

Chapter 10: Effect Interactions

INTRODUCTION

- 10.1 This chapter of the ES summarises the likelihood for in-combination effects or ‘effect interactions’. Effect interactions occur because of interactions between multiple individual effects associated with just one project on a receptor i.e. the combination of individual effects, for example effects in relation to noise, dust and traffic on a receptor.
- 10.2 Effects arising from the Proposed Development in combination with other developments or ‘cumulative schemes’ have been discussed separately throughout this ES (in **ES Volume 1: Chapters 6 to 9** and **ES Volume 2**), as appropriate, and have not been re-iterated within this ES chapter to avoid repetition.
- 10.3 There is no established EIA methodology for assessing the nature and scale of effect interactions on a receptor. However, the European Commission¹ (EC) has produced guidelines to assist EIA practitioners in developing an approach which is appropriate to a project. These guidelines have been used to develop an approach which uses the defined residual effects of the Proposed Development (as presented throughout this ES (in **ES Volume 1, Chapters 6 to 9** and **ES Volume 2**) to determine the potential for effect interactions. These residual effects are reliant on mitigation measures (as identified throughout this ES and presented in **ES Volume 1, Chapter 12: Environmental Management, Mitigation and Monitoring Schedule**); the mitigation measures have been assumed to be secured / implemented through the discharge of relevant planning conditions or Section 106 Obligations.
- 10.4 The approach to defining effect interactions involves tabulating the residual effects of the Proposed Development against receptors or, where more appropriate, receptor groups to identify the potential for in-combination effects or effect interactions. For the purposes of this assessment, residual effects that have been identified in **ES Volume 1, Chapters 6 to 9** and in **ES Volume 2** that do not affect a common sensitive receptor have not been presented in this ES chapter, as no effect interactions are anticipated. Only residual effects that are likely to give rise to effect interactions have been considered and discussed as relevant.
- 10.5 Based on the definitions of what ‘Negligible’² effects comprise for each of the technical assessments as presented in this ES, these do not warrant further consideration in relation to in-combination effects and have therefore not been pulled through into the assessment of effect interactions. Only effects described as ‘Minor’ and above in scale are therefore considered.
- 10.6 The potential for in-combination effects is identified, and professional judgement is then used to determine if the potential in-combination effects could lead to an effect interaction. Where a resultant effect interaction is identified, this is further discussed qualitatively.
- 10.7 The scale of an effect interaction is not assigned as part of this assessment; however, whether the effect interaction is a likely significant effect has been identified³. For example, when one or more residual significant effects (i.e. effects that are typically ‘Moderate’ or ‘Major’ in scale) from different EIA topics (i.e. noise and vibration) coincide on a receptor, the effect interaction is deemed ‘significant’. If none of the individual effects are significant, consideration is given as to whether the combination of many ‘not significant’ effects could result in a combined significant effect, based on professional judgement.
- 10.8 Where the nature of effects that interact are the same (i.e. they are all either adverse or beneficial), the nature of the effect interaction is reported upon. Where multiple effects of differing natures interact (i.e. there is a combination of both beneficial and adverse effects), the nature of any significant effect interaction identified has not been assigned.

¹ European Community (1999); Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions.
² Based on the broad definitions for scale of effect set out in Table 2.3 of **ES Volume 1, Chapter 2: EIA Methodology**, Negligible effects are “Effects which are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error, these effects are unlikely to influence decision making, irrespective of other effects.”

- 10.9 It should be noted that, for most technical topics, residual effects that are identified as ‘Moderate’ or ‘Major’ are considered to be significant (with effects that are ‘Negligible’ or ‘Minor’ in scale being not significant). The technical assessments which follow differing criteria to define significance are re-summarised below:
- For the Wind Microclimate assessment within **ES Volume 1, Chapters 8: Wind Microclimate**, all adverse effects are categorised as significant, while negligible or beneficial effects will have suitable conditions so are considered ‘not significant’.
- 10.10 Additionally, whilst the identification of significance within **ES Volume 2: Townscape and Visual Impact Assessment** generally follows the approach set out in paragraph 10.9, it is noted that when determining whether an effect is significant or not an element of professional judgement has been applied regarding the nature of the effect.
- 10.11 Residual effects that are ‘Minor’, ‘Moderate’ or ‘Major’ in scale have been considered. Within the tables presented throughout this ES chapter, adverse effects are shaded in ‘orange’, beneficial effects are shaded in ‘green’ and neutral effects are shaded in ‘blue’ for ease of identification.
- 10.12 This ES chapter has subsequently been divided into two parts:
- Enabling and Construction Works – which addresses potential in combination effects and effect interactions arising from the enabling and construction works; and
 - Completed Development – which addresses potential in combination effects and effect interactions arising from the completed and operational Proposed Development.
- 10.13 Consideration has also been given to the indicative phasing presented in **ES Volume 1, Chapter 5: Enabling and Construction Works** where relevant (e.g. Socio-Economics). The effect interactions assessment presented in this ES chapter incorporates the conclusions of each of the technical assessments with due consideration of phasing with regards to when effects have the potential to interact.

