not increase flood risk elsewhere and reduces flood risk where possible.

1.2.2 The methodology, design criteria and data sources used in this FRA are set out in the main ES Environmental Impact Assessment Scope and Methodology Report (SMR)[5] and its Addendum[6].

[4] Department for Communities and Local Government (2018), *Revised National Planning Policy Framework*, https://www.gov.uk/government/collections/revised-national-planning-policy-framework

[5] HS2 Ltd (2017), *High Speed Two (HS2) Phase 2a (West Midlands - Crewe), Environmental Impact Assessment Scope and Methodology Report, Main ES, Volume 5: Appendix CT-001-001*, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/627187/E23_EIA_SMR_CT-001-001_WEB.pdf

[6] HS2 Ltd (2017), *High Speed Two (HS2) Phase 2a (West Midlands - Crewe), Environmental Impact Assessment Scope and Methodology Report Addendum, Main ES, Volume 5: Appendix CT-001-002*, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/627188/E24A_CT-001-002_Part_1_WEB.pdf and https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/627189/E24-B_CT-001-002_Part_B_WEB.pdf

2 Flood risk baseline

2.1.1 The flood risk baseline is set out in the main ES Volume 5, Appendix WR-003-002[7]. This information includes:

- relevant national, regional and local policy (Section 2);
- all communities and infrastructure assets currently at risk of flooding within the study area; and
- the Environment Agency's updated Flood Map for Surface Water (uFMfSW) data set has been used to determine the existing flood risk posed by surface water flooding to the AP2 amendments discussed in this flood risk assessment.

[7] HS2 Ltd (2017), *High Speed Two (HS2) Phase 2a (West Midlands - Crewe), Environmental Statement, Flood risk assessment, Volume 5: Appendix WR-003-001*, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/628276/E117_WR-003-002_WEB.pdf

3 AP2 amendments and flood risk implications

3.1.1 Table 1 shows the AP2 amendments in the Colwich to Yarlet area that have implications for flood risk.

Table 1: AP2 changes with implications for flood risk

AP2 Reference	Description	Implications
Change to Bill powers required for the diversion of a British Pipeline Agency fuel pipeline and a new utility compound, A51 Lichfield Road (AP2-002-007)	The placement of a construction compound within an area of potential surface water flooding.	The compound could be inundated during a flood event. Measures taken to safeguard the compound such as local land raising could cause peak flood levels to increase elsewhere.
Additional land and a change to Bill powers required for the realignment of the B5066 Sandon Road, diversion of Hopton Lane, extension of Hopton Lane and increased non-motorised user provision across the HS2 route between Hopton and Mount Edge (AP2-002-019)	The proposed realignment of Sandon Road and the introduction of two additional balancing ponds within an area of potential surface water flooding.	The proposed Sandon Road realignment and the proposed balancing ponds displace surface water accumulating within the existing topographical depression causing peak flood levels to increase elsewhere.

3.1.2 This FRA focuses on:

- understanding the potential flood risk issues associated with the temporary construction compound and identifying if any additional mitigation is required to manage these risks; and
- assessing the potential impacts of the realignment of Sandon Lane and the placement of the balancing ponds within the area of existing surface water flood risk and potential additional mitigation measures required.

