

13 Summary of Mitigation, Residual and Interaction Effects

13.1 Introduction

- 13.1.1 This chapter (alongside its appendices) provides a summary of the proposed mitigation and the residual effects predicted following their implementation. It should be read in conjunction with Appendix 13.1 - Summary of Effects and Appendix 13.2 - Summary of Mitigation Measures. This chapter does not provide a full summary of the ES. A Non-Technical Summary is provided separately.
- 13.1.2 The summary of proposed mitigation measures is provided to assist the planning authority in formulating the conditions and clauses of the legal agreement, to ensure that the measures contained and assessed in this ES are implemented.
- 13.1.3 A summary of the identified effects is tabulated within Appendix 13.1. A summary of proposed mitigation measures is set out in Appendix 13.2. These measures demonstrate the applicants' intention to commit to the implementation of all necessary mitigation measures in agreement with the Local Planning Authority.

13.2 Additional Mitigation and Residual Effects

Air Quality

Construction Phase

- 13.2.1 With the embedded construction phase mitigation measures detailed in the Construction and Environmental Management Plan (CEMP), the effect of demolition and construction dust emission impacts on air quality is assessed as not significant. As such, no additional mitigation is required to reduce the direct effects of the Proposed Development demolition and construction activities.
- 13.2.2 With appropriate inherent mitigation in place the residual effect of demolition and construction effects remain as reported, temporary, **negligible adverse** impacts which result in **not significant** effects.

Operation Phase

- 13.2.3 The effects of development traffic on local air quality based on the conservative assessment undertaken are judged to be not significant. No additional traffic mitigation is therefore required to reduce the direct effects of the Proposed Development on local air quality.
- 13.2.4 However, the Applicant and the design team have developed a number of design measures which will further ensure that the potential for adverse effects are avoided.
- 13.2.5 No additional mitigation is required in respect of the operation of the Proposed Development and the operational effects remain as reported at existing receptors, which are of a direct and permanent **negligible adverse** impact on air quality, but which is overall considered to be **not significant**.

- 13.2.6 Air quality objectives are expected to be met at future sensitive receptors during the operation of the Proposed Development and therefore result in a direct and permanent **negligible adverse** impacts which result in **not significant** effects.

Climate Change & Greenhouse Gases

Construction Phase

- 13.2.7 During the construction phase, the embodied carbon within timber frame construction, and construction traffic and worker travel is expected to have a minor adverse effect, which is not significant in terms of EIA. However, heat stress during extreme temperatures on construction workers would have a moderate level of effect prior to additional mitigation, which is significant. Additional mitigation in the form of CEMP protocols would reduce the effect to **minor adverse**, which would be **not significant** in terms of EIA.

Operation Phase

- 13.2.8 During the operational phase, overheating in future summers would have a major effect on building occupants without additional mitigation. This is significant in terms of EIA. Additional mitigation through the Approved Document O (2021) for Overheating standards and passive design would reduce the residual effect to minor, which is not significant in terms of EIA.
- 13.2.9 Surface water flooding would have a moderate level of effect on both occupants and property. Additional mitigation in the form of SuDS features which will be designed with climate allowed will ensure the level of effect is reduced to **minor adverse**, which is **not significant** in terms of EIA.

Ecology

Construction Phase

- 13.2.10 The ecology chapter has identified that the Proposed Development will result in minor adverse effects during the construction phase if invasive species are not removed in accordance with species-specific methodology, which are not significant.
- 13.2.11 Key additional mitigation measures during the construction phase include the production of a detailed CEMP, which would outline mitigation relating to woodland, hedgerows, ponds and invasive species, and badger, bats, birds, reptiles and great crested newt. The CEMP would be secured via an appropriately worded planning condition.
- 13.2.12 Following the implementation, residual effects will be reduced to **negligible**, and **not significant**.

Operational Phase

- 13.2.13 Likely significant effects arising during the operational phase include the long-term effects of increased recreational visitor pressure on the Thames Basin Heath SPA/Longmoor Bog SSSI, permanent direct damage to woodland, hedgerows and ponds, invasive species, and permanent direct habitat loss/fragmentation on nesting birds.
- 13.2.14 Key additional mitigation during the operational phase includes a commitment towards SANGS which will be secured via a S106, the retention and enhancement of the woodland, the removal of invasive species, the production of a Habitat Management and Monitoring Plan (HMMP)/Landscape and Ecology Management Plan (LEMP), and the provision of bird boxes and log piles.