ENABLING AND CONSTRUCTION WORKS

- 10.14 Table 10.1 presents the in-combination effects assessment associated with the enabling and construction works of the Proposed Development and identifies the potential for effect interactions. Where the potential for an effect interaction is identified, this is discussed in more detail below the table.

Table 10.1 Effect Interactions – Enabling and Construction Works

Receptor	Technical Topic Area and Residual Effect	Scale and Nature Of Residual Effect	Significance of Individual Effect
Rosa Luxemburg Apartments	Noise and Vibration Substructure construction noise	Moderate Adverse	Significant
	Noise and Vibration Superstructure construction noise	Moderate Adverse	Significant
	Noise and Vibration Construction vibration	Moderate Adverse	Significant
West Apartments	Noise and Vibration Substructure construction noise	Moderate Adverse	Significant

³ The methodology for determining a significant in-combination effect has been defined by the HS2 Phase 2a: West Midlands – Crewe Scoping and Methodology Report (July 2017) and the published HS2 Phase 2a Environmental Statement Volume 1 Introduction and Methodology and Volume 2 Community Area Reports (July 2017). The methodology for assigning significance to in combination effects has been specifically included in this ES to assess if there are any combination effects would result in a significant effect.

Receptor	Technical Topic Area and Residual Effect	Scale and Nature Of Residual Effect	Significance of Individual Effect
	Noise and Vibration Superstructure construction noise	Moderate Adverse	Significant
	Noise and Vibration Construction vibration	Moderate Adverse	Significant
1-9 and 19-21 Hale Road (odds)	Noise and Vibration Substructure construction noise	Moderate Adverse	Significant
	Noise and Vibration Superstructure construction noise	Moderate Adverse	Significant
	Noise and Vibration Construction vibration	Moderate Adverse	Significant
NLSSM The School of Sports Massage	Noise and Vibration Substructure construction noise	Minor Adverse	Not Significant
	Noise and Vibration Superstructure construction noise	Minor Adverse	Not Significant

10.15 Table 10.1 shows that effect interactions have been identified in respect of the worst-case construction noise and vibration during the enabling and construction works. A discussion of these interactions is provided below:

- Due to the significance of the residual effects in isolation, **significant adverse** effect interactions have been identified at the Rosa Luxemburg Apartments, the West Apartments and 1-9 and 19-21 Hale Road (odds); and
- A not significant effect interaction has been identified at NLSSM The School of Sports Massage. The effect interaction is deemed 'not significant' as none of the individual effects being considered is significant in isolation.

10.16 The effects from both noise and vibration are considered to be worst-case effects, given the worst-case assumptions made about closeness to the sensitive receptors made within the ES chapter (i.e. for piling activities, a worst case distance of less than 20m has been assumed). Furthermore, these effect interactions will be experienced in the short term and would be temporary in nature as it is associated with the construction works, and noise and vibration effects would only be experienced during specific enabling and construction activities, which would not be undertaken on a continuous basis for the duration of the works.

10.17 The individual effects will be managed through site-specific management plans and strategies, which would be secured through the Construction Environmental Management Plan (CEMP) and include management and mitigation measures covering Best Practicable Means (BPM) relating to noise and vibration, including properly maintaining and operating plant in accordance with manufacturer's recommendations. A 'Piling Method Statement' (PMS) will also be provided and agreed prior to the commencement of enabling and construction works.

10.18 An outline CEMP (OCEMP) has been produced as a standalone report and submitted to accompany the planning application. The measures within the OCEMP have also been summarised in **ES Volume 1, Chapter 12: Environmental Management, Mitigation and Monitoring Schedule**.

10.19 It is noted that the effect interactions (and whether these interactions are considered to be significant) set out above, take into account the implementation of the mitigation / management measures stated in paragraph 10.17.