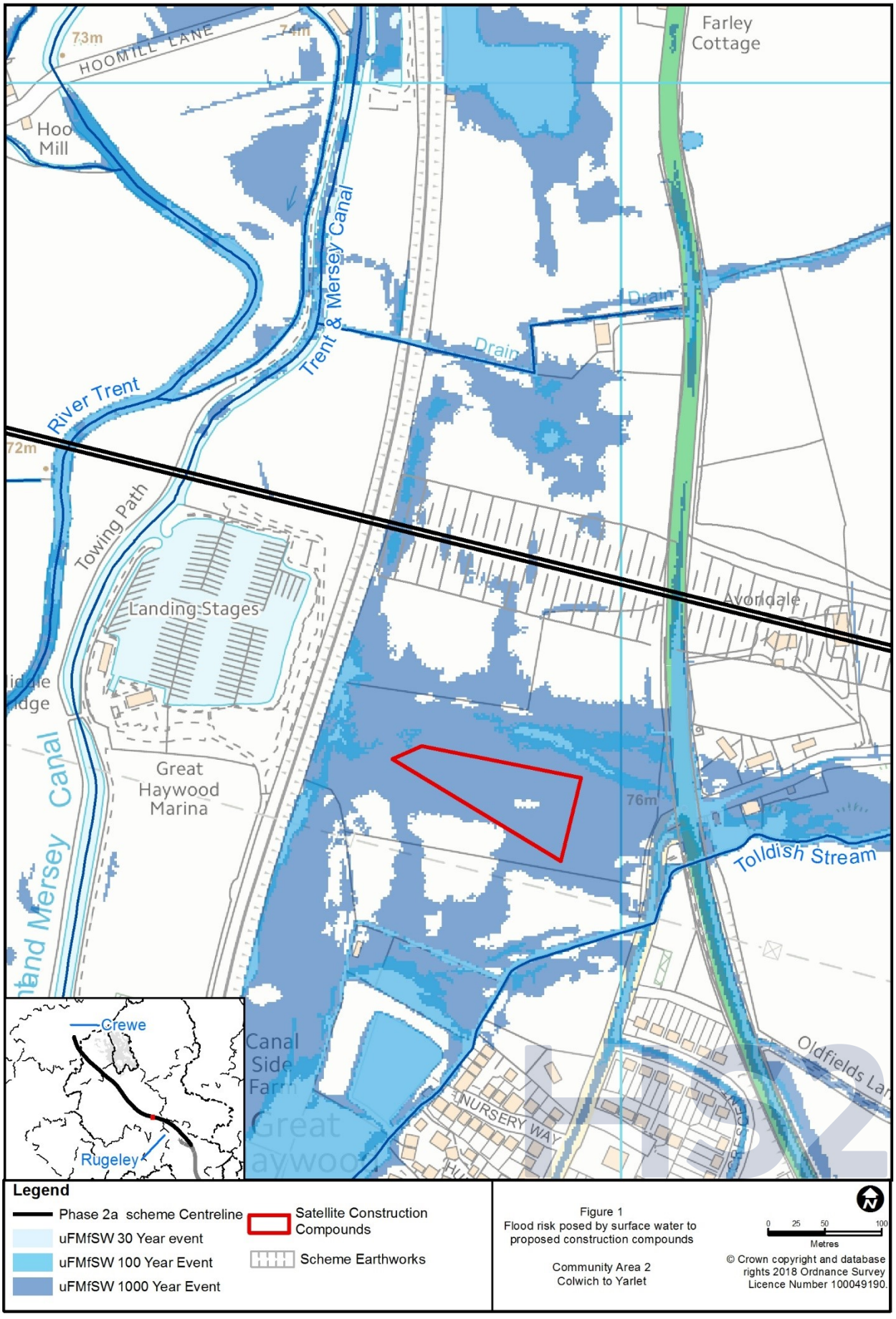
4 Flood risk assessment

4.1 Change to Bill powers required for the diversion of a British Pipeline Agency fuel pipeline and a new utility compound, A51 Lichfield Road (AP2-002-007)

4.1.1 Figure 1 shows that the proposed temporary construction compound is located with an area at risk of inundation from surface water based on the uFMfSW. Furthermore, it indicates that there is a 1 in 1,000 (0.1%) annual probability that the proposed temporary compound could flood to a maximum depth of 300mm.

4.1.2 If flooding did occur, the compound would be at direct risk and its presence may make flooding worse for others. If the entire footprint of the compound were to be raised, it is conservatively estimated that this has potential to cause an increase in local flood levels that could exceed 50mm, which is a moderate adverse impact. The areas that would be affected comprise agricultural land, which is of moderate value, meaning that the effects would be moderate adverse, which is significant.

Figure 1: Surface water flood risk to the proposed temporary construction compound