13.2.15 Following implementation of these measures, **negligible** residual operational effects remain on the Thames Basin Heaths SPA and Longmoor Bog SSSI, badger, reptiles and great crested newts which are **not significant**. Several receptors, such as woodland, hedgerows, ponds, bats and birds, are expected to experience **moderate beneficial** ecological outcomes which is **significant**.

Ground Conditions and Contamination

Construction Phase

13.2.16 During the construction phase, inherent mitigation such as the implementation of a Demolition Method Statement (DMS) and a CEMP, and the remediation of localised pockets of contamination either in-situ or through excavation, and the removal of existing tanks, would ensure that the effects of ground contamination and conditions would be **not significant** in terms of EIA.

Operational Phase

13.2.17 Any potential effects are considered to be **not significant** regarding ground conditions and contamination during the operational phase as it is anticipated that any contamination identified during the construction phase will be remediated in line with national and local planning policy upon consideration of the proposed end use.

Noise & Vibration

Construction Phase

13.2.18 During the construction phase, the magnitude of impact on existing sensitive receivers due to construction noise is predicted to be 'negligible'. Due to the sensitivity of the receivers being categorised as 'medium', this results in an overall residual effect of **negligible**, and is **not significant** in terms of EIA. A CEMP will be adopted as part of the inherent design mitigations, and additional mitigation is not expected to be required.

Operational Phase

13.2.19 During the operational phase, the magnitude of impact on existing sensitive receivers due to operational road traffic noise is predicted to be 'negligible' to 'low'. This results in a **negligible** effect which is **not significant** in terms of EIA. Based on the predicted sound pressure levels from the operational phase of the development, additional mitigation is not expected to be required.

Transport & Access

Construction Phase

13.2.20 During the construction phase, an Outline Construction Traffic Management Plan (CTMP) is assumed as part of the inherent design mitigation. The Outline CTMP includes vehicle routing plans and measures to reduce construction impacts. The Proposed Development would have a **negligible** residual effect during the construction phase, which is **not significant** in terms of EIA. As a result, no additional mitigation is required.

Operational Phase

- 13.2.21 During the operational phase, the Proposed Development would have a **negligible** residual effect during the construction phase, which is **not significant** in terms of EIA. As a result, no additional mitigation is required. As no significant effects have been identified throughout the entire study network as a result of the operation of the Development, there is no requirement for additional mitigation.

Hydrology (including Flood Risk & Drainage)

Construction Phase

- 13.2.22 During the construction phase, and prior to additional mitigation, the Proposed Development would have a negligible adverse effect on the Water Framework Directive (WFD) receptors, surface water, groundwater and sewers. Additional mitigation in the form of a CEMP, which would include measures such as silt fencing and bunded fuel/chemical storage, a Flood Emergency Response Plan, exclusion zones and temporary works sequencing, would result in a residual effect to **minor adverse** which would be **not significant** in EIA terms.

Operational Phase

- 13.2.23 During the operational phase, and prior to additional mitigation, the Proposed Development would have a minor adverse to negligible effect on the WFD receptors and surface water. Additional mitigation through the implementation of a multi-stage SuDSs 'treatment train', the limiting of discharge rates, the incorporation of exceedance routes and designing drainage to manage both routine and extreme rainfall would ensure that the Proposed Development results in a residual effect of **minor adverse to negligible**, which is **not significant** in terms of EIA.

13.3 Interaction Effects

- 13.3.1 As discussed in Chapter 5, interactive effects relate to multiple effects from a single development, which may, when experienced together, give rise to a potentially significant impact upon a receptor.
- 13.3.2 Analysis has been undertaken into specific receptors, or receptor groups, to identify any predicted residual effects common to a receptor across more than one assessment within the preceding chapters of this ES. Where one receptor, or group of receptors, are predicted to experience multiple effects, consideration has been given to the interaction of these effects and whether significant interactive effects are likely to arise as a result. An example would be where a local resident is affected by dust, noise and a loss of visual amenity during the construction of a scheme, with the result being a greater impact than each individual effect alone.
- 13.3.3 For some environmental effects, no interactions with other impacts can occur and therefore no interactive effects are considered likely to arise. For example, visual impacts do not interact with impacts on sub-surface land contamination. For other environmental effects it is apparent that interactions could occur and impact in different ways upon an individual receptor. Interactive effects are more likely to arise when the receptor or receptor group is more sensitive to change. Typical examples include ecological and human receptors.