Hale Road Properties – 11, 13, 15 & 17 Hale Road

10.20 A separate noise and vibration assessment has been provided within **ES Volume 3, Appendix: Noise and Vibration – Annex 5** to a discrete number of properties (11, 13, 15 and 17 Hale Road) which are currently vacant and unoccupied in the existing baseline condition along Hale Road (to the south of the site). Whilst these properties are not currently occupied by sensitive receptors, it is noted that there is no certainty that these properties won't become occupied in the future if aspirational development plans do not come forward. In this scenario, based on the results presented in **ES Volume 3, Appendix: Noise and Vibration – Annex 5** there would be effect interactions at 11, 13, 15 and 17 Hale Road in relation to substructure construction noise, superstructure construction noise and construction vibration. As all of these residual effects are Moderate Adverse (and therefore **significant**). Due to their significance in isolation these, **significant adverse** effect interactions have been identified at each of these properties. This reflects the results of the other Hale Road properties (1-9 and 19-21 (odds)).

10.21 It is considered that paragraphs 10.16 to 10.18 are also relevant for 11, 13, 15 and 17 Hale Road.

COMPLETED DEVELOPMENT

10.22 Table 10.2 presents the in-combination effects assessment associated with the completed and operational Proposed Development and identifies the potential for effect interactions. Where the potential for an effect interaction is identified, this is discussed in more detail below.

Table 10.2 Effects Interactions – Completed Development

Receptor	Technical Topic Area and Residual Effect	Scale and Nature Of Residual Effect	Significance of Individual Effect
Sessile Apartments	Daylight Reduction to daylight within neighbouring properties	Minor Adverse	Not Significant
	Sunlight Reduction to sunlight within neighbouring properties	Minor Adverse	Not Significant
East Apartments	Daylight Reduction to daylight within neighbouring properties	Minor Adverse	Not Significant
	Sunlight Reduction to sunlight within neighbouring properties	Minor Adverse	Not Significant
Rosa Luxemburg Apartments	Daylight Reduction to daylight within neighbouring properties	Major Adverse	Significant
	Sunlight Reduction to sunlight within neighbouring properties	Moderate Adverse	Significant

10.23 Table 10.2 shows that effect interactions have been identified in respect of daylight and sunlight levels at the residential receptors in proximity of the site. A discussion of these interactions is provided below:

- Due to the significance of the residual effects in isolation, a **significant adverse** effect interaction has been identified at the Rosa Luxemburg Apartments; and
- Not significant effect interactions have been identified at the Sessile Apartments and East Apartments. The effect interaction is deemed 'not significant' as none of the individual effects being considered is significant in isolation.

10.24 It is acknowledged that whilst significant effects still occur to some receptors, this is as a result of the daylight and sunlight assessments making a comparison between the existing vacant site and the Proposed

Development. The site is allocated for development as part of a wider opportunity area within the LBH, and as such the surrounding area has been subject to significant regeneration, which has locally increased the density and associated building heights within the area.

10.25 The design process has also sought to maximise the availability of daylight and sunlight to existing receptors whilst optimising the conditions on-site, and therefore any further mitigation is not considered necessary. The design evolution of the Proposed Development with regards to daylight and sunlight effects on existing receptors is considered and summarised within **ES Volume 1, Chapter 3: Alternatives and Design Evolution**.

Hale Road Properties – 11, 13, 15 & 17 Hale Road

10.26 Similarly to noise and vibration, a separate daylight and sunlight assessment has been provided within **ES Volume 3, Appendix: Daylight, Sunlight, Overshadowing and Solar Glare – Annex 11** to a discrete number of properties which are currently vacant and unoccupied in the existing baseline condition along Hale Road (to the south of the site). Whilst these properties are not currently occupied by sensitive receptors, it is noted that there is no certainty that these properties won't become occupied in the future if aspirational development plans do not come forward. In this scenario, based on the results presented in **ES Volume 3, Appendix: Daylight, Sunlight, Overshadowing and Solar Glare – Annex 11**, there would be no effect interactions at either 11, 13, 15 or 17 Hale Road in relation to a reduction in daylight and sunlight amenity.

SUMMARY

10.27 In summary, the following significant effect interactions have been identified from the Proposed Development during enabling and construction works:

- Temporary **significant** (Adverse) effect interactions on the Rosa Luxemburg Apartments, West Apartments and 1-21 Hale Road (odds), due to the combined effects of construction noise and construction vibration.

10.28 The following significant effect interaction has been identified once the Proposed Development is complete and operational:

- A **significant** (Adverse) effect interaction on the Rosa Luxemburg Apartments, due to the combined effects of a reduction in daylight and sunlight associated with the Proposed Development.