

Chapter 11: Effect Interactions

INTRODUCTION

- 11.1
- This chapter of the Environmental Statement (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. Note that 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 6-10* and *ES Volume 2 Townscape, Built Heritage and Visual Impact Assessment*), as appropriate, and have not been re-iterated within this ES chapter to avoid repetition.
- 11.2
- There is no established EIA methodology for assessing the nature and scale of effect interactions on a receptor. However, the European Commission (EC) ¹ 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 6-19* and *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 full in *ES Volume 1, Chapter 13: Mitigation and Monitoring Schedule*); the mitigation measures have been assumed to be secured / implemented through the discharge of relevant planning conditions and Section 106 Obligations.
- 11.3
- 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. Residual effects that are beneficial or adverse or neutral in nature and that are minor, moderate or major in scale have been considered. Residual effects that are negligible in scale have been omitted, as these effects are, by definition, unnoticeable and insignificant. It is not considered that there would be a scenario where multiple negligible effects could lead to significant effect interactions. The effects highlighted in green within the tables presented in this chapter reflect beneficial effects, those in blue, neutral effects and those in orange, adverse effects.
- 11.4
- The potential for in-combination effects is identified, and professional judgement is 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.
- 11.5
- The scale of an effect interaction is not assigned as part of this assessment; however, whether the effect interaction is considered to be significant or not is identified. For example, when one or more residual significant effect from different EIA topics (i.e. air quality, noise and vibration, highways and transport or visual) coincide on a receptor or receptor group, the effect interaction has been identified as significant.
- 11.6
- In-combination effects or effect interactions arising from the demolition and construction works, and the completed and operational Proposed Development are discussed in the following sections of this ES chapter.

DEMOLITION AND CONSTRUCTION

- 11.7
- Table 11.1 presents the in-combination effects assessment and identifies the potential for effect interactions throughout the demolition and construction works.
- 11.8
- Where the potential for an effect interaction is identified, this is discussed in more detail below.

Table 11.1 Potential for Effects Interactions – Demolition and Construction

Receptor	Residual Effect	Scale and Nature Geographic Extent	Potential for Intra-Project Cumulative Effects / Effect Interactions
Residential Occupiers / Residential Amenity	Noise: Construction activity noise on local residential dwellings and new residents within Building A of the Proposed Development	Minor Adverse Local	No All effects relate to Noise and Vibration
	Noise: Construction traffic noise on local residential dwellings Vibration: Construction activity vibration resulting from demolition and construction works on local residential dwellings	Minor Adverse Local Minor Adverse Local	
Employment	Socio-Economics: Temporary Construction Employment	Minor Beneficial Regional	No All effects relate to Socio-Economics
	Socio-Economics: Loss of Existing Employment	Minor Adverse Local	

- 11.9
- Table 11.1 shows that there is the potential for an in-combination effect / effect interaction on neighbouring residential occupiers, in particular, to residential amenity relating to:

 - Demolition and construction works noise;
 - Demolition and construction HGV noise; and
 - Demolition and construction vibration.
- 11.10
- The geographic extent of the effect interactions are local and limited to a small number of residential dwellings surrounding the site (St Mary’s Butts and Oxford Road).
- 11.11
- It is not uncommon for construction works to be undertaken in close proximity to residential uses and the potential for temporary or short-term adverse effects on local residences and residential amenity is expected. This is an inevitable consequence of living within an urban environment, particularly within an area undergoing regeneration in accordance with a local development plan.
- 11.12
- The planning process provides a mechanism through the stipulation of planning conditions to control the potential for adverse residential amenity or ‘nuisance’ effects during demolition and construction works. Planning conditions typically require detailed construction plans and procedures to be agreed with the local authority prior to the start of works on a site relating to for example, the control of noise, dust/air quality, road traffic and vibration. In addition, specific requirements tend to be set regarding public relations and community engagement for large construction projects and mechanisms for receiving, handling and responding to any complaints. As a result, impacts and resultant nuisance effects, including to residential amenity, tend to be managed as far as is reasonably practicable through planning conditions and obligations on contractors, however it is recognised that adverse nuisance effects could still arise.
- 11.13
- A number of measures to mitigate noise and vibration from the demolition and construction shall be implemented. The measures shall constitute ‘Best Practicable Means’; the specific measures shall be defined throughout the detailed demolition and construction works programming and will all be incorporated into a Construction Environmental Management Plan (CEMP). The measures include but are not limited to:

 - Fully encapsulating the existing building with a sheeted scaffold;
 - All machines in intermittent use shall be shut down in the intervening periods between works if possible, or throttled down to a minimum;

¹ European Community (1999); Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions.

- Stationary noise sources will be situated as far as possible from noise-sensitive receptors; and
- The use of Continuous Flight Auger piling over more noisily piling methods.

11.14 Based on the scale of the noise and vibration effects defined (all Minor Adverse and not significant), significant in-combination effects on residential amenity are not anticipated.

COMPLETED DEVELOPMENT

11.15 Table 11.2 presents the in-combination effects assessment and identifies the potential for effect interactions on completion and occupation of the Proposed Development.

