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PENTLAND HOMES & JARVIS HOMES

KINGSNORTH GREEN, ASHFORD

ENVIRONMENTAL STATEMENT ADDENDUM

OCTOBER 2022

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APPENDICES

1 Introduction

1.1.1 This Environmental Statement (ES) Addendum has been prepared by Wardell Armstrong LLP (WA) on behalf of Pentland Homes and Jarvis Homes (the 'Applicant') to provide additional information on the potential environmental effects for a proposed mixed-use development (the 'Proposed Development') on land south of Kingsnorth, Ashford (the 'Site') in relation to the addition of an on-site Wastewater Treatment Works (WwTW).

1.2 Background

June 2015 Application

1.2.1 In June 2015, the Applicant sought to obtain outline planning permission for the following from Ashford Borough Council (ABC) as the relevant planning authority:

- A proposed mixed-use development of up to 750 dwellings of mixed type and tenure
- Up to 210 m2 (gross internal floor space) of A1 – A5 uses, but with no individual units greater than 150 m2
- Up to 180 m2 (gross internal floor space) of community leisure uses of class D1 and D2
- 1 form entry Primary School
- Provision of local recycling facilities
- Provision of areas of formal and informal open space
- Installation of utilities infrastructure to serve the development including flood attenuation, surface water attenuation, water supply, wastewater facilities, gas supply, electricity supply including sub-station, telecommunications infrastructure and renewable energy.
- Transport infrastructure including a new access roundabout in the vicinity of the Ashford Road / Magpie Hall Road / Steeds Lane Junction, new priority control junctions on Ashford Road, a new distributor road through the site to provide relief to the existing Ashford Road plus an internal network of roads and junctions, footpaths and cycle routes.

- New planting and landscaping both within the proposed development and on its boundaries as well as ecological enhancement / mitigation works.
- Associated ground works

1.2.2 Due to the scale of the proposals, it was determined that they comprised Environmental Impact Assessment (EIA) development as defined by the Town and Country Planning (EIA) Regulations 2011. Therefore, an ES prepared by WA was submitted in support of the 2015 application (Ref.15/00856/AS). It was estimated that the development would be completed within approximately 5 years upon planning being granted based on an average completion rate of 150-200 dwellings per year.

2017 ES Addendum

1.2.3 Following submission of the 2015 application and further discussions between the Applicant and ABC, it was decided to amend the application, reducing the size of the scheme from 750 dwellings to 550 dwellings in accordance with the emerging local plan. The size of the Site was also reduced, increasing the offset from Kingsnorth.

1.2.4 An ES Addendum was produced in 2017 to assess whether the proposed amendments gave rise to materially new or materially different environmental effects as previously assessed and reported within the 2015 ES. The 2017 ES Addendum also considered the length of time that had passed since the 2015 application was submitted; and consultee comments received in relation to the 2015 application.

2020 ES Addendum

1.2.5 The application was taken to committee in November 2018 with a recommendation for approval. The committee resolved to grant outline planning permission, subject to expiry of the site notice and a section 106 agreement. Concerns were raised regarding the consultation period for the application, and ABC subsequently held a further consultation period on the application. In addition, ABC commissioned Temple Group to undertake an independent review of the 2015 ES and 2017 ES addendum in September 2019.

1.2.6 An ES Addendum was subsequently prepared to address the matters raised within the Temple Group Review; and undertake an updated assessment of potential cumulative effects with developments which had come forward since submission of the 2015 ES and 2017 ES Addendum.

1.3 Purpose of the Addendum

1.3.1 In November 2020, Natural England (NE) issued *Advice on Nutrient Neutrality for New Development in the Stour catchment in relation to Stodmarsh Designated Sites – For Local Planning Authorities*. In summary, the consequence of this Advice is to avoid the potential for any further deterioration in the water quality of the Stodmarsh European designated site pending further investigations as to the cause of eutrophication at Stodmarsh. This has direct consequences for some new development proposals, including the Proposed Development.

1.3.2 Subsequently, a Nutrient Neutrality Assessment has been undertaken for the Proposed Development which identified appropriate mitigation measures, including an on-site Wastewater Treatment Works (WwTW).

1.3.3 This ES Addendum has been prepared to assess whether the addition of the WwTW within the Proposed Development gives rise to materially new or materially different environmental effects as previously assessed and reported within the 2015 ES, 2017 ES Addendum and 2020 ES Addendum.

1.3.4 This Addendum does not supersede the 2015 ES, 2017 ES Addendum or 2020 ES Addendum, but rather provides additional information assessing the effects that could arise as a result of the addition of the WwTW to the Proposed Development. As such this Addendum should be read in conjunction with the 2015 ES, 2017 ES Addendum and 2020 ES Addendum.

1.3.5 The updated Parameters Plans showing the location of the WwTW are included at Appendix 1.1.

1.4 Legislative Context

1.4.1 The 2015 ES was prepared in accordance with the Town and Country Planning (EIA) Regulations 2011 (the '2011 Regulations)'. The new Town and Country Planning (EIA) Regulations 2017 came into force on the 16th of May 2017 (the '2017 Regulations'). However, under Regulation 76 of the 2017 Regulations, the 2011 Regulations continue to apply to the Proposed Development as an ES was submitted prior to the 16th of May 2017. Thus the 2017 Regulations are not relevant to this ES Addendum, or the existing ES.

2 SCOPE OF THE ADDENDUM

2.1.1 The potential impacts of the addition of the WwTW have been reviewed in the context of the environmental assessments previously undertaken, to assess whether the amendments give rise to materially new or materially different environmental effects as previously assessed and reported.

2.2 Non-Technical Sections

2.2.1 With regards to the non-technical sections of the previous ES and ES Addendums, the only change comprises the addition of the WwTW in the northwest corner of Area 1 to the description of development.

2.2.2 The updated Parameters Plans showing the location of the WwTW are included at Appendix 1.1.

2.3 Technical Sections

2.3.1 The following technical assessments have been considered within this addendum:

- Ground Conditions;
- Landscape and Visual Impact;
- Ecology;
- Archaeology and Cultural Heritage;
- Water Resources;
- Noise and Vibration;
- Air Quality; and
- Climate Change.

2.3.2 An updated Flood Risk Assessment has also been undertaken and is included at Appendix 2.1. An updated arboricultural survey has been undertaken and the updated AIA is included at Appendix 2.2.

Topics not considered further

2.3.3 Within the 2020 ES Addendum the assessment of land use and soils considered the area of best and most valuable (BMV) land lost across the Site as a whole. No breakdown of BMV loss was undertaken in relation to specific land uses as it is not proposed to retain any agricultural use within the Proposed Development. As the

application boundary is unchanged, no update to the previous assessment is required and the findings of the 2020 ES Addendum remain valid in relation to Land Use and Soils.

2.3.4 Transport was considered within the 2020 ES Addendum, however as the quantum of development remains the same it is not considered that any updates to the transport assessment are required. Traffic movements associated with the WwTW will be negligible. Therefore, the findings of the 2020 ES Addendum remain valid in relation to Transport.

3 GROUND CONDITIONS

3.1 INTRODUCTION

3.1.1 This addendum is not a standalone assessment and should be read in conjunction with the 2015 ES and 2017 and 2020 ES Addendums. This chapter considers whether ground conditions will likely be affected by the proposed Wastewater Treatment Works (WwTW).

3.1.2 This chapter assesses the ground condition impacts of the Proposed Development only in relation to the newly proposed WwTW as all other ground condition aspects of the development remain the same. This chapter includes consideration of:

- The potential impact on ground conditions from the construction of the proposed WwTW.
- The potential impact on the WwTW from the likely encountered ground conditions.
- The potential contaminative impact of the proposed WwTW on ground conditions and sensitive receptors.

3.1.3 To provide an addendum to the previous ground conditions chapter, the following has been undertaken:

- Review of proposed specification and of WwTW to assess whether ground conditions will likely be affected or generally remain the same.
- Assess likely contamination sources, if any.

3.2 PROPOSED WwTW

3.2.1 A new on-site Severn Trent Connect (STC) WwTW is being proposed by the Applicant in order to ensure the Proposed Development achieves nutrient neutrality in accordance with the Natural England guidance. Under this option, all 4 areas of the development will drain to a single treatment works located in the northwest corner of area 1. Treated water would then be discharged to the public sewer network at a restricted rate.

3.2.2 This type of compact sewage treatment comprises various units (including sequential batch reactors, control kiosk, etc.) that provide an efficient solution to address the nutrient neutrality challenge. Nutrient Neutrality, or Nitrate Neutrality as it is commonly called, has become a key obstacle for developers when seeking to obtain

planning approval in counties that host areas protected under the Water Environment Regulations and Conservation of Habitats and Species Regulations. These protected areas may already experience high input levels of nitrogen and phosphorus into the water environment contributing to eutrophication at these designated sites.

3.2.3 The STC WwTW implements an effective advanced biological treatment process utilising cyclic activated sludge technology to achieve simultaneous nitrification and denitrification for the effective removal of nitrates and phosphorus. This process does not require chemical dosing.

3.2.4 This compact standard packaged treatment solution is located above ground in this instance. The waste water is first screened through an inlet to remove coarse material. This effluent then flows to the balance tank for storage and fermentation (biological treatment) prior to being conveyed to the reactors.

3.2.5 The effluent is fed forward at a controlled rate into two sequential reactors for multiple cycles of aeration, mixing and settlement. The typical reactor cycle time prior to discharge is 10 hours, but this duration is also flexible depending on treatment requirements. The level of optimisation can be increased and recorded via sensors, onsite testing and remote telemetry to ensure effluent meets the necessary quality requirements.

3.2.6 The reactor process is where sludge is generated. Some of this sludge material will be recycled within the treatment process and the remainder is stored in the sludge holding tank for collection by tanker. The sludge is also thickened in a separate aerated tank to reduce its volume before being stored. This material can be processed into biogas at a suitable facility.

3.2.7 The treated effluent then flows from the reactor to the attenuation tank before releasing a steady flow to the final effluent chamber (outlet). Sampling of water can take place at this final/sample chamber prior to discharge to the receiving water body (i.e., public sewer network).

3.2.8 Volume and quality parameters are logged and continuously monitored at suitable discharge points to ensure compliance with all relevant environmental requirements.

3.3 KEY IMPACTS & LIKELY SIGNIFICANT EFFECTS

3.3.1 The proposed WwTW specification details the proposed implementation of on-site Balance Tank, Reactors, Attenuation Tank, Aerated Sludge Thickening Tank and Aerated Sludge Holding.

3.3.2 The proposed STC WwTW process will see the generated sludge removed from site by tanker and the treated effluent discharged to the appropriate receiving water body or sewer network.

3.3.3 This closed system ensures that contaminative risks are minimal.

3.3.4 All other potential impacts are as set out in the previous ES and ES Addendums and summarised in the table below.

Table 3.1: Significance of Level of Effect - without mitigation

Potential effect	Level of Effect (pre-mitigation)
Construction stage	
Soil contamination associated with agricultural use within the area of site. Leached agricultural inputs, i.e., fertiliser, pesticides, herbicides, etc; The entire site and surrounding area is indicated to be within a Nitrate Vulnerable Zone (NVZ).	**Moderate - Adverse**
Fuel and oil-based hydrocarbon contamination associated with plant and machinery activity on site.	**Moderate - Adverse**
Contamination of the ground due to activities relating to the development. This could include spillage of oils and fuel from plant working at the site, chemical spillages, and construction wastes, etc.	**Moderate - Adverse**
The potential for localised contamination associated with adjacent land uses.	**Moderate - Adverse**
Operational stage	
Excluding unforeseen activities/alterations undertaken within the individual housing plots and surrounding area, the effects of the post-completion ground conditions are deemed to be the same as those in the construction stage. There may be less risk to humans in areas where contamination has been removed during earthworks or where hardstanding has been installed during the construction phase.	**Minor**
The potential for localised contamination associated with the WwTWs and adjacent land uses.	**Moderate - Adverse**

3.4 MITIGATION

Construction

3.4.1 As part of the detailed design stages of the development, where relevant, it would be sensible to undertake further assessment to determine the contaminative status of the site. This is especially prudent with regards to the proposed position of the WwTW.

Undertaking ground investigation works in this area provides a baseline of contaminative risk to compare against results of any post construction testing/assessment.