13.3.4 The assessment of interactive effects has been undertaken in two stages.

- The identification and collation of any receptors within the technical assessments predicted to experience a residual effect (significant or otherwise) as a result of the Proposed Development.
- Consideration of the potential interactive effects on the identified receptors from multiple effects.

Receptor Collation

13.3.5 The identified residual effects, as set out within the individual technical chapters of the ES, have been reviewed against the receptors they affect. Where there is more than one effect on a particular receptor, there is a requirement to determine whether there is the potential for interactions. If there is the potential for effect interactions then consideration has been given as to whether this is likely to result in a combined significant effect.

13.3.6 Where possible, to assist the consideration of possible interactive effects, receptors which share the same characteristics, sensitivities or qualifying features, have been grouped together into a single receptor type. For example the 'Population' receptor group incorporate occupiers of existing properties in proximity to the Site as well as public amenity areas, uses or local roads and local population in respect of local services, schools, employment opportunities.

Potential for Interactive Effects

13.3.7 There is no established EIA methodology for assessing and quantifying the combined effects of individual impacts arising from a proposed development on sensitive receptors. The assessment of potential interactive effects has therefore been based upon qualitative professional judgement, taking into account receptor sensitivity and the defined residual effects identified within each technical assessment.

13.3.8 For the purposes of the interactive effects assessment, only residual effects which are classified as being of minor, moderate, or major (or equivalent terminology) significance have been considered. Residual effects of negligible significance have been excluded from the assessment as, by virtue of their definition, they are considered to be imperceptible to an environmental resource or receptor.

13.3.9 Where a receptor group is predicted to experience a range of effects varying in magnitude, the worst case (i.e. greatest adverse impact) has been considered.

Construction Phase

13.3.10 As shown in Table 13.1, during the construction phase of the Proposed Development, no significant effects have been identified. As such, no significant interactive effects are predicted during construction.

Operational Phase

13.3.11 As shown in Table 13.2, during the operational phase of the Proposed Development, moderate beneficial effect on ecological receptors, such as woodland, hedgerows and ponds, and bats and birds, were identified within the ecology chapter. However, no significant effects, either beneficial or adverse, have been identified for other receptors. As such, no significant interactive effects are predicted during the operation of the Proposed Development.

Table 13.1 Interaction Effects during Construction

CONSTRUCTION PHASE	Receptor/Receptor Group					
Environmental Topic	Population	Ecological Receptors	Landscape Character/ Features	Water Environment	Heritage receptors	Climate
Air Quality	-	-	-	-	-	-
Climate Change & Greenhouse Gases	-	-	-	-	-	-
Ecology	-	-	-	-	-	-
Ground Conditions and Contamination	-	-	-	-	-	-
Noise & Vibration	-	-	-	-	-	-
Transport & Access	-	-	-	-	-	-
Hydrology (including Flood Risk & Drainage)	-	-	-	-	-	-

Table 13.2 Interaction Effects during Operation

OPERATION PHASE	Receptor/Receptor Group					
Environmental Topic	Population	Ecological Receptors	Landscape Character/ Features	Water Environment	Heritage receptors	Climate
Air Quality	-	-	-	-	-	-
Climate Change & Greenhouse Gases	-	-	-	-	-	-
Ecology	-	moderate beneficial	-	-	-	-
Ground Conditions and Contamination	-	-	-	-	-	-
Noise & Vibration	-	-	-	-	-	-
Transport & Access	-	-	-	-	-	-
Hydrology (including Flood Risk & Drainage)	-	-	-	-	-	-

13.4 Cumulative Effects

- 13.4.1 As set out in Chapter 5, each chapter of the ES has assessed cumulative effects. Each chapter is taken in turn below and assesses the Proposed Development in cumulation with Barkham Square and then with wider cumulative schemes.