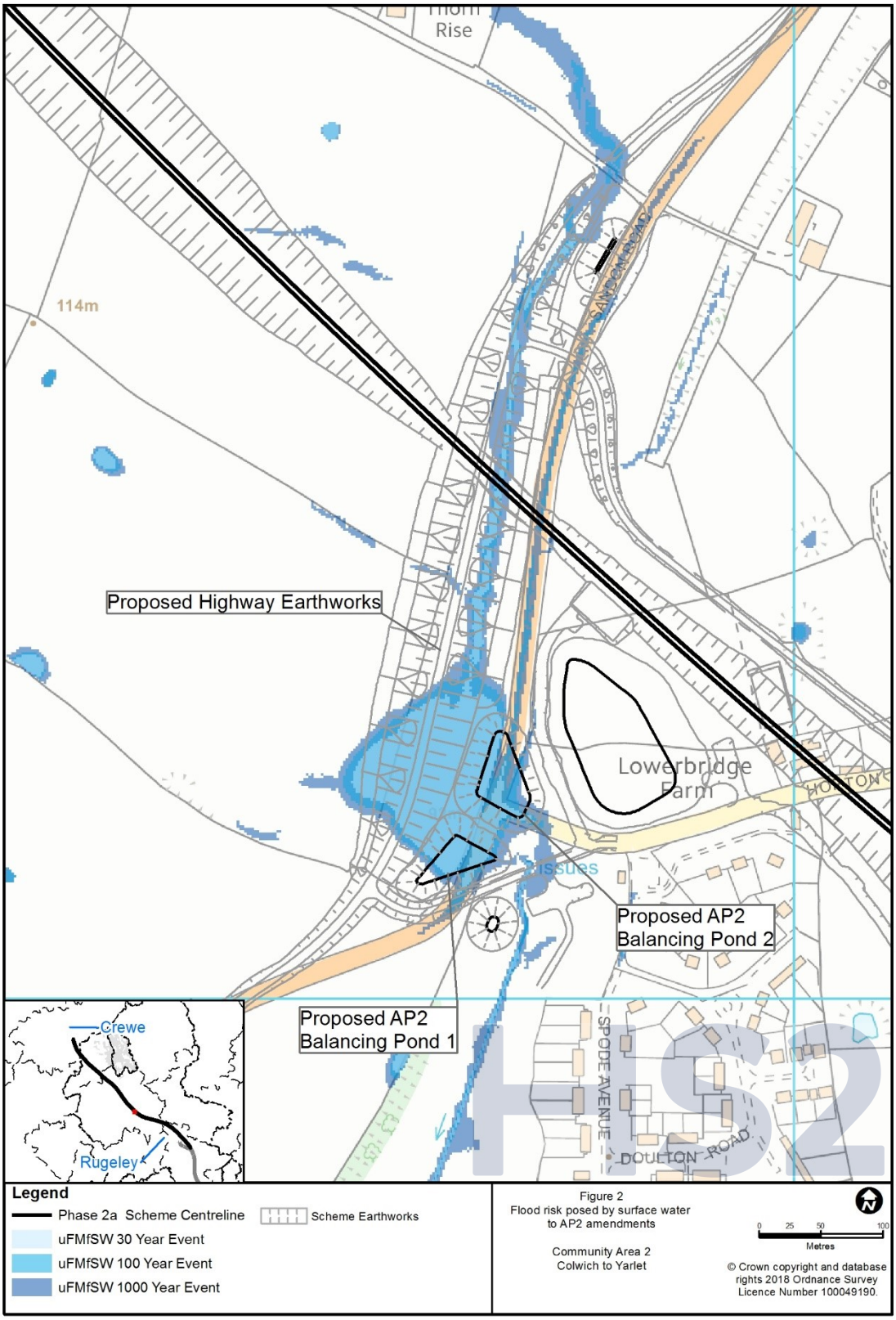


4.2 Additional land and a change to Bill powers required for the realignment of the B5066 Sandon Road, diversion of Hopton Lane, extension of Hopton Lane and increased non-motorised user provision across the HS2 route between Hopton and Mount Edge (AP2-002-019)

4.2.1 The Sandon Road realignment and proposed balancing ponds are located within an area indicated to be at risk of surface water flooding, based on the Environment Agency's uFMfSW, as shown in Figure 2.

4.2.2 This amendment will therefore displace surface water that would naturally be attenuated within this localised depression before discharging into the tributary of the Kingston Brook. The access roads to the balancing ponds also have the potential to impede existing surface water flow paths and displace surface water stored in this area. This displacement of surface water ponding and changes to the surface water flow path has the potential to increase flood risk downstream by over 50mm, which is a moderate adverse impact. It would affect moderate value agricultural land and this would therefore result in a new permanent moderate adverse effect, which is significant.

Figure 2: Surface water flood risk in the vicinity of the AP2 amendment



5 Flood risk management measures

5.1 Introduction

5.1.1 The overall approach to flood risk mitigation taken on the AP2 revised scheme is set out in the main ES Volume 5, Appendix WR-003-002. The need for additional measures arising from the AP2 revised scheme is considered below.

5.2 Change to Bill powers required for the diversion of a British Pipeline Agency fuel pipeline and a new utility compound, A51 Lichfield Road (AP2-002-007)

5.2.1 The compound will be designed and configured in a manner that takes the risk of flooding into consideration. Specific measures would include:

- ensuring welfare facilities, site offices space and any storage areas for flood sensitive apparatus or materials are located on the highest ground;
- ensuring that the compound has a flood plan, including a link to the Environment Agency's flood warning service, that safe access/egress is established along any haul roads and that the roads do not impede flood flow or reduce flood storage capacity;
- reducing the extent to which ground levels are raised above their existing level; and
- retaining routes for floodwater through the site that are compatible with shallow flooding and which would not result in scour or pollution-generation.