11.16 Where the potential for an effect interaction is identified, this is discussed in more detail below.

Table 11.2 Potential for Effect Interactions – Completed Development

Receptor	Residual Effect	Scale and Nature Geographic Extent	Potential for Intra- Project Cumulative Effects / Effect Interactions
Pedestrians and Cyclists	Wind Microclimate: wind conditions (during the summer season) in Amenity Spaces (Probe Locations 74, 110, 112, 114, 102, 104, 105, 106).	Moderate Adverse Local	No All effects relate to Wind Microclimate.
	Wind Microclimate: wind conditions (during summer season) in Amenity Spaces (Probe Locations 64, 122, 120, 118, 103, 107, 108, 109, 111, 113, 115, 116)	Minor Adverse Local	
	Wind Microclimate: wind conditions (during the windiest season) in thoroughfares (Probe Locations 6).	Minor Adverse Local	
	Wind Microclimate: wind conditions (during the windiest season) in entrances (Probe Locations 7 and 67).	Minor Adverse Local	
	Wind Microclimate: wind conditions (during the windiest season) at roadways (Probe Locations: 40).	Major Adverse Local	
	Wind Microclimate: wind conditions (during the windiest season) at roadways (Probe Locations: 48).	Moderate Adverse Local	
Local Economy	Socio-Economics: Increase in the population and labour market of the borough	Minor Beneficial Borough	No All effects relate to Socio-Economics.
	Socio-Economics: Increase in the population and labour market of the borough	Moderate Beneficial Local	
	Socio-Economics: Increased household expenditure in the borough	Minor Beneficial Borough	
	Socio-Economics: Increase in the local housing supply	Moderate Beneficial Local	
	Socio-Economics: Increase in the local housing supply	Minor Beneficial Borough	

Residential Occupiers - Amenity	Noise: Building services noise on local residential dwellings	Minor Adverse Local	Yes Effects between increased noise levels and reduced daylight and sunlight have the potential to interact
	Noise: Change in operational road traffic noise on local residential dwellings	Minor Adverse Local	
	Daylight: to neighbouring residential receptors (Locations: 61, 62, 58, 21, 22, 23 St Mary's Butts and 15 Queens Walk)	Minor Adverse Local	
	Daylight: to neighbouring residential receptors (Location 19, 20, 59, 60 St Mary Butts and McIlroys Building)	Minor to Moderate Adverse Local	
	Sunlight: to neighbouring residential receptors (Location – 21, 22, 23, 32, 35, 36, 37 St Mary's Butts, 15 Queens Walk, and McIlroys Building)	Minor Adverse Local	
	Sunlight: to neighbouring residential receptors (Location - 38 Oxford Road, 19 – 20 St Marys Butts)	Moderate Adverse Local	
Amenity spaces	Sunlight: to neighbouring residential receptors: (Location 61 and 62 St Marys Butts)	Negligible to Minor Adverse Local	Yes Effects relating to the new provision of amenity spaces, overshadowing and wind microclimate
	Overshadowing: to surrounding amenity areas (Sun hours on the ground and Transient Overshadowing)	Minor Adverse Local	
	Wind Microclimate: wind conditions (during the summer season) in Amenity Spaces (Probe Locations 74, 110, 112, 114, 102, 104, 105, 106).	Moderate Adverse Local	
	Wind Microclimate: wind conditions (during summer season) in Amenity Spaces (Probe Locations 64, 122, 120, 118, 103, 107, 108, 109, 111, 113, 115, 116)	Minor Adverse Local	
	Socio-Economics: Introduction of new communal amenity space in the centre of Reading	Minor Beneficial Borough	
Views and Townscape	Townscape, Built Heritage and Visual Impact Assessment to be completed		
Global Climate	Climate Change	Significant Adverse Global	No All effects relate to Climate Change

Residential Occupiers / Residential Amenity

11.17 Table 11.2 shows that there is the potential for interactions between the effects relating to noise and vibration, daylight and sunlight on surrounding residential properties. The properties affected are located along Queen's Walk, St Mary's Butts and Oxford Road. These effects could combine / interact to adversely affect residential amenity. The most significant effects relate to daylight (Minor-Moderate Adverse) and sunlight (Moderate Adverse). On the basis of significant effects, the in-combination effect / effect interaction between daylight, sunlight and noise is assessed as being significant.

- 11.18** These adverse effects being largely inevitable with the redevelopment of the site in an area where redevelopment is supported by Reading's aspirations for the area. Due to this being subjective however, it is not considered appropriate to state whether this possible effect interaction is significant or not.

Amenity Spaces

- 11.19** Future on-site residents will benefit from the use of existing open space and incidental play space provision within the newly created amenity space provided at the podium level and within the roof terraces on Buildings A to C. In addition, future on-site residents and visitors to the site shall benefit from the proposed public realm improvements both within the site and the wider surrounding area. The new spaces will provide opportunities to stroll/walk, congregate, play and relax.
- 11.20** The benefit provided through the provision of new amenity spaces and public realm however has the potential to be tempered by the temporary effect of overshadowing across the wider area at certain times of the day/year.
- 11.21** Whilst significant wind microclimate effects have been identified, the Applicant is committed to undertaking further wind tunnel assessment to refine the mitigation strategy proposed to render any significant adverse effect insignificant.
- 11.22** On this basis, the in-combination effect / effect interaction to amenity spaces as a result of wind microclimate, overshadowing and socio-economics is not assessed as being significant.

SUMMARY AND CONCLUSION

- 11.23** The assessment has demonstrated that there is the potential for effect interactions to take place during the demolition and construction of the Proposed Development to Residential Occupiers / Residential Amenity within proximity to the site. The in-combination effects relate to noise and vibration. However, based on the scale of the noise and vibration effects defined, significant in-combination effects on residential amenity are not anticipated.
- 11.24** On completion and occupation of the Proposed Development, there is the potential for significant adverse effect interactions to Residential Occupiers / Residential Amenity, specifically along Queen's Walk, St Marys Butts and Oxford Road, as a result of in-combination effects associated with noise from surrounding road traffic and building services plant and changes in daylight and sunlight amenity. On the basis of the significant daylight and sunlight effects, the in-combination effect / effect interaction between daylight, sunlight and noise is assessed as being significant.