Air Quality

Barkham Square

Construction Phase

- 13.4.2 Potential cumulative demolition and construction effects have been assessed for the Proposed Development in combination with Barkham Square and other cumulative schemes. significant cumulative effects are unlikely to occur as each scheme is anticipated to employ similar dust mitigation techniques such that the individual construction stage effects are not significant, alone or in combination. The inherent mitigation measures contained in the CEMP will reduce the risk of impacts to negligible which will result in temporary not significant (negligible adverse) effects, in accordance with the IAQM guidance.

Operational Phase

- 13.4.3 Operational impacts and effects from road sources have only been assessed for the Proposed Development in combination with Barkham Square and other cumulative schemes. Cumulative effects during operation of the Proposed Development in combination with Barkham Square have been assessed and are considered to be not significant

Wider Committed Development

Construction Phase

- 13.4.4 During construction, potential cumulative demolition and construction effects could occur should construction of cumulative schemes occur at the same time as the Proposed Development and within 250m from the Application Site, according to IAQM guidance. significant cumulative effects are unlikely to occur as each scheme is anticipated to employ similar dust mitigation techniques such that the individual construction stage effects are **not significant**, alone or in combination.

Operational Phase

- 13.4.5 The traffic flows include an overall increase in traffic flows based on the local plan growth and distribution and therefore includes potential cumulative schemes within the study area. Cumulative effects during operation of the Proposed Development have been assessed and are considered to be not significant.

Climate Change and Greenhouse Gases

Barkham Square

- 13.4.6 The cumulative climate change effects of the Proposed Development in combination with Barkham Square are not anticipated to alter the significance conclusions reached for the Proposed Development alone. The combined effect remains minor adverse and not significant.

Wider Committed Development

- 13.4.7 No cumulative effects of greater significance than those reported for the Proposed Development alone are identified. The cumulative effect of the Proposed Development together with the wider committed development is therefore assessed as minor adverse and not significant.

Ecology

Barkham Square

- 13.4.8 Provided that the Proposed Development and the Barkham Square development carry out their own process in terms of HRA and SANGS delivery/contributions as appropriate, impacts on Thames Basin Heath SPA/Longmoor Bog SSSI should be appropriately addressed.
- 13.4.9 Although there are direct habitat connections through shared site boundaries with the Site and Barkham Square, there are limited considerations in terms of species that may navigate and forage along these boundaries (e.g. hazel dormouse); however, bats do require further consideration. Provided that the scheme at Barkham Square delivers a buffer of at least 15m with the ancient woodland between the two sites and retains the line of trees elsewhere along the shared boundary as currently shown, a suitable green corridor will be maintained and continue to provide opportunities for navigating and foraging bats. Furthermore, there are no badger setts currently onsite and the pond (with opportunities for great crested newt and other amphibians) is shown as retained.

Wider Committed Development

- 13.4.10 There is the potential for offsite developments to negatively impact the Site and its habitats. There is potential for territories/ranges of protected species generally to overlap with other proposed developments e.g. birds and bat. However, there is a mitigation strategy onsite that retains/enhances opportunities onsite and provided that each of these sites carries out their own process in terms of HRA and SANGS delivery/contributions as appropriate, impacts on Thames Basin Heath SPA/Longmoor Bog SSSI should be appropriately addressed. Furthermore, schemes will need to deliver BNG, remove invasive species, follow pollution prevention measures and secure relevant protected species licences (as required).

Ground Conditions and Contamination

Barkham Square

- 13.4.11 The proposed Barkham Square development to the north of the site will not add cumulative effects to the assessment of the Site. The land to the north has been the subject to a separate due diligence level ground investigation carried out by Wilson Bailey Partnership and has indicated similar prevailing ground conditions of Loess Clay beneath a generally nominal depth of locally reworked and historically ploughed topsoil with no indications of ground contamination of significance having been identified as part of the ground investigation works.

Wider Committed Development

- 13.4.12 Due to the localised nature of ground condition and contamination impacts, no further cumulative effects for the Proposed Development, when taken in combination with wider committed development, are identified. The cumulative effect of the Proposed Development together with the wider committed development is therefore assessed as not significant.

Noise & Vibration

Barkham Square

13.4.13 Traffic increases from the Barkham Square development have been included in the operational assessment with regards to an increase in road traffic noise. The potential cumulative effects of the Proposed Development and Barkham Square have therefore been assessed.

13.4.14 It is possible that elements of the construction of both the Proposed Development and Barkham square will occur concurrently. However, given the intervening distances between the developments and that both sites will employ best practicable means, the cumulative effect of noise is considered likely to be not significant.

Wider Committed Development

13.4.15 The traffic flows used for the assessment of operational noise include an overall increase in traffic flows based on the local plan growth and distribution and therefore these increases in road traffic noise are considered to have been assessed and the resulting effects are not considered to be significant.

13.4.16 It is not expected that other construction operations on wider committed developments will have a significant effect on the predicted impacts, given the intervening distance and that construction sites are expected to employ best practicable means. It is therefore, considered that the cumulative effect, including wider committed development, will be not significant.

Transport & Access

Barkham Square

13.4.17 The Wokingham Strategic Transport Model (WSTM) provides traffic flows that include all Local Plan growth within the 2040 future baseline without development assessment scenario, including Barkham Square at 600 dwellings. The cumulative effects of Barkham Square (as per the Local Plan) are therefore accounted for in the 2040 future baseline without development scenario. However, it is understood that the planning application for Barkham Square will include 660 dwellings and a 50-bed care home. To accommodate this within this assessment of traffic and transport, the additional 60 homes and care home have been included within the 2040 future baseline with the Proposed Development scenario. The cumulative effects of the Barkham Square planning application including 660 dwellings and a care home are therefore embedded into the 2040 future baseline with development assessment scenario, and no further cumulative assessment is required.

Wider Committed Development

13.4.18 The WSTM also includes all local plan growth and background traffic growth, including all planned developments with planning permission in Wokingham. Therefore, all committed developments are included within all modelled scenarios, and no further assessments of the committed developments are required.

Hydrology (Flood Risk & Drainage)

Barkham Square

13.4.19 As Barkham Square shares elements of the wider local drainage and watercourse network, there is the potential for cumulative interaction during construction and operation. Both developments however incorporate policy-compliant drainage strategies and SuDS measures

and as such, the cumulative magnitude of impact is low and the level of effect is therefore, minor adverse and not significant.

Wider Committed Development

- 13.4.20 Existing cumulative pressures are principally associated with catchment conditions, wastewater infrastructure constraints and climate change. The Proposed Development will restrict surface water runoff to greenfield rates. As a result, the Proposed Development would not materially increase cumulative hydrological pressures. The cumulative magnitude of impact is low and the level of effect is therefore, minor adverse and not significant.

13.5 Conclusion and Next Steps

- 13.5.1 A tabulation of the summary of effects is provided in Appendix 13.1 and a summary of mitigation measures is provided in Appendix 13.2.
- 13.5.2 The ES has considered how the environment and the local community would be affected by the Proposed Development.
- 13.5.3 A range of likely effects have been predicted to occur as a result of the Proposed Development, both beneficial and adverse, and mitigation measures have been identified either within the scheme design or additionally to minimise or offset identified adverse effects where possible.
- 13.5.4 The ES has been submitted alongside other documents in a planning application to the Council. Prior to making a decision, the Council will consult with relevant statutory and non-statutory bodies for advice on the proposals. Members of the general public are also welcome to make comments on the application during this time. The feedback from these consultations will be taken into account by the Council in reaching their decision.
- 13.5.5 The Environmental Statement (including its figures and technical appendices) and other planning application documents can be viewed on the Council's planning applications website:
- 13.5.6 Should interested parties wish to make representations on the content of this ES, they should be made in writing by post or by email at:

<https://www.wokingham.gov.uk/planning/existing-planning-applications>

planning.enquiries@wokingham.gov.uk

Wokingham Borough Council

Shute End

Wokingham, Berkshire

RG40 1BN

0118 974 6000

- 13.5.7 Alternatively, representations can be made online by following instructions at:

<https://www.wokingham.gov.uk/planning/existing-planning-applications/comment-planning-application>

Gavin Hall
**Director & Head of Savills
EIA**
GHall@savills.com



Matt Lindon
**Associate Director EIA
Consultant**
Matt.Lindon@savills.com



Jack Bell
**Senior Planner & EIA
Consultant**
Jack.Bell@savills.com