5.2.2 Other flood risk issues would be managed through application of the measures and procedures outlined in the draft Code of Construction Practice (CoCP)[8].

5.3 Additional land and a change to Bill powers required for the realignment of the B5066 Sandon Road, diversion of Hopton Lane, extension of Hopton Lane and increased non-motorised user provision across the HS2 route between Hopton and Mount Edge (AP2-002-019)

5.3.1 The detailed design of the surface water management infrastructure, including access roads, will involve refinement to create a balancing feature that is able to control and enhance, rather than displace, the floodwater that would naturally pond in this location. This will prevent increases in downstream flood risk.

5.3.2 The design refinement will be undertaken in consultation with the Environment Agency and Staffordshire County Council, acting as the Lead Local Flood Authority. If any residual effects are identified, which will not be significant, the affected

[8] HS2 Ltd (2017), *High Speed Two (HS2) Phase 2a (West Midlands - Crewe), Draft Code of Construction Practice, Volume 5: Appendix CT-003-000* https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/627182/E26_CT-003-000_WEB.pdf

landowners would also be consulted. The aim will be to avoid unacceptable increases in flood risk.

5.3.3 The long term maintenance of these facilities will be undertaken by an appropriate body as identified by the asset owner. This will include the provision of appropriate access arrangements.

6 Conclusions

6.1.1 The proposed temporary construction compound located within a surface water flow path has the potential to change local surface water flood levels and inundation extents if land raising is required to operate the site. This has the potential to result in a new significant effect related to flood risk. Design and configuration measures have been derived that, in association with the draft CoCP will reduce the impact of the compound on local flood risk as far as is reasonably practical and make the compound safe to operate.

6.1.2 The proposed realignment of Sandon Road and the location of the two balancing ponds, within an area of existing surface water flood risk, has the potential to result in a new significant effect related to flood risk. Detailed design will involve refinement to create a surface water management system that controls rather than displaces the floodwater that would naturally pond in this location.

6.1.3 Detailed design will be undertaken in consultation with the Environment Agency and Staffordshire County Council acting as the Lead Local Flood Authority.

6.1.4 If any residual effects are identified, the affected landowners will also be consulted. The aim will be to ensure that no parties are affected by unacceptable increases in flood risk.

6.1.5 It is currently anticipated that it will be possible to mitigate the impacts identified such that the AP2 revised scheme will not result in significant adverse effects related to flood risk.

7 References

Department for Communities and Local Government (2012), *National Planning Policy Framework*. Available online at: https://www.gov.uk/guidance/national-planning-policy-framework.

HS2 Ltd (2017), *High Speed Two (HS2) Phase 2a (West Midlands - Crewe), Environmental Statement*. Available online at: https://www.gov.uk/government/collections/hs2-phase-2a-environmental-statement.

HS2 Ltd (2017), *High Speed Two (HS2) Phase 2a (West Midlands - Crewe), Environmental Statement, Flood risk assessment, Volume 5: Appendix WR-003-002*. Available online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/628276/E117_WR-003-002_WEB.pdf.

HS2 Ltd (2017), *High Speed Two (HS2) Phase 2a (West Midlands - Crewe), Flood risk assessment, Volume 5: Appendix WR-003-003*. Available online at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/628409/E136_WR-003-003_WEB.pdf.

HS2 Ltd (2018), *High Speed Two (HS2) Phase 2a (West Midlands - Crewe), Background Information and Data to accompany the Supplementary Environmental Statement and Additional Provision Environmental Statement, Hydraulic modelling report - Filly Brook*. Available online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/692671/G36_Hydraulic_modelling__BID-WR-004-000__WEB.pdf.

HS2 Ltd (2017), *High Speed Two (HS2) Phase 2a (West Midlands - Crewe), Environmental Impact Assessment Scope and Methodology Report*, Main ES, *Volume 5: Appendix CT-001-001.* Available online at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/627187/E23_EIA_SMR_CT-001-001_WEB.pdf.

HS2 Ltd (2017), *High Speed Two (HS2) Phase 2a (West Midlands - Crewe), Environmental Impact Assessment Scope and Methodology Report Addendum, Main ES, Volume 5: Appendix CT-001-002.* Available online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/627188/E24A_CT-001-002_Part_1_WEB.pdf and https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/627189/E24-B_CT-001-002_Part_B_WEB.pdf.

HS2 Ltd (2017), *High Speed Two (HS2) Phase 2a (West Midlands - Crewe), Draft Code of Construction Practice, Volume 5: Appendix CT-003-000*. Available online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/627182/E26_CT-003-000_WEB.pdf.

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