3.4.2 This level of assessment would aim to characterise the general geochemical nature of the site as well as focusing on particular areas of the site where potential contaminative conditions have been identified as part of the desk study researches, i.e., the nearby garage, car body repair shop, pest control service, etc. Assessment of the results of this testing will inform whether mitigation measures would be required.

3.4.3 Assessment of the ground conditions at the site will inform the design of the foundations appropriate for the structures and facilities within the development. If required, particular measures should be utilised to prepare the ground for development.

3.4.4 An appropriate intrusive ground investigation should be undertaken once a detailed development layout is finalised. This investigation will provide up-to-date information pertaining to the contaminative and geotechnical characteristics of the shallow ground and will aid in the design of mitigation measures should they be deemed necessary/appropriate.

3.4.5 In terms of minimising the impact of the Proposed Development on the ground conditions, there would be a requirement during the development phase to ensure that materials and chemicals used during the construction would not impact the ground adversely. This would involve the implementation of a Construction Environmental Management Plan (CEMP).

3.4.6 A CEMP ensures that environmental impacts identified during previously performed environmental studies (e.g., an EIA) or during the scoping phase, will be properly managed and that controls will be put in place to reduce the impacts of the development on the natural and human environment during construction.

3.4.7 This will outline mitigation measures such as the use of bunded tanks, regular vehicle maintenance and minimisation of construction related waste. Appropriate measures should be in place to deal with accidental spills and any wastes produced during construction. Construction activities would also require material management plans to be prepared and implemented to audit waste materials and minimise potential adverse impacts to the ground.

3.4.8 The following points should be considered before installation of the WwTW:

- The discharge must have the consent of the relevant Environmental Regulator.
- The installation should have Planning and Building Control approval.
- Ground conditions and water table level should be assessed with regards to any underground installations (i.e. tanks, services). When WwTW unit is installed in unstable ground conditions, where movement of the surrounding material and/or unit(s) may occur, the connecting pipe work should be designed to minimise the risk of damage from differential movement of the unit(s) and/or surrounding material.

Operation

3.4.9 If identified as appropriate during the construction phase, a regime of on-going monitoring and assessment should be undertaken to review the impact of construction activity. The duration of this post-works assessment should be based on the achievement of designated site criteria. Post-work surveys are carried out to confirm the long-term effectiveness of the mitigation procedures undertaken during the construction phase.

3.4.10 There are few measures that may be put in place to minimise the impact that individuals occupying the Proposed Development may have on the ground conditions. However, the clayey nature of the mudstone would help to contain any spillage or contamination within any isolated location and impede transmission.

3.4.11 With the right maintenance, WwTWs can last a long time without needing any significant work. Wastewater treatment plants are designed with the user in mind and are kept user-friendly by making sure the maintenance is kept to a minimum. However, the system will be monitored and/or repaired by a professional service engineer as required.

3.5 RESIDUAL EFFECTS

3.5.1 It is considered that the current agricultural land use of the site presents minimal impact upon the Proposed Development of the site. Where limited potential impacts associated with particular features at the Site and surrounding area have been identified, it is considered that with the implementation of appropriate mitigation measures, residual effects will not be significant.

Table 3.2 – Significance of Residual Impact – with mitigation

Potential effect	Level of effect (pre-mitigation)	Mitigation measure	Level of residual effect
Construction stage			
Potential contamination associated with the installation of proposed WwTW	**Minor - Adverse**	Installation in line with WwTW-specific installation guidelines	**Negligible**
Clay at shallow depths, which has the potential to heave / shrink due to the influence of trees.	**Minor - Adverse**	As part of the detailed design stages of the development, where relevant, it would be beneficial to undertake further assessment to determine the contaminative status of the site. Specific mitigation measures will be required to reduce significant adverse effects potentially caused by the Proposed Development. In terms of minimising the impact of the Proposed Development on the ground conditions, there would be a requirement during the development/construction phase to ensure that materials and chemicals used during the construction would not impact the ground adversely. Implementation of a CEMP. This would involve the use of bunded tanks, regular vehicle maintenance and minimisation of construction related waste.	**Negligible**
High water table at site.	**Minor - Adverse**		**Negligible**
Localised softening and/or desiccation of clay.	**Minor - Adverse**		**Negligible**
Soil contamination associated with agricultural use within the area of site. Leached agricultural inputs, i.e., fertiliser, pesticides, herbicides, etc. The entire site and surrounding area are indicated to be within an NVZ	**Moderate - Adverse**		**Minor**
Localised ground gases associated with topsoil materials.	**Minor - Adverse**		**Negligible**
Removal or incorporation of trees and shrubs within the development could have an impact on ground conditions.	**Minor**		**Negligible**
Fuel and oil-based hydrocarbon contamination associated with	**Moderate - Adverse**		**Negligible**

Potential effect	Level of effect (pre-mitigation)	Mitigation measure	Level of residual effect
plant and machinery activity on site.		Appropriate measures should be in place to deal with accidental spills and any wastes produced during construction. Construction activities would also require material management plans to be prepared and implemented to audit waste materials and minimise potential adverse impacts to the ground.	
Contamination of the ground due to activities relating to the development. This could include spillage of oils and fuel from plant working at the site, chemical spillages, and construction wastes, etc.	**Moderate - Adverse**		**Minor**
The potential for localised contamination associated with adjacent land uses.	**Moderate - Adverse**		**Minor**
Removal of topsoil materials and tracking of plant across uncovered cohesive bedrock material.	**Minor**		**Negligible**
Removal of topsoil materials is likely to increase surface run-off.	**Minor**		**Negligible**
Post-completion stage			
Potential contamination associated with the operation of proposed WwTW	**Moderate - Adverse**	Maintenance and repairs in line with WwTW-specific maintenance guidelines.	**Minor**
Excluding unforeseen activities/alterations undertaken within the individual housing plots, the effects of the post-completion ground conditions are deemed to be the same as those in the construction stage.	**Minor**	A regime of geochemical/geotechnical assessment should be undertaken shortly after the development phase to review the impact of construction activity. The duration of this post-works assessment should be based on the achievement of designated site criteria. Post-work surveys and	**Negligible**
Activities undertaken within the individual housing plots. This could include spillages of oils,	**Minor**		**Negligible**

Potential effect	Level of effect (pre-mitigation)	Mitigation measure	Level of residual effect
fuels or other chemicals associated with vehicle and household activities.		validation assessment are carried out to confirm the long-term effectiveness of the mitigation procedures undertaken during the construction phase. There are measures that may be put in place to minimise the impact that individuals occupying the Proposed Development may have on the ground conditions. However, the predominately clayey nature of the mudstone would help to contain any spillage or contamination within any isolated location and impede transmission.	
The potential for localised contamination associated with adjacent land uses.	**Moderate - Adverse**		**Minor**
The roads serving the development provide further potential for contamination of the ground. The potential presence of sewerage within the ground also identifies a potential for pollution of the site due to leakage or overflow from the sewer network.	**Minor**		**Negligible**

3.5.2 Should the Proposed Development progress, no further cumulative effects are predicted, and any residual impacts are likely to be the same as those discussed above.

3.6 CONCLUSIONS

3.6.1 The operation of a WwTW poses a potential contamination risk. However, this is deemed to be limited risk due to the size and specification of the proposed treatment system.

3.6.2 Appropriate method statements and risk assessments should be produced and adhered to by the contractor to ensure that the risk of contamination arising due to the contractor's work is minimised.

3.6.3 As part of the detailed design works, following the formation of a detailed development layout, intrusive ground investigation works should be undertaken to better characterise the site in terms of the above potential issues. This investigation would aid the design of foundations and confirm the contaminative status of the site. This is fundamental for the most appropriate siting of the WwTW. The location and design of the WwTW will need to be determined by a qualified engineer.

3.6.4 The assessment undertaken as part of this environmental statement is adequate at this current stage of the works, and given the site's past and present use, the assessment concludes residual effects will not be significant.

3.6.5 All checks must be made to ensure that, once in operation, the proposed WwTW does not impact on the ground conditions. As standard, the treatment process ensures that discharged effluent is clean and leaking of the relevant plant is very unlikely. Subsequently, potential contamination sourced from the proposed WwTW is not only limited, but also regulated, by the specification of the plant and intrinsic treatment process itself.

3.6.6 WwTW should be serviced by an appreciate engineer to ensure that there are no blockages and the effluent being discharged is safe for the local environment. All servicing should be carried out by a properly trained professional with appropriate experience with mechanical and electrical components.

3.6.7 Following the development of the site, it is considered that with appropriate precautions, there will not be any significant residual effects related to the ground conditions at the site.

4 LANDSCAPE AND VISUAL

4.1 Introduction

4.1.1 This addendum should be read in conjunction with the 2015 ES and 2020 ES Addendum. It presents a revision of the original (2015) LVIA and subsequent updates in the 2020 Addendum in relation to potential effects upon the character and fabric of the landscape and upon visual receptors as a result of the introduction of the proposed Wastewater Treatment Works (WwTW) into the scheme.

4.1.2 This chapter reviews changes to the previously reported impacts only in relation to the proposed WwTW and reassesses the effects of the WwTW together with (and thus as part of) the Proposed Development, as all other aspects of the development remain the same. For clarity, the conclusion of this chapter therefore provides a revised assessment of the landscape and visual effects associated with the Proposed Development to include the proposed Wastewater Treatment Works.

4.1.3 To provide an addendum to the previous chapter, the following has been undertaken:

- Review of any updates to relevant policy;
- Review of the landscape character baseline; and
- Reassessment of visual effects presented in 2015 to include the WwTW.

4.2 Legislation, Policy and Guidance

National Planning Policy

4.2.1 The revised National Planning Policy Framework (NPPF), published in July 2021, contains the Government's planning policies and provides a framework to "contribute to the achievement of sustainable development". Of the NPPF's three overarching and interdependent objectives in pursuit of achieving of sustainable development, the environmental objective (paragraph 8) seeks to contribute to the protection and enhancement of the natural, built and historic environment.

4.2.2 In relation to development and good design (section 12):

- Paragraph 130 advises that the planning system and new development should be sympathetic to local character and history, including the surrounding built environment and landscape setting, and foster a strong sense of place, while not preventing or discouraging appropriate innovation or change.

- Paragraph 130 indicates that design quality should be considered throughout the evolution and assessment of individual proposals.

4.2.3 With regard to the conservation and enhancement of the natural environment (Section 15), in landscape and character terms:

- Paragraph 174 notes that the intrinsic character and beauty of the countryside should be recognised, and valued landscapes should be protected and enhanced.
- Paragraph 176 states "*Great weight should be given to conserving and enhancing landscape and scenic beauty in National Parks… and Areas of Outstanding Natural Beauty which have the highest status of protection in relation to these issues*."

Local Planning Policy

4.2.4 The 2011 Core Strategy referred to in the Original 2015 ES was replaced by the Ashford Local Plan 2030, adopted February 2019. The Adopted Local Plan includes Policy ENV3a 'Landscape Character and Design' (which supersedes the Core Strategy's Policy CS9 'Design Quality'). This states:

"All proposals for development in the borough shall demonstrate particular regard to the following landscape characteristics, proportionately, according to the landscape significance of the site:

a) Landform, topography and natural patterns of drainage;

b) The pattern and composition of trees and woodlands;

c) The type and composition of wildlife habitats; d) The pattern and composition of field boundaries;

e) The pattern and distribution of settlements, roads and footpaths;

f) The presence and pattern of historic landscape features;

g) The setting, scale, layout, design and detailing of vernacular buildings and other traditional man made features;

h) Any relevant guidance given in the Landscape Character SPD;

i) Existing features that are important to and contribute to the definition of the local landscape character shall be retained and incorporated into the proposed development; and,

j) Any non-designated, locally-identified, significant landscape features justified in a Parish Plan or equivalent document.

4.3 Assessment Methodology and Significance Criteria

4.3.1 The assessment methodology utilised is as per the 2020 ES Addendum. This is provided at Appendix 4.1.

4.4 Baseline Conditions

4.4.1 The landscape character baseline publications, the study area and visual review of the Site and the Study Area were outlined within the 2015 ES and the 2020 ES Addendum.

4.5 Assessment of Effects

4.5.1 The development proposals are described in Chapters 1 and 2 and illustrated on the Parameter Plans found at Appendix 1.1.

4.5.2 In summary, principal changes of relevance to the consideration of landscape and visual impacts comprise:

- The introduction of an on-site Wastewater Treatment Works (WWTW) in Area 1 with built elements to a maximum height of 6.35m and gantries to 7.5m
- Alterations to the northern residential built edge of Area 1
- Larger / repositioned attenuation features in the north of Area 1

4.5.3 In summary, different or additional likely impacts upon the landscape and visual receptors arising from the changes to the scheme primarily comprise:

- Construction of the new WwTW plant including tanks, plant buildings and an office
- Creation of the larger attenuation features
- Views towards construction and installation of the WwTW
- Views towards the WwTW on completion of the scheme
- Alteration to views arising from the relocated and enlarged attenuation features

Design Solutions and Assumptions

4.5.4 The Development Proposals are submitted in outline, and as such the proposed WwTW have been assessed on the basis of the positions indicated on the Parameter Plans at Appendix 1.1. It is assumed that the works (including construction / installation) would comprise an access off the proposed residential road network, hardstanding within the compound, an MCC Kiosk, generator, acoustic compressor house and office buildings, and a series of balance, reactor, attenuation, compact inlet works and sludge tanks with gantries (bridges / walkways with handrails).

Landscape Character

4.5.5 The 2020 LVIA Addendum notes that the Site, its immediate setting and the majority of the Study Area lies within the 'Bethersden Farmlands' CA as defined within The Landscape Assessment of Kent (2004). On the basis of the analysis and description provided, the 2020 Addendum considered this landscape within the Study Area to be of medium sensitivity.

4.5.6 The 2015 LVIA identified that the Site falls within two DLTs; 'Kingsnorth Arable' to the west of Ashford Road (including Areas 1 and 2) and 'Kingsnorth Wooded Pasture' to the east (encompassing Areas 3 and 4). The assessment of effects on the landscape resource as set out within the 2015 LVIA was carried out by reference to these.

4.5.7 The Original (2015) ES considered the susceptibility to change of the landscape within the Study Area to the development proposed to be Low to Medium. However, this does not identify impacts upon each composite DLT within the Study Area or upon the Site itself as separate, identifiable landscape receptors. This is set out below.

4.5.8 Analysis is presented within the 2005 'Landscape Character Study', which defines the 'Kingsnorth Arable' DLT as undulating mixed farmland of medium-sized fields with remnant hedges, some fencing and intermittent hedgerow trees, linear settlement along local roads and some open views. Aspects of its character are generally described of moderate condition and moderate or high sensitivity. On balance this is determined to be of medium sensitivity for the purpose of this assessment.

4.5.9 The Proposed Development would result in some loss of farmland although the field parcel structure, bounding hedgerows and trees would be largely retained, as would other key characteristics of the DLT. The introduced residential development would represent an intensification of built form and would not be reflective of the characteristic linear pattern. The magnitude of change is considered to be medium, with a Moderate Adverse level of effect. However, beneficial effects would arise from additional hedgerow planting and creation of areas of green space. The WwTW would introduce additional built form, however this would not alter the distribution of open space / proposed landscape, and the northern extent of built form within Area 1 would remain comparable. SuDs features are already proposed as part of the scheme in the north of Area 1, and the altered size / location of these would therefore not result in greater impacts upon the landscape at this scale. It is not considered that the amendments to the scheme presented in this addendum would have any material impact upon this DLT further to the effects already reported.

4.5.10 The analysis of the whole of the 'Kingsnorth Wooded Pasture' DLT within the 2005 Character Study is described as open, undulating mixed farmland with a combination of gappy and strong hedges with intermittent trees and some woodlands. It is generally defined as having moderate condition and moderate sensitivity. This is therefore determined to be of medium sensitivity for the purpose of this assessment.

4.5.11 Development within Areas 3 and 4 would result in a change of land use from farmland to development, open / green space and sports and recreation. There would be some loss of hedgerows to facilitate the development and create access between land parcels. Buffers to some key habitats such as select hedgerows with trees and around Isaac Wood. Beneficial effects include buffers to some key habitats, additional hedgerow planting and creation of areas of landscaped open space. The magnitude of change is considered to be medium, with a Moderate Adverse level of effect. Changes proposed to the scheme would not have any new or different impacts upon this DLT.

4.5.12 Regarding impacts upon the Site itself and its immediate setting, the susceptibility to change, landscape value and magnitude of change is set out in the tables below.

Table 4.1 Susceptibility to Change

Factors affecting Susceptibility	Comment	Susceptibility
Topography	Predominantly flat topography, with a slight ridge south-southeast to north-northwest	Low-Medium
Visibility		
- Views	Slight ridge across the centre of site controls views across entire site, particularly between the north and south. Views are also controlled by hedgerows and clustered / linear settlement.	Low-Medium
- Skylines	Visible extents are limited due to gentle landform combined with field boundary vegetation, settlement on the edge of Ashford and along roads in close proximity to the site, although there are some views to the north.	Low-Medium
Vegetation		
- Pattern and complexity	Typically medium scale arable fields with some hedgerow loss making larger parcels. Smaller paddocks nearer settlement are enclosed by hedgerows which can be gappy. Some tree lines / belts along select field boundaries. Woodland occurrence and scale increases to the south.	Low-Medium
- Screening	Hedgerows and trees will provide partial screening of the development.	Medium

Table 4.1 Susceptibility to Change		
Factors affecting Susceptibility	Comment	Susceptibility
<u>Existing Development</u>		
- Residential	Has an urbanising effect on landscape character however dwellings bordering the site typically comprise small clusters or settlement is linear, aligned along local roads.	Medium
- Agricultural buildings	Relatively frequent scattered farmsteads within the proximate rural area, typically situated directly along local roads with fields to the rear. Provides screening of the development.	Low-Medium
- Major roads	Urbanising influence on character.	Low
Overall Susceptibility to Change		Low-Medium

4.5.13 An appraisal of the landscape value of the Site and its immediate setting according to the methodology applied to this assessment and examined against factors set out in GLVIA3 Box 5.1 is set out below:

Table 4.2 Components contributing to Landscape Value		
Components	Comment	Value
Landscape Designations	The Site does not lie within or adjacent to any designated landscapes e.g. National Parks, AONBs. The Kingsnorth Conservation Area lies in close proximity to the north.	Low-Medium
Landscape Quality/Condition	The site comprises hedgerows and hedgerow trees enclosing arable farmland. Land to the north of the site is well developed. Remaining land surrounding the site comprises hedgerows and hedgerow trees enclosing arable farmland.	Medium
Scenic Quality	The landscape of the site and its setting partially contributes to the scenic quality of the wider Study Area. Urbanised landscape to the north of the site detracts from the scenic quality.	Medium
Rarity	It is not considered that the Site itself nor its setting contains any rare landscape elements or features.	N/A
Representativeness	The site and its surroundings are a typical example of their DLTs.	Medium
Conservation Interests	Ancient Woodland partially within the site. No further designations within the site.	Medium
Recreation Value	There is no recreational provision within the site however there are a number of public rights of way crossing the Site and the immediate area, including the Greensand Way.	Medium-High
Perceptional Aspects	Tranquillity of site affected by urbanisation to the north and transmission towers to the west.	Low-Medium
Associations	None identified.	N/A
Overall Landscape Value		Medium

4.5.14 From the above analysis it is determined that the sensitivity of the landscape of the Site and its immediate setting is considered **medium**.

4.5.15 The magnitude of change upon the landscape of the Site and its immediate setting are outlined in Table 4.3 below.

Table 4.3 Magnitude of Landscape Effects on the Site and its Setting

Landscape Components	Description (incl. Size and Scale)	Duration / Reversibility	Magnitude of Change
Loss of arable farmland	Change from arable farmland to residential development with areas of green space.	Permanent	High Adverse
Addition of residential development	Introduction of new residential development, roads, recreational / sports facilities, planting and WwTWs.	Permanent	High Adverse
Creation of green space	Some change of land use from farmland to landscaped open space and green space.	Permanent	Slight Beneficial
Loss of hedgerows and trees	Limited local removal of hedgerows to provide access to and through the Site	Permanent	Slight Adverse
New hedgerow and tree planting	Additional planting of trees and hedgerows within site	Permanent	Slight Beneficial
Overall Magnitude of Landscape Effect within Study Area			Medium-High

4.5.16 Consequently, on balance the landscape effect of these proposals would be Moderate-Substantial adverse upon the Site and its immediate setting.

4.5.17 While there would be some modification to the built development within the Site as a result of the introduction of the WwTW and revision to the design of the attenuation basins, these elements are largely situated within the previous footprint of the residential land use or located broadly where previously proposed, respectively. Consequently, although there is some material alteration, this is very limited and it is not considered to result in any change to the magnitude or predicted level of effect.

Visual Receptors

4.5.18 Receptors potentially subject to visual impacts as reported in the 2015 LVIA comprise:

- Motorists and road users on Ashford Road, Pound Lane, Magpie Hall Road, Steeds Lane, Bond Lane, Stumble Lane and Church Hill;
- Users of the Public Rights of Way network within the site and the surrounding area;
- Residents of properties located in Kingsnorth and on the roads listed above; and
- Ashford Town Cricket Club.

4.5.19 The representative Photoviews are included at Appendix 4.3, with the locations of the Photoviews included on the Visual Analysis Plan at Appendix 4.2.

4.5.20 Given the localised nature of the change to the scheme and the degree of enclosure by existing landscape elements and the Proposed Development, the extent of visual influence is very limited. Receptors considered potentially subject to change to their views as a result of the alteration to the scheme associated with the WwTW comprise:

- Road users and Public Right of Way (PRoW) receptors on a short section of the Greensands Way long distance trail to the north along Pound Lane;
- Users along a short section of the Greensands Way / PRoW intersection to the north-west; and
- Select residents of properties located at the eastern end of Pound Lane.

4.5.21 These are represented by Photoviews 20 and 21.

4.5.22 The detail of the change to views is provided below and based upon the original assessment presented in the 2015 Visual Effects Tables at Appendix 4.4.

4.5.23 The proposed plant would be within the extents of the built development areas, and as such although there would be some minor alteration to the composition of views (comprising the WwTW and amended SuDs basins) these would be observed within a view already altered by new residential development with proposed dwellings forming part of the immediate setting.

4.5.24 **Road and PRoW users along Pound Lane**: these receptors are represented by Photoview 20. Proposed construction activity within Area 1 would be seen at the same distance compared to the submitted scheme. Construction of the new access off Pound Lane would remain a key visible component in the immediate foreground. There may be some perception of alterations within the view arising from the change in SuDs design and the WwTW rather than housing, however, the magnitude of change would be no greater. Construction effects remain unchanged.

4.5.25 On completion, new residential development and the WwTW would be seen at short distance together with recently completed SuDs features and landscape planting. The magnitude of change would remain to be high with the levels of effects as previously assessed. The industrial nature of the WwTW may appear more apparent along Area 1's built edge (particularly given the nature of the built elements including the tanks

and gantries), however the maximum heights of the various elements (up to 7.5m) would be less than those stated on the submitted parameter plans (up to 11m).

4.5.26 It is assumed that a scheme of structural landscaping would be implemented along the built edge of the scheme as previously incorporated (adapted to accommodate the WwTW layout), thus providing increased screening over time. As at completion, there may be glimpses of the elements of the plant, potentially introducing further adverse impacts given the industrial nature of the works. However, these are at a lower height than the submitted housing maximum parameters. There would therefore be some alteration to the nature of the change although it is considered to remain at a Low magnitude. At 10 years, on balance the effects upon road users are considered to be Slight to Moderate Adverse upon road users and Moderate to Substantial Adverse for PRoW users.

4.5.27 **PRoW users to the North-west**: these receptors are represented by Photoview 21. Views of both the construction activity and the completed scheme are identified as being subject to notable screening by intervening vegetation. Consequently, receptors may not discern change to the proposals, or change may be difficult to discern as a result of distance and screening. While there may be very marginal alterations in visible activity and elements during both construction and operational phases it is considered that the magnitude of change and level of effect would remain unchanged relative to the impacts associated with the submitted scheme.

4.5.28 **Select residents on Pound Lane:** these receptors are not represented by a Photoview, but paragraph 13.9.32 of the 2015 LVIA notes that "*Visual impacts on these properties would … be substantial to very substantial adverse. However ten years after construction impacts on these properties would reduce to moderate to substantial adverse, as mitigation planting would screen views from ground floor windows*". The primary visible elements of the scheme remain the proposed housing and SuDs (being in closest proximity). Residents may have oblique views of the north-west developed edge, comprising housing at a slightly greater distance and the introduction of the WwTW and a relocated SuDs basin.

4.5.29 The presence of development within these views would remain comparable, however, a greater number of residents may experience Very Substantial Adverse effects rather than Substantial Adverse during construction and on completion as a result of the nature of change to the built form visible in views from residential to industrial.

However, the effects are considered to reduce to Moderate to Substantial Adverse in the long term (as previously reported) once mitigation planting establishes.

4.6 Conclusions

4.6.1 The Kingsnorth Green residential development has been reviewed and reassessed to incorporate and reflect any change to the anticipated effects upon the character of the landscape or identified visual receptors.

4.6.2 Following the introduction of the proposed WwTW there would be very limited change to the scheme. In general, the built development footprint would remain comparable as the WwTW would be situated where residential development was previously proposed. The proposed sustainable drainage features have been altered slightly in terms of position and design, however, they remain in the same location with the scheme and thus would cause any material alteration to the reported effects.

4.6.3 There are very few visual receptors considered potentially subject to change to their views as a result of the alterations to the Proposed Development. These comprise those along Pound Lane passing the Site to the north (both vehicular and recreational), residents along Pound Lane to the north-east, and footpath users at mid-distance to the north-west. It is considered that the introduction of the WwTW would result in an increase in residual effects upon PRoW and road receptors passing the Site along Pound Lane. Consequently, further to originally reported impacts in 2015 and 2020 there would be significant residual effects upon these PRoW users, although in general the localised change to the nature of the scheme would otherwise not result in any new or different effects upon the identified receptors with views towards the revised development elements.

5 ECOLOGY

5.1 Introduction

5.1.1 This Chapter considers the likely significant effects resulting from the proposed inclusion of a Waste Water Treatment Works (WwTW) in the north-west of Area 1, at the Kingsnorth Green Site ('the Site') in terms of Ecology. It provides an update on the likely significant effects of the overall Proposed Development on Ecology, in consideration of the proposed amendments to the 2015 application. This chapter should be read in conjunction with the 2015 ES and the 2017 and 2020 Addendums.

5.1.2 This chapter considers the effects relating to the construction and operation of the WwTW. Nitrogen deposition has been considered for the Proposed Development in a separate nutrient neutrality assessment.

5.2 Methodology – Impacts Assessment

5.2.1 The impact assessment methodology followed in this chapter is broadly in keeping with the methodology set out in chapter 4.3 of the 2017 ES Addendum, taking into consideration any updates in respect of the Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2019). For instance, considerations such as the valuation of the receptors has been adequately covered in the 2017 Addendum and is still considered relevant. Therefore, the 2017 methodology is not repeated verbatim in this Addendum.

5.2.2 Within this Addendum the construction of a WwTW is to be considered. The WwTW lies within the development boundary on land proposed for built development in the 2017 Addendum.

5.2.3 For the WwTW the effects of construction and operation will be generally similar if not less intrusive than the proposed housing that it replaces. Once constructed the WwTW is designed to be remotely managed, that is there should be fewer visits with little or no need for artificial lighting. The potential effect of noise generated by the Site will be considered.

5.2.4 Given the likely limited impact of the updated proposals, this chapter will focus on:

- Identifying receptors that are likely to be both sensitive and exposed to effects specifically associated with the updated proposals (i.e. the inclusion of the WwTW in the scheme design);

- Identifying the magnitude of impact that any effects associated with the updated proposals will have on those receptors (where these impacts are over and above impacts already assessed within the 2015 ES and the 2017 and 2020 Addendums).
- Validating the assessment of the significance of the effects arising from potential impacts as presented in the 2017 Addendum, or otherwise, presenting an update to the assessment.

5.3 Current baseline

5.3.1 Given the limited extent of the new proposals and the continuous management as arable land, it is considered appropriate to use the existing survey data to inform the current baseline. Therefore, for the purpose of this Addendum, the baseline is as described in the 2015 ES and the 2017 and 2020 Addendums.

5.4 Receptors Scoped into the Assessment

5.4.1 Given the nature of the updated proposals, habitats within the footprint of the WwTW and all individual species considered in detail within the 2017 Addendum are scoped into the assessment. Note, the 2017 Addendum considers receptors that are relevant to this assessment whereas the 2020 Addendum focuses on cumulative impacts in relation to other developments in the area. The 2017 Addendum is more explicitly relevant to this Addendum than the 2020 Addendum.

5.5 Receptors Scoped out of the Assessment

5.5.1 Given the nature of the updated proposals, designated sites are scoped out of the assessment – there is not pathway for any effect to occur that could be attributed solely to the construction and operation of the WwTW, except in respect of Stodmarsh SSSI, which will be considered under a separate assessment.

5.5.2 Habitats outwith the construction/operational footprint of the WwTW are excluded from the assessment. Effects on these habitats are adequately covered by the 2017 Addendum and these habitats will not be subject to additional or different effects associated with the construction/operation of the WwTW.

5.6 Evaluation of Baseline Features

5.6.1 This section establishes the value of receptors scoped into the assessment, though for consistency, this is broadly as presented in the 2017 addendum.

Table 5.1 Evaluation of Baseline Conditions

Ecological Receptor	Evaluation Rationale	Value of receptor
	Habitats	
None	The WwTW footprint is on arable land which is common and widespread and of negligible ecological value. Therefore habitats have not been considered further.	**Negligible**
	Species	
Badger	Badgers are a common and widespread species in the UK (estimated to be 288,000 individuals), but are protected from persecution. Based on the common status of badger they are of zone of influence (including the site) nature conservation value.	**Zone of influence (including site)**
Bats	The majority of the Site is arable land, offering limited foraging/commuting potential. Linear features associated within field margins, such as hedgerows, ditches, woodland and semi-improved grassland provide foraging and commuting potential. Several bat species were recorded during the surveys, including common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, noctule, Leisler's, and Myotis spp. Common pipistrelle and soprano pipistrelle were the most frequently recorded foraging and commuting a cross the site, where as noctule, Leisler's, Myotis spp. and Nathusius' pipistrelle were recorded in low numbers (commuting only) and it is anticipated the Site does not form part of their main foraging habitat. The current UK population of the bat species recorded are: 2,430,000 of common pipistrelle, 1,300,000 of soprano pipistrelle; 16, 000 of Nathusius' pipistrelle and 50,000 of noctule, of which 45,000 are within England. Leisler's are widespread throughout the UK; within the south-east of England they are considered to be scarce and known distributions are patchy. Nathusius' pipistrelle is widely distributed within the south-east but recorded in low numbers. No roosts were confirmed within the site; however, 115 trees have the potential to support roosting bats, though none of these were in the vicinity of the WwTW. Therefore, based on the availability of habitat present within the wider landscape, the current UK population estimates and the limited foraging potential within the site (except for *Pipistrelle* spp.), it is anticipated that bats are of local nature conservation value.	**Local**
Birds (breeding)	The Site supports several notable and protected species of breeding bird that are associated predominantly with hedgerow habitats as well as arable and woodland habitats. The Site was found to be supporting six of the twelve declining farmland bird species from the BTO and RSPB *Farmland Bird Index.*	**District**

Table 5.1 Evaluation of Baseline Conditions		
Ecological Receptor	**Evaluation Rationale**	**Value of receptor**
	Estimated UK populations are as follows; bullfinch 220,000 pairs, cuckoo 16,000 pairs, dunnock 2,500,000 territories, herring gull 140,000 pairs, house sparrow 5,300,000 pairs, kestrel 46,000 pairs, linnet 430,000 territories, mallard 61,000-146,000 pairs, meadow pipit 2,000,000 territories, reed bunting 250,000 territories, skylark 1,500,000 territories, song thrush 1,144,000 territories, starling 804,000 territories, swallow 860,000 territories, yellowhammer 710,000 territories, tawny owl *Strix aluco* 50,000 pairs and mistle thrush *Turdus viscivorus* 160,000 pairs. Based upon the criteria provided by Fuller (1980), which assesses the value of the species assemblage (i.e. the number of different species present) on the site, the breeding bird assemblage is considered to be county importance. However, the number of species recorded within the Site that are of conservation value (those listed as Schedule 1, BoCC, s.41 NERC, LBAP & Red List, omitting category C species) are of local importance in accordance with Fuller (1980). Additionally, consideration of the assemblage of species present judged against the Kent Local Wildlife Site criteria revealed that there are not sufficient numbers of Kent red listed species present within the Site to be of county value for Kent. Therefore, the Site is considered to be of district nature conservation value, supporting a range of breeding bird species associated with farmland habitats incorporating species typical of hedgerows, small woodlands and arable crops.	
Birds (wintering)	The Site supports several notable species of bird none of which were found in significant numbers. Two Schedule 1 species were also recorded within the Site neither of which will use the Site for breeding. Wintering birds recorded within the Site are associated with arable, woodland and hedgerow habitats. The Site was found to be supporting two of the twelve declining farmland bird species from the BTO and RSPB *Farmland Bird Index.* Based upon the criteria provided by Fuller (1980), the wintering bird assemblage is considered to be of local significance, supporting a range of wintering bird species associated with farmland and woodland habitats and incorporating species typical of arable crops, hedgerows, small woods and shelterbelts. Based on the number of birds recorded compared to their UK estimates and the availability of similar available habitat surrounding the site, wintering birds are considered to be of local nature conservation value.	**Local**
Dormouse	Several habitats within the site, namely species rich and species poor hedges and ancient woodland blocks are suitable to support dormouse. Although these habitats are limited to field margins and the periphery of the site, evidence of dormouse have been recorded in all areas within the site. Dormouse numbers have halved in England in the last 100 years but Kent remains to be one of the strongholds with the highest recorded densities. Because of this and the known presence of dormouse within the Site and surrounding landscape, dormouse is of county nature conservation value.	**County**
Great crested newt	Local records confirmed the presence of great crested newt (GCN) within 2km of the Site (89 individual adult records). Surveys confirmed the presence of GCN in 14 of the waterbodies surveyed, five of which are located within the site. GCN are protected under the Wildlife and Countryside Act 1981 (WCA) and the Habitat Regulations 2017 and are listed under s.41 NERC and LBAP. GCN are common throughout much	**District**

Table 5.1 Evaluation of Baseline Conditions		
Ecological Receptor	**Evaluation Rationale**	**Value of receptor**
	of England, including the south-east and it is estimated the 400,000 individual GCN are present within the UK in over 18,000 breeding sites. The Site provides suitable breeding, foraging, commuting and hibernating habitats for GCN. Based on the common status of GCN and the similar suitable breeding and foraging habitat within the wider landscape, GCN are likely to be of district nature conservation value.	
Reptiles	Hedgerow, grassland, scrub and waterbodies within the Site provide suitable habitat for a number of common reptile species, including common lizard, grass snake and slow worm. The Site supports three species of reptiles and an exceptional population of slow worm that when compared against Local Wildlife Site Criteria for Kent, would be considered of county importance. However, habitats present within the Site that are suitable to support reptile species are limited in extent and are largely concentrated to the peripheries of arable fields. All of the reptile species recorded within the Site are common and widespread across the south-east of England. Although protected, these species are amongst the commonest of reptile species and are limited to suitable habitat across a largely arable site. Based on this and the availability of more suitable habitat within the wider landscape, reptiles are considered to be of county nature conservation value.	**County**
Water vole	Desk study records and survey results confirm the presence of water vole within the Site and the surrounding landscape. Water vole are listed under s.41 NERC and LBAP and are afforded protection under the WCA, 1981. Populations within Kent are within the highest 3 within mainland Britain. Habitats within the Site suitable to support water vole include ponds and ditches. Based on the presence of water vole within the Site and the importance of the Kent population, water voles within the Site are likely to be of district nature conservation value.	**District**

5.7 Construction of the WwTW - Assessment of Effects

Badger

5.7.1 Baseline data suggests there are no badger setts within 30 m of the likely construction footprint of the WwTW (the 2017 ES indicates the nearest setts are approximately 150 m away). Therefore, the construction of the WwTW will have no impact on any setts.

5.7.2 In considering the construction of the scheme as a whole, including for construction of the WwTW, the conclusions of the 2017 Addendum are considered to remain valid, i.e. overall, construction impacts will result in a minor negative impact on badger which is not significant in the absence of mitigation.

Bats

5.7.3 Construction methods (e.g. over-night flood lighting) used during the construction of the WwTW that would result in indirect impacts have already been assessed by the 2017 Addendum – and so indirect impacts are not re-assessed in respect of bats.

5.7.4 The construction of the WwTW will not require the removal of any habitat or feature with suitability to support roosting bats, and so there is no direct pathway for an impact on roosting bats to occur.

5.7.5 In considering the construction of the scheme as a whole, including for construction of the WwTW, the conclusions of the 2017 Addendum are considered to remain valid i.e. overall, construction will result in negligible (not significant) effects on bats in the absence of mitigation.

Birds

5.7.6 The construction methods (e.g. increased noise/disturbance of nesting habitat) used during the construction of the WwTW that would result in indirect impacts have already been assessed by the 2017 Addendum – and so indirect impacts are not re-assessed in respect of breeding birds in the absence of mitigation.

5.7.7 In considering the construction of the scheme as a whole, including for construction of the WwTW, the conclusions of the 2017 Addendum are considered to remain valid i.e. overall, construction will result in a minor (not significant) effect on breeding birds and a negligible (not significant) effect on wintering birds in the absence of mitigation.

Dormouse

5.7.8 The construction of the WwTW will have no impact on the habitats used by dormouse at the site. Therefore, the construction of the WwTW will result in no additional effect on dormouse over and above those described in the 2017 Addendum.

5.7.9 In considering the construction of the scheme as a whole, including for construction of the WwTW, the conclusions of the 2017 Addendum are considered to remain valid i.e. overall, construction will result in a moderate (significant) effect on dormouse in the absence of mitigation.

Great Crested Newt

5.7.10 The construction footprint of the WwTW is outside the 500 m buffers from known (or assumed) GCN breeding ponds. Furthermore, the WwTW lies within the development area for the 2017 Addendum, and all the waterbodies within 500 m were assessed and no evidence of GCNs found.

5.7.11 In considering the construction of the scheme as a whole, including of the WwTW, the conclusions of the 2017 Addendum are considered to remain valid i.e. overall, construction will result in a moderate (significant) effect on GCN in the absence of mitigation.

Reptiles

5.7.12 The footprint of the WwTW lies completely within arable land which is of negligible value for reptiles. Furthermore the footprint of the WwTW lies within the development area for the 2017 Addendum, therefore there will be no change in the magnitude of impact on reptiles.

5.7.13 In considering the construction of the scheme as a whole, including for construction of the WwTW, the conclusions of the 2017 Addendum are considered to remain valid i.e. overall, construction will result in a moderate (significant) effect on reptiles in the absence of mitigation.

Water vole

5.7.14 The construction of the WwTW will have no impact on the habitats used by water vole at the site; no water voles were found in Area 1. Therefore, the construction of the WwTW will result in no additional impacts on water vole over and above those described in the 2017 Addendum.

5.7.15 In considering the construction of the scheme as a whole, including for construction of the WwTW, the conclusions of the 2017 Addendum are considered to remain valid i.e. overall, construction will result in a moderate (significant) effect on water vole in the absence of mitigation.

5.8 Operation of the WwTW - Assessment of Effects

Badger

5.8.1 Baseline data suggests there are no badger setts within 30m of the likely operational footprint of the WwTW (the 2017 ES indicates the nearest setts are approximately 150 m away). Therefore, the operation of the WwTW will have no impact on any setts.

5.8.2 In considering the operation of the scheme as a whole, including operation of the WwTW, the conclusions of the 2017 Addendum are considered to remain valid, i.e. overall, operation impacts will result in a minor (not significant) effect on badger in the absence of mitigation.

Bats

5.8.3 The indirect impacts (e.g. exclusion from habitats through increased noise/lighting) occurring as a result of the operation of the WwTW have already been assessed by the 2017 Addendum – and so potential indirect impacts are not re-assessed in respect of bats.

5.8.4 In considering the operation of the scheme as a whole, including for operation of the operation of the WwTW, the conclusions of the 2017 Addendum are considered to remain valid i.e. overall, operation of the scheme will result in a minor (not significant) effect on bats in the absence of mitigation.

Birds

5.8.5 During the operation of the WwTW there may be some additional noise created by machinery. Operational noise may disturb birds, in particular overwintering birds which will then fly off and use energy resources finding alternative foraging grounds. A review of the noise impact assessment for a similar site[1] indicated the loudest noise produced from machinery would be in the range of 75-85 dB. Assuming a peak of 85

[1] ACCON UK Limited (2021) Hoplands, Hersden: Noise Impact Assessment for a Wastewater Treatment Works

dB it is likely the impact on birds will be insignificant (i.e. there will be no detectable change in the birds' behaviour; they are not scared away) from between 10-20 m^2.

5.8.6 There was no particular land noted in Area 1 as being important for wading birds (although a notable number of black-headed gulls were noted flying over this area). However the WwTW is over 20 m from the nearest hedgerows. As hedgerows were where the majority of breeding birds noted in Area 1 were recorded, it is expected the impact of noise on overwintering and breeding birds will not change as a result of the WwTW operation.

5.8.7 The operation of the WwTW will not result in any additional indirect impacts (e.g. increased noise/disturbance of nesting habitat) not already assessed by the 2017 Addendum – and so with the exception of noise from the WwTW (see above) indirect impacts are not re-assessed in respect of breeding and wintering birds.

5.8.8 In considering the operation of the scheme as a whole, including for operation of the WwTW, the conclusions of the 2017 Addendum are considered to remain valid i.e. overall, operation will result in a minor (not significant) effect on breeding birds and a negligible (not significant) effect on wintering birds in the absence of mitigation.

Dormouse

5.8.9 The operation of the WwTW will have no impact on the habitats used by dormouse at the site. Therefore, the operation of the WwTW will result in no additional effect on dormouse over and above those described in the 2017 Addendum.

5.8.10 In considering the operation of the scheme as a whole, including of the WwTW, the conclusions of the 2017 Addendum are considered to remain valid i.e. overall, operation will result in a moderate (significant) effect on dormouse in the absence of mitigation.

Great Crested Newt

5.8.11 The WwTW lies outside of any 500 m buffer around GCN breeding ponds. During the operation of the WwTW it is not anticipated that it would have any impacts on GCN over and above those considered by the 2017 Addendum for the wider scheme.

5.8.12 In considering the operation of the scheme as a whole, including of the WwTW, the conclusions of the 2017 Addendum are considered to remain valid i.e. overall,

[2] Cutts, N. Hemingway, K. and Spencer, J. (2013) Waterbird Disturbance Mitigation Toolkit Informing Estuarine Planning & Construction Projects v3.2

operation will result in a moderate (significant) effect on GCN in the absence of mitigation.

Reptiles

5.8.13 During the operational phase of the WwTW of there will be no additional impacts (e.g. collision with vehicles and increased predation) over the 2017 Addendum for the wider scheme. Therefore, it is considered that, in line with the 2017 Addendum, the combined effect of the operation of the WwTW and the wider scheme will result in a moderate (significant) effect on reptiles in the absence of mitigation.

Water vole

5.8.14 The operation of the WwTW will have no impact on the habitats used by water vole at the site. Therefore, the operation of the WwTW will result in no additional effect on water vole over and above those described in the 2017 Addendum.

5.8.15 In considering the construction of the scheme as a whole, including for operation of the WwTW, the conclusions of the 2017 Addendum are considered to remain valid i.e. overall, operation will result in a moderate (significant) effect on water vole in the absence of mitigation.

5.9 Mitigation

5.9.1 Given that the updated proposals are considered to result in no measurable impacts over and above those considered in the 2017 Addendum, it is considered the environmental measures designed to reduce or avoid significant effects as set out in Section 4.5 of the 2017 Addendum remain valid and are therefore not repeated in this Addendum.

5.9.2 With the implementation of the environmental measures, there is predicted to be negligible (not significant) effects, but minor (not significant) beneficial effects (with the exception of poor semi-improved grassland) on all receptors considered in this chapter.

5.10 Cumulative Impacts

5.10.1 The 2020 Addendum considered cumulative impacts. The updated proposals are not considered to add to the existing effects, and so the assessment of cumulative impacts is not repeated in this chapter.

5.11 Summary

5.11.1 A summary of the assessment of the scheme as a whole, as set out in the 2017 Addendum, and in consideration of the inclusion of the WwTW in the scheme design, is presented in Table 5.2.

5.11.2 With environmental measures in place, no likely significant effects are considered to arise from the impacts associated with the proposals. As stated in the 2017 Addendum, environmental measures will likely lead to an overall slight increase in the ecological value and diversity of habitats within the site. As a consequence, the assessment establishes that the proposals for the Site will comply with planning policy and relevant legislation.

Table 4.6 – Summary of Impacts and Mitigation

Ecological Receptor	Significance of Impact without Mitigation during Construction and Operation	Mitigation Measures	Impact following inclusion of mitigation	Significance of effects of residual Impact (after mitigation)
Designated Sites	Considered not to be significant during construction or operation of the site, with the exclusion of Stodmarsh SSSI, which will be considered by way of a Net Nutrient Neutrality Assessment.	None required as part of this chapter. Additional consideration will be provided by way of a Net Nutrient Neutrality Assessment.	**N/A**	N/A
General habitats (including Semi-improved neutral grassland)	Considered not to be significant during construction or operation of the site.	Retention of ecological valuable habitats during site design and creation of open green spaces and associated planting.	**Negligible**	Likely minor beneficial effect following mitigation.
Habitats (broad-leaved woodland)	Considered not to be significant during construction of the site; but significant during the operation of the site.	Retention of woodland habitat with a permanent 15m buffer forms part of the scheme. As mitigation, this will not be managed but will be allowed to establish into semi-natural habitat. Localised works to the footpath in the woodland to manage increased foot fall during the operational phase.	**Negligible**	Likely minor beneficial effect following mitigation.
Badger	Considered not to be significant during construction or operation of the site.	Buffer zones around known badger setts, planting of open green spaces and signs along roadways. Mitigation to adhere to relevant legislation.	**Negligible**	Likely minor beneficial effect following mitigation.

Table 4.6 – Summary of Impacts and Mitigation				
Ecological Receptor	**Significance of Impact without Mitigation during Construction and Operation**	**Mitigation Measures**	**Impact following inclusion of mitigation**	**Significance of effects of residual Impact (after mitigation)**
Great Crested Newt	Considered to be significant during construction and operation of the site.	Capture and exclusion of GCN from the site. Creation of receptor sites. Enhancement of open green spaces for foraging and hibernating newts. SuDS to establish naturally to become suitable for newts. Retention of all known breeding ponds.	**Negligible**	Likely minor beneficial effect following mitigation.
Water Vole	Considered to be significant during construction and operation of the site.	Retention of known water vole habitats with suitable buffers. Displacement of water vole at existing culvert. Enhancement of less optimal existing habitats where water vole has not been recorded. Use of box culverts with ledges and planting. Creation of SuDS, designed with water vole in mind. Management of suitable habitats to favour water voles and reduce predation.	**Negligible**	Likely minor beneficial effect following mitigation.
Bats	Considered not to be significant during construction or operation of the site.	Retention of foraging and commuting routes. Sensitive lighting scheme. Planting of open green spaces to enhance foraging and commuting within the site.	**Negligible**	Likely minor beneficial effect following mitigation.
Birds	Considered not to be significant during construction and operation of the site.	Retention of nesting and foraging habitats. Planting of open green spaces to encourage farmland bird species.	**Negligible**	Likely minor beneficial effect following mitigation.
Reptiles	Considered to be significant during construction and operation of the site.	Reptiles will be trapped and relocated during mitigation for GCN. Inclusion of a site-specific reptile mitigation strategy for areas not covered under GCN mitigation. Retention of commuting and foraging habitats within the site. Planting of open green space, SuDS and plantation woodland to encourage dispersal and provide additional habitat for reptiles.	**Negligible**	Likely minor beneficial effect following mitigation.
Dormouse	Considered to be significant during construction and operation of the site.	Buffer zones surrounding hedgerow habitats. Timing and ecological supervision for hedgerow removal with use of hand tools. Artificial connectivity measures implemented for road	**Negligible**	Likely minor beneficial effect following mitigation.

Table 4.6 – Summary of Impacts and Mitigation				
Ecological Receptor	**Significance of Impact without Mitigation during Construction and Operation**	**Mitigation Measures**	**Impact following inclusion of mitigation**	**Significance of effects of residual Impact (after mitigation)**
		crossings. Sensitive management of hedgerows. Planting of a woodland block and enhancement of open green spaces.		

6 ARCHAEOLOGY AND HERITAGE

6.1 Introduction

6.1.1 This Chapter considers the likely significant effects resulting from the proposed inclusion of a Waste Water Treatment Works (WwTW) in the north-west of Area 1 at the Site in terms of archaeology and heritage. It provides an update on the likely significant effects of the overall Proposed Development on buried archaeological remains as a consequence of ground disturbance and on the significance of nearby heritage assets as a consequence of changes within their settings.

6.1.2 This Chapter is not intended to be a standalone assessment. It should be read in conjunction with the following documents:

- Geophysical surveys submitted with the original 2015 Environmental Statement (Wardell Armstrong 2014 & 15);
- An Archaeological Evaluation Report referencing targeted trial trenching within the Site (Oxford Archaeology East 2017);
- An Archaeological Desk Based Assessment (Wardell Armstrong 2018). This was prepared in 2018 to include the results of the archaeological trial trenching evaluation (Oxford Archaeology) and supersedes the 2015 Environmental Statement Chapter;
- A Heritage Statement (Wardell Armstrong 2017) which supersedes the 2015 Environmental Statement Chapter;
- A Historic Landscape Assessment (Wardell Armstrong 2017);
- A Pill Box Statement (Wardell Armstrong 2018); and
- Environment Statement Addendum (Wardell Armstrong 2020).

6.1.3 Furthermore, reference should also be made to the front end of this ES Addendum (Chapters 1 and 2), as well as the final summary chapter (Chapter 11).

6.2 Scope

6.2.1 This assessment considers the potential for additional effects arising from the proposed WwTW within Area 1 of the Kingsnorth site. Any additional effects (if identified) would be additional to those identified within the Archaeological Desk Based Assessment (Wardell Armstrong 2018) and the Heritage Statement (Wardell Armstrong 2017).

6.2.2 **Archaeology:** With regards to potential direct impact to buried archaeological remains, a Desk Based Assessment was prepared in 2018 (Wardell Armstrong 2018). This referenced archaeological evaluation of the Site comprising geophysical survey undertaken in 2014 and 2015 (Wardell Armstrong 2014 & 2015) and trial trenching undertaken in 2017 (Oxford Archaeology East 2017).

6.2.3 The proposed WwTW within Area 1 is located within the previous footprint of development and is therefore considered as having been assessed for general ground disturbance by the previous reports, namely the Archaeological Desk Based Assessment (2018).

6.2.4 **Heritage**: The proposed WwTW within Area 1 is considered to have the potential to cause additional impacts to heritage assets through changes within their setting. This is due to the consideration of potential noise and odour impacts not considered by the 2018 Heritage Statement. Addendum statements will be made in respect to the 2017 Heritage Statement with specific regard to Listed Buildings located within the vicinity of the WwTW.

6.2.5 **Approach**

6.2.6 **Archaeology:** A review of direct impacts to buried archaeological remains within the footprint of the WwTW will be gauged through a review of the proposed location of the works and the results of the 2014/15 and 2017 Archaeological Evaluations of the Site and an updated search of the Historic Environment Record (HER).

6.2.7 **Heritage:** A review of in-direct impacts to the significance of Listed Buildings in the vicinity of the proposed WwTW will be made with due regard to potential visual, noise and odour changes. Reference will be made to Chapters 8 (Noise) and 9 (Air Quality).

6.3 Assessment

Planning Policy and Legislation

6.3.1 Since 2017/2018, the revised National Planning Policy Framework (NPPF) was published in 2021. With regards to the assessment of impact to buried archaeological remains and the consideration of impacts to the significance of designated heritage assets, the revised NPPF has not altered.

6.3.2 Since 2017/2018 the 'Ashford Local Plan 2030' was adopted in February 2019. The Proposals Map shows the wider Kingsnorth Green proposals broadly according with 'indicative development areas' on the proposals map. The proposed WwTW for Area

1 and additional area of housing are located within the 'indicative development areas' and 'site outline'.

6.3.3 Relevant policy in respect to Archaeology and Heritage is contained in policies ENV15 (Archaeology) and ENV13 (Conservation and Enhancement of Heritage Assets).

Baseline Conditions

6.3.4 The following baseline conditions are referenced with specific regard to the location of the WwTW where this is pertinent to inform on the potential for additional impacts to potential archaeological remains through additional ground disturbance.

6.3.5 Baseline conditions are also referenced with specific regard to the locations of the proposed WwTW where there is the potential for additional impacts to the significance of Listed Buildings through changes within their setting.

6.3.6 **Archaeology:** Re-consultation with the Kent HER undertaken in August 2022, did not highlight the presence of any additional archaeological remains within the footprint of the proposed WwTW.

6.3.7 A review of the proposed WwTW in respect to the geophysical survey (2015) shows that the proposals do not extend across probable archaeological anomalies. The area was investigated by trial trenching undertaken by Oxford Archaeology East in 2017 with Trench 35 located within the southern extent of the proposed WwTW. Trench 35 was orientated north-south and contained a possible oven, made from two discreet features, one which was determined to be a stokehole and the other a chamber. A sample of the charcoal taken from the fill provided a radiocarbon date of 168 cal BC – 3 cal BC which placed it in the late Iron Age period. It was concluded the oven was unlikely to be an isolated feature and may suggest nearby activity related to this period. Iron Age and Roman activity has been recorded at Westhawk Farm, 500m north-west of Area 1.

6.3.8 **Heritage:** A review of heritage assets presented in the Heritage Statement (Wardell Armstrong 2017) and a review of up-to-date datasets held by Historic England confirms the presence of the following Listed Buildings in proximity to the proposed WwTW.

Waste Water Treatment Works

6.3.9 No Listed Buildings are located within the immediate vicinity of the proposed WwTW. The nearest Listed Buildings comprise of The Queens Head Public House (1071466), Pound Green (1320408) and Pound Farmhouse (1320407). They are clustered,

approximately, 215m, 265m and 290m east of the WwTW, respectively and 60m, 85m and 65m north-east of Area 1, respectively.

6.3.10 *Queens Head Public House*: The asset is prominent on the Kingsnorth crossroads within a small nucleus of historic buildings. The area to the rear of the asset which is utilised as the carpark and beer garden is reflective of the land recorded as being occupied by the public house at the time of Tithe. The asset's prominent crossroad location and its retained rear use of historically associated land are important aspects of setting which were previously assessed as being unaffected by the proposals.

6.3.11 The proposed WwTW would be located 215m east beyond an intervening motorbike shop and a residential property and within an area of proposed housing development.

6.3.12 *Pound Green*: The asset is located adjacent to the Kingsnorth crossroads in proximity to other eighteenth century buildings comprising the Queen's Head Public House and Pound Farmhouse. This reflects the historic nucleus of buildings which occupied the crossroads and allows an appreciation of the origins of the asset. The previous assessment of the building and the proposals concluded that there would be no impact to the building as a consequence of change within is setting.

6.3.13 The WWTW would be located 265m east beyond an intervening motorbike shop and a residential property within an area previously shown as proposed residential development.

6.3.14 *Pound Farmhouse*: The asset is located adjacent to the Kingsnorth crossroads in proximity to other eighteenth century buildings comprising the Queen's Head Public House and Pound Green. This reflects the historic nucleus of buildings which occupied the crossroads and allows an appreciation of the origins of the asset. The previous assessment of the building and the proposals concluded that there would be no impact to the building as a consequence of change within it setting.

6.3.15 The proposed WwTW would be located 290m east beyond an intervening motorbike shop and a residential property within an area previously shown as proposed residential development.

6.4 Assessment of Effects, Mitigation and Residual Effects

Assessment of Effects

6.4.1 The Proposed Development has the potential to result in both direct and indirect impacts upon heritage assets of an archaeological or built heritage nature.

Archaeology

6.4.2 Direct impacts would arise as a result of ground disturbance. The 2018 Archaeological Desk Based Assessment determined that potential direct impacts to buried archaeological remains would be of up to moderate adverse effect across the Site.

6.4.3 The proposed WwTW is located within an area which had identified archaeological remains through the presence of a late Iron Age oven. There is potential for further remains within the vicinity, the extent and typology of which is unknown. As an isolated asset, the oven is of low significance.

6.4.4 In summary, the potential overall impact to archaeological remains in general is not anticipated to exceed that which has already been stated for the proposals as a whole. The impact of the proposed development would continue to be of up to moderate adverse effect. No additional archaeological impacts are identified as part of this Addendum.

Heritage

6.4.5 In respect to the Listed Buildings identified as being potentially affected by change in respect to the proposed WwTW, the 2017 Heritage Statement identified the following impacts as part of the previous scheme:

- The Queens Head Public House (1071466) – neutral (no harm)
- Pound Green (1320408) – neutral (no harm)
- Pound Farmhouse (1320407) – neutral (no harm)

6.4.6 The following text considers the potential for the above referenced impacts to be altered as a consequence of potential visual change, noise change and odour change associated with the WwTW.

6.4.7 With regard to the potential for additional visual impact, the proposed WwTW would occupy a compact, enclosed rectangular area containing six, sealed cylindrical treatment tanks of various scale, the largest extending to 6.33m in height which are to be arranged along the west and north boundary of the works. Three, small rectangular, detached single storey structures would be accommodated to the east to house the kiosk, office and storage area and the generator. A central access and road with adequate turning and manoeuvring space will also be provided. Mast mounted CCTV units are also proposed to observe critical locations / functions. The proposed WwTW area will be enclosed by palisade style secure fencing.

6.4.8 The Parameters Plans (Appendix 1.1) detail the WwTW to be set back within the Site from the north boundary with Pound Lane with vegetative landscaping to be included along the access road and around the north and east perimeter of the proposed works. This is addition to the landscaped boundary to the west of Area 1.

6.4.9 Due to the limited visual intrusion appreciable from the Listed Buildings or in views of the Listed Buildings it is anticipated that the potential visual changes would cause no re-consideration of the impacts to the significance of the Listed Buildings referenced above.

6.4.10 With regard to the potential for changes to noise, the Noise Chapter to this Addendum states that it is anticipated that WwTW would likely operate 24hrs a day. Without sufficient data to assess the level of noise impact at this time a 'noise limit' for future operations, to be maintained at the boundary of the receptors has been assumed and the broadly applied worst case potential impact is referenced at minor adverse to negligible assuming appropriate mitigation measures are secured as part of the reserved matters to ensure that noise would be below background sound levels at existing and proposed receptors.

6.4.11 On these grounds it is possible that the Listed Buildings referenced above could experience a small noise impact within their settings which could cause an impact of up to slight adverse effect on their enjoyment and therefore an appreciation of their architectural and historic significance. However, in lieu of further information, it is stressed that this is presented as a worst-case impact with ambient noise levels associated with traffic noise likely to reduce the level of impact appreciable or remove it.

6.4.12 With reference to potential impact through changes in odour within the vicinity of the WwTW, Chapter 9 of this Addendum advises that existing sensitive receptor (nearby residential properties) is predicted to be affected by odours above the benchmark criterion and finds that the effect of odour from the proposed WwTW on existing residential receptors is considered to be negligible. In accordance with IAQM guidance, this correlates to an overall **'not significant'** effect.

6.4.13 It is therefore anticipated that the WwTW would not be regarded as having the potential to cause harm to the enjoyment and appreciation of the Listed Buildings, therefore no additional impact as a consequence of odour is anticipated.

6.4.14 In summary, minor potential additional heritage impacts (as a worst-case scenario) are identified as part of this Addendum. However, it is anticipated that these could be

removed through appropriate mitigation measures (see below) such that impacts would remain consistent with those previously identified.

6.4.15 ***Mitigation***

Archaeology

6.4.16 With reference to the conclusions of the 2018 Archaeological Desk Based Assessment it is anticipated that further work could be delayed until the mitigation stage, as a condition or reserved matter to outline consent. The scope and extent of further fieldwork within the area of the WwTW and the additional housing would need to be established in consultation with the Senior Archaeological Officer for Kent County Council.

6.4.17 Heritage

6.4.18 The Noise Chapter suggests that a 'noise limit' should be established at the Reserved Matters Stage to mitigate any harm to sensitive receptors. It is stated that noise sources should be limited so as not to exceed the background noise level of receptors and that any tonal, impulsive or intermittent sound characteristics should be designed out or mitigated as part of the detailed design. The potential for successful mitigation would remove the additional impacts identified above.

Residual Effect

Archaeology

6.4.19 The loss of buried archaeological remains due to the Proposed Development would be fully mitigated through the implementation of a programme of archaeological fieldwork as a condition to consent. Whilst the residual impact to the buried resource would continue to be up to moderate adverse, the preservation by record of the archaeology would contribute to the archaeological understanding of the area.

Heritage

6.4.20 On the assumption that suitable mitigation could be implemented to reduce any potential noise effects it is anticipated that residual effects would be as per the impacts presented within the Heritage Statement (Wardell Armstrong 2017).

6.4.21 These impacts are concluded to be neutral (no harm).

Assessment of Cumulative Effects

6.4.22 Cumulative effects were considered as part of an Environmental Addendum submitted in April 2020. No further effects are anticipated. Effects were summarised

as follows: There would be a cumulative physical impact to buried remains however, this would be offset by a cumulative beneficial impact in respect to the preserved record, it being enhanced by the recording of new finds and features providing input into the local and regional knowledge baseline; any residual cumulative impact would not be significant. No cumulative impacts in respect to built heritage are anticipated. The cumulative impact to the wider historic landscape is not considered to be significant due to the relative lack of importance of the landscape present within the Kingsnorth boundary.

6.5 Conclusion

6.5.1 This chapter of the Addendum has assessed the potential impact to buried archaeological remains as a consequence of ground disturbance and the potential impact to heritage assets within the vicinity of the Site through potential change within their setting.

6.5.2 No additional residual impacts have been identified as part of this Addendum which has considered the impact of the proposed Waste water Treatment Works within the northwest corner of Area 1 and consolidated the conclusions of the Archaeological Desk Based Assessment (Wardell Armstrong 2018) and Heritage Statement (Wardell Armstrong 2017) submitted in support of the wider proposals.

6.5.3 Previous conclusions on the potential impact to buried archaeological remains have been confirmed at no greater than moderate adverse. The Addendum assessment of the proposed WwTW alongside the Archaeological Desk Based Assessment submitted in 2018, which included the results of geophysical survey and targeted trial trenching, has fulfilled the predetermination requirements of the NPPF and local plan policy ENV15, further archaeological fieldwork, if required, able to be undertaken as a condition to consent.

6.5.4 Additional impacts to the significance of Listed Buildings through potential noise and odour effects associated with the proposed WwTW have been considered and, subject to appropriate mitigation, are judged to result in no harm to the significance of the Listed Buildings. The statements of significance included in the submitted Heritage Statement (2017) and the assessment of impact completed by this Addendum are in full accordance with the requirements of Local Plan policy ENV13 such that any less than substantial harm can be considered against the public benefits to be offered by the scheme. Benefits would comprise a 30% affordable housing provision and a financial contribution to deliver, improve, extend or refurbish existing or planned local recreational, educational and community facilities, as appropriate.

7 WATER RESOURCES

7.1.1 This addendum is not a standalone document and should be read in conjunction with the 2015 ES, 2017 ES Addendum and 2020 ES Addendum. This chapter presents an update of the impact assessment in relation to water resources. This chapter also considers whether water resources will likely be affected by the proposed Wastewater Treatment Works (WwTW) and Sustainable Drainage Systems (SuDS).

7.1.2 For clarity, the conclusion of this chapter therefore provides information in addition to the conclusions of the previous 2017 and 2020 ES Addendum. It assesses the water resources impacts of the Proposed Development only in relation to the proposed WwTW and SuDS as all other aspects of the development remain the same.

7.1.3 This chapter includes consideration of:

- The potential impact on water resources from the construction of the proposed WwTW and SuDS.

7.1.4 To provide an addendum to the previous water resources chapter, the following has been undertaken:

- Review of any updates to relevant legislation; and
- Review of proposed specification and layout of WwTW to assess the likelihood of an adverse effect on water resources, particularly in relation to water quality. Due to the Site's location within the Stour Catchment that contains the nutrient sensitive Stodmarsh habitat site, this has been done through the nutrient neutrality process.

7.2 Legislation, Policy and Guidance

7.2.1 Following the exit of the UK from the European Union (EU), the Environment (EU Exit) Regulations 2019 came into force on exit day. This includes updates to some of the legislation outlined in the 2015 ES, the 2017 and 2020 ES Addendum, to ensure that these pieces of legislation continue to function properly following exit from the EU. There are outstanding changes yet to be made to the 1991 Water Resources Act following the exit of the UK from the EU. The following legislative framework, planning policy and guidance were considered within the 2015 ES, the 2017 and 2020 ES Addendum and are still relevant:

- Legislative Framework:

- Water Framework Directive 2000/60/EC, which was transposed into legislation in England by The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017;
- Environmental Permitting Regulations 2016; and
- Water Act 2003.

- Planning Policy:
  - National Planning Policy Planning Policy Statements; and
  - Local Planning Policy.
- Guidance:
  - Control of Water Pollution from Construction Sites – Guide to Good Practice (CIRIA 2002);
  - It is noted that all Pollution Prevention Guidance (PPGs) have been withdrawn by the EA, as the legislative requirements contained within the documents are, in many cases, no longer correct. However, the PPGs and Guidance on Pollution Prevention (GPP) are still considered to be a relevant and effective source of best practice information and are widely used and accepted within the construction industry;
  - Control of Pollution from Construction Sites C532 (CIRIA 2001); and
  - Environmental Good Practice on Site C650 (CIRIA 2005).

7.3 Assessment Methodology and Significance Criteria

7.3.1 The assessment methodology utilised within the 2015 ES, the 2017 and the 2020 ES Addendum is still valid.

7.4 Baseline Conditions

7.4.1 The baseline conditions for the Site and the surrounding area were outlined within the 2015 ES, the 2017 and 2020 ES Addendum.

7.5 Potential receptors

Surface water

7.5.1 The Site is located within the Stour (Kent) catchment. A pathway exists between the Site and surface water run-off towards the Whitewater Dyke via precipitation, before continuing to the East Stour. Therefore, the following receptors were previously

identified to be potentially at risk from the Proposed Development and assessed in the previous ES addendums:

- The Whitewater Dyke; and
- The East Stour.

Foul water

7.5.2 Although located downstream of Canterbury within the Stour catchment and therefore distant from the Site, the Stodmarsh Special Area for Conservation (SAC), Special Protection Area (SPA), SSSI, Ramsar and National Nature Reserve (NNR) (for brevity this will be referred to as Stodmarsh SAC) is an internationally important site for its wildlife. Stodmarsh SAC is protected under The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 and the Conservation of Habitats and Species Regulations[1] as well as being afforded national protection for many parts of the floodplain catchment under the Wildlife and Countryside Act (2006)[2]. There are high levels of nitrogen and phosphorus input to the River Stour with sound evidence that these nutrients are causing eutrophication in parts of this designated site. These nutrient inputs are currently thought to be caused mostly by wastewater from existing housing and agricultural sources, although recycling of nutrients within the lake habitats cannot be ruled out. The resulting nutrient enrichment is causing an impact to the protected habitats and species of the Stodmarsh SAC[3].

7.5.3 Natural England states that there is uncertainty as to whether new urban growth will further deteriorate designated habitat sites, therefore the potential for future housing developments to exacerbate these impacts represents a risk to their potential future conservation status. One way to address this uncertainty and subsequent risk, until any solutions are implemented to remove the current adverse effects on Stodmarsh SAC, is for any new housing development in the Stour catchment to achieve 'nutrient neutrality' prior its wastewater reaching the water company WwTW.

[1] Conservation of Habitats and Species Regulations (England and Wales) Regulations 2017 (as amended) The Conservation of Habitats and Species Regulations 2017 (legislation.gov.uk)

[2] Including Wildlife and Countryside Act 1981 as amended, Countryside and Rights of Way Act 2000, Natural Environment and Rural Communities Act 2006.

[3] Natural England, 2020. Advice on Nutrient Neutrality for New Development in the Stour Catchment in Relation to Stodmarsh Designated Sites - For Local Planning Authorities, November 2020 – Final version V3, https://www.ashford.gov.uk/media/l3dgnfyu/stodmarsh-nutrient-neutral-methodology-november-2020.pdf.

7.6 Nutrient Neutrality Assessment

7.6.1 Natural England[4] has issued advice on considering the nutrient impacts of any new developments on internationally protected Habitats Sites, including Special Protection Areas (SPAs) and Special Areas of Conservation (SACs), and whether mitigation is needed to protect sites from additional nutrient pollution. The government is committed to reduce nutrient pollution as one of the ways to achieve the 25 Year Environment Plan that commits to restoring 75% of terrestrial and freshwater protected sites to favourable condition by 2042[5].

7.6.2 The 2022 Natural England advice meant that affected authorities have to change how they assess projects and planning applications, to consider if there is likely to be any significant effects on the Habitat Sites as designated under the Conservation of Habitats and Species Regulations 2017[6] as a result of additional nutrient loading from new developments.

7.6.3 Achievement of nutrient neutrality for new housing developments is therefore considered a way of preventing new developments from contributing to unfavourable conditions that can adversely impact natural processes, reduce biodiversity and affect wildlife at internationally protected habitat sites.

7.6.4 For new developments in areas of protected habitat sites, the nutrient neutrality approach must be applied to assess and quantify mitigation requirements. The approach uses a catchment specific Nutrient Budget Calculator to predict the nutrient budget[3] according to the four-stage methodology illustrated in **Figure 7.1**. For this assessment, nutrients are defined as Total Nitrogen (TN) and Total Phosphorus (TP). The tool is designed to calculate the predicted nutrient budget for each nutrient resulting from a proposed development discharging treated sewage effluent to the surface water catchment via a water company WwTW. The assessment also calculates the estimated net change in nutrient load likely to result from the change in land use that would occur as part of the Proposed Development.

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[4] Averley, J., 2022. Message from Chief Planner. (Online). https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1061531/Chief_Planner_Letter_about_nutrient_pollution___March_2022.pdf Accessed 15/08/2022.

[5] DEFRA, 2022. Policy paper. Nutrient pollution: reducing the impact on protected sites. (Online). Nutrient pollution: reducing the impact on protected sites - GOV.UK (www.gov.uk) Accessed 15/08/2022.

[6] Natural England, 2022b. Nutrient Neutrality: A summary guide and frequently asked questions. NE776. (Online). http://publications.naturalengland.org.uk/publication/6248597523005440?category=8005 Accessed 15/08/2022.

7.6.5 If the assessment finds that the proposed housing development results in surplus nutrients compared to the nutrient loading from the land prior to development, mitigation will be required through liaison with the Local Planning Authority.

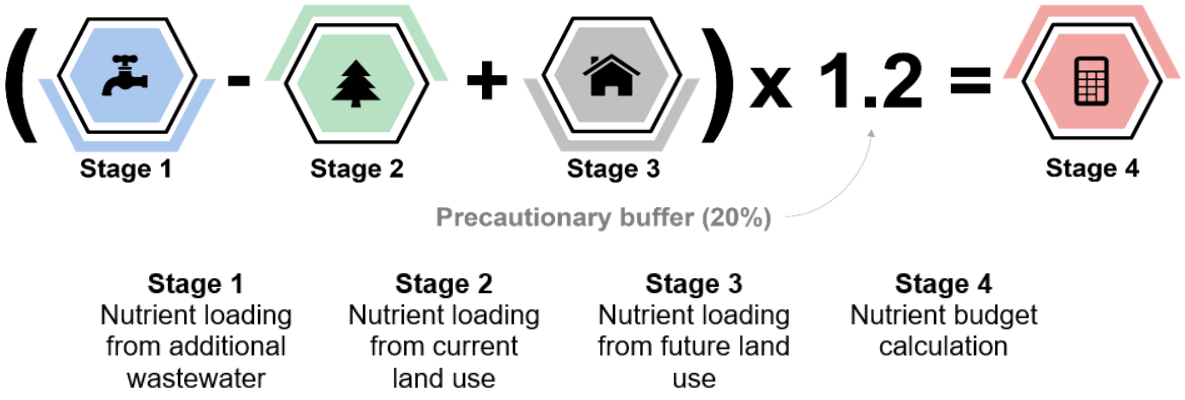

Figure 7.1: Nutrient Neutrality – four stages and equation used to calculate the nutrient budget[7].

7.7 ASSESSMENT OF EFFECTS

7.7.1 The Assessment of Effects for the Site and the surrounding area that were outlined within the 2015 ES, the 2017 and 2020 ES Addendum still apply. The Assessment of Effects in this addendum assesses the change to the design of the foul water arrangements for the Site in order to achieve nutrient neutrality for the Site and prevent any adverse eutrophication effect upon the Stodmarsh SAC and SPA from the water company WwTW discharges to the Stour. The receptor sensitivity for Stodmarsh SAC and SPA is summarised in Table 7.1.

Table 7.1: Summary of Receptors and Sensitivity

Receptor	Distance from Site	Summary of Receptor Characteristics	Receptors Sensitivity	Is the Receptor at risk from the Development?
Stodmarsh SAC and SPA	27km downstream	Stodmarsh is a Special Protection Area (SPA), a Ramsar site, a Special Area of Conservation (SAC), a Site of Special Scientific Interest (SSSI) and some parts are a National Nature Reserve (NNR).	High	Yes – the Site is within the Stour catchment.

[7] Natural England, 2022a. Natural England nutrient calculator and guidance. Natural England nutrient calculator and guidance - Partnership for South Hampshire (push.gov.uk) Accessed 09/08/2022.

7.7.2 The sections that follow specifically describe the assessment of potential effect upon the Stodmarsh SAC and SPA from foul water from the Proposed Development. This assessment makes reference to the nutrient neutrality assessment undertaken for the Proposed Development by Water Environment[8] (Appendix 7.1).

Potential Impacts of the Proposed Development on Water Resources

Construction Phase Impacts

7.7.3 There is no anticipated change to the assessment for construction phase impacts from the 2015 ES, the 2017 and 2020 ES Addendum.

Operational Phase Impacts

7.7.4 The pre-mitigation nutrient calculations show that a significant proportion of the nutrients generated from the Proposed Development would be associated with the foul waste resulting from the additional population (1,320 population equivalent) occupying the 550 new properties proposed at the Site (Site is allocated for up to 550 houses, but the current proposal is for 525 houses as stated in Appendix 7.2 and Appendix 7.2 Stage 1 Explanation. The Proposed Development would contribute 1562.10kgN/yr and 26.04kgP/yr because of its foul water discharge prior to any nutrient neutrality mitigation (Appendix 7.2 Stage 1).

7.7.5 Of the existing land use of agricultural land, 42.26 ha is used for growing cereal crops, and 7.98 ha is used for livestock grazing. The existing Surface Water Nutrient Load is predicted to be 1,005.59 kgN/year and 44.71 kgP/year (Appendix 7.2 Stage 2).

7.7.6 Adjusting for proposed new land uses at the Site including 24.69 ha of residential urban land, 2.26ha of open urban land, 23.03 ha of land used as green space, and 0.26 ha of land used for allotments, or community food growing, this results in predicted Future Surface Water Nutrient Loads for the Site of 425.18 kgN/year and 38.15 kgP/year (Appendix 7.2 Stage 3).

7.7.7 The net change in nutrient budget because of these changes at the Site has been calculated (including the recommended 20% buffer) to represent a Nutrient Budget of 1178.03 kgN/year and 23.37 kgP/year (Appendix 7.2 Stage 4), which requires the implementation of nutrient neutrality mitigation measures.

[8] Water Environment, 2022. Nutrient Neutrality Assessment and Mitigation Strategy, Kingsnorth Green Masterplan Ashford. On behalf of Pentland Homes and Malcom Jarvis Homes Ltd. Document Ref: 22072-NUT-RP-01 | C03 | Date: October 2022.

Design Solutions and Assumptions

7.7.8 As the nutrient neutrality assessment for the Site demonstrated that foul water nutrient mitigation is required, a bespoke onsite Wastewater Treatment Works (WwTW) STC1500 by Severn Trent Connect will be installed and managed to utilise the treatment processes described in paragraphs 7.7.10 to 7.7.12 (Appendix 1.1).

7.7.9 The discharge will be made under an Environmental Permit from the Environment Agency, in accordance with the Environmental Permitting Regulations (2016). This will include the setting and adherence to numeric concentration limits (see paragraph 7.7.13) for the discharge. Therefore, no further assessment of effect is considered necessary for the Whitewater Dyke or the East Stour.

7.7.10 A foul only sewerage system arrives at the WwTW through an inlet works, where a series of screens remove wipes, grit, and other matter not suitable for treatment. The screened water is transferred to a covered balance tank/fermenter, to balance the incoming flows and to enable the Phosphorus Accumulating Organisms present in the Reactors to super absorb Phosphorus before it passes into the Reactor. The Reactor fills and decants using piston effect on influent so that a sludge blanket remains undisturbed and the clean effluent at the top of the tank is discharged. The aerobic and anoxic treatment stages are carried out once the fill and decant is complete.

7.7.11 The sludge generated from the Reactor is thickened using sludge thickening equipment and held in an aerated sludge storage tank that is aerated to prevent the sludge causing an odour issue or becoming septic. Any supernatant is returned to the head of works.

7.7.12 The final effluent discharged from the reactors, flows through a simple chamber prior to discharging to the River East Stour. It is also possible for an attenuation tank to be included if there is a permitted discharge flow rate.

7.7.13 A proposed environmental permit with numeric limits set at 12 mgN/l and at 0.3 mgP/l will be sought from the Environment Agency to discharge to surface waters. In line with Natural England (NE) guidance for sewage to a wastewater treatment works operated by a water company with a permit limit, the effluent concentration used in the nutrient neutrality assessment is 90% of the permit limit, resulting in a Future Wastewater Nutrient Loads of 624.84 kgN/year and 15.62 kgP/year.

7.8 Mitigation

7.8.1 Further mitigation is required to reduce nutrients by 13% for TN and 25% for TP. Water Environment[8], propose incorporating the 0.42ha 'bioretention' Sustainable Drainage Systems (SuDS) for the Site (see Appendix 7.1 Appendix A Drawing No. 191231-001-Rev D). The SuDS includes swales, open basins and ponds, with constructed reedbeds in the bed to mitigate the nutrients (Appendix 7.1 and Appendix 7.3). The CIRIA[9] SuDS Manual (C753) suggests that a reduction in surface water loading of 50% is achievable for TN, and a reduction of 80% is achievable for TP, which is a higher removal efficiency than the required reductions.

7.8.2 Management and maintenance of the SuDS will be the responsibility of an appointed maintenance company. Maintenance will be carried out in accordance with the CIRIA SuDS Manual C753.

7.8.3 Neutrality will be achieved by using SuDS to reduce the Future Surface Water Nutrient loading from the proposed development of 425.18 kgN/year and 38.15 kgP/year by at least 53.32 kgN/year and 10.87 kgP/year in order to achieve nutrient neutrality.

7.9 Residual Effects

7.9.1 The Nutrient Neutrality Assessment uses a Mitigation Strategy that includes a bespoke foul water onsite Wastewater Treatment Works to deliver nutrient reduction. Following treatment, the Stage 1 Future Wastewater Nutrient Load from the Site will be 624.84 kgN/year and 15.62 kgP/year (Appendix 7.3 Stage 1).

7.9.2 Following treatment, the Stage 3nutrient reductions due to the change in land use and implementation of SuDS has reduced the Future Surface Water Nutrient Loads by 13% for TN and 25% for TP. As a result, the overall nutrient budget for the Site with the new site land use has reduced by 53.32 kgN/yr and 10.87 kgP/yr (Appendix 7.1).

7.9.3 The bespoke foul water nutrient loading following implementation of WwTW as a design solution to reduce loading from the development (Mitigation Strategy, Stage 1) is offset by adding SuDS to the Site (Appendix 1.1 and Appendix 2.1). The SuDS area is predicted by the Nutrient Neutrality Tool to offset at least the minimum required reductions of 53.32 kgN/year and 10.87 kgP/year (Appendix 7.3), which is sufficient to make the Site neutral for both Total Nitrogen and Total Phosphorus.

[9] CIRIA (2015) The SuDS Manual (C753F). (Online). https://www.ciria.org/ItemDetail?iProductCode=C753F&Category=FREEPUBS Accessed 02/09/2022.

7.9.4 No significant residual effects are predicted following the implementation of nutrient neutrality mitigation measures at the site.

7.10 Assessment of Cumulative Effects

7.10.1 It is assumed that any new residential development in the Stour catchment will need to demonstrate nutrient neutrality to the Local Planning Authority and Natural England to be granted planning permission. As such, no cumulative effects are predicted from other residential developments in the Stour catchments in terms of nutrient loading in the catchment.

7.11 Conclusions

7.11.1 The Proposed Development has been assessed for the water environment in the 2015 ES, the 2017 ES Addendum and the 2020 ES Addendum, against which the only change that is presented in this addendum is for the nutrient loading from the Stour catchment from the Proposed Development.

7.11.2 Due to the presence of an internationally important habitat in the Stour catchment, namely the Stodmarsh SAC/SPA/Ramsar/SSSI/NNR, nutrient loading from new residential developments represents a significant risk of eutrophication and deterioration in habitat condition. In accordance with Natural England advice on achieving nutrient neutrality to prevent such adverse impacts, a nutrient neutrality assessment has been undertaken for the Proposed Development. This has determined that the increase in nutrient loading of the foul drainage from 550 new dwellings at the Site requires mitigation by implementation of a bespoke foul water WwTW and SuDS to make the Site's nutrient balance neutral.

8 NOISE AND VIBRATION

8.1 Introduction

8.1.1 In relation to noise and vibration, this ES Addendum chapter has been produced to consider potential noise effects from the proposed Wastewater Treatment Works (WwTW) at existing and proposed sensitive receptors.

8.1.2 Planning policy and assessment methodology is as set out within the 2020 ES Addendum and 2017 Noise and Vibration ES Chapter.

8.2 Baseline Conditions

Desk Study

8.2.1 The potential major sources of noise contributing to baseline conditions were identified through a desktop study, as set out within the 2020 ES Addendum.

Noise Survey

8.2.2 On the 25th and 26th April 2017, Wardell Armstrong LLP (WA) carried out a noise survey to assess the noise levels across the Site. Additional noise monitoring was subsequently carried out by WA on the 2nd and 3rd November 2017 to measure background sound levels in the vicinity of the proposed WwTW.

8.2.3 The noise assessment carried out in this ES Addendum is informed by baseline noise levels measured in November 2017. Through consultations carried out with Ashford Borough Council, via email, it has been agreed that data measured as part of the November 2017 noise survey is suitable to be used to inform the noise assessment of the WwTW.

8.2.4 Therefore, the baseline conditions and noise measurements are as set out within the 2020 ES Addendum.

Sensitive Receptors

8.2.5 The Existing Sensitive Receptors (ESRs) which are expected to be most affected by operations at the WwTW have been identified and are shown in Figure 1 at Appendix 8.1. The ESRs identified are existing residential premises, located closest to the proposed WwTW.

8.2.6 Proposed residential receptors, included as part of the Proposed Development are assumed to include the appropriate level of sound insulation to mitigate any impact of the WwTW. Therefore, proposed sensitive receptors have not been considered as part of this ES Addendum.

Assessment of Background Sound Levels

8.2.7 The night-time background sound levels have been measured and are set out as part of the 2020 ES Addendum. The night-time period is typically when people are most sensitive to noise, therefore the impact of the proposed WwTW has been carried out during the night-time to present a robust assessment.

8.2.8 The Addendum identified that the representative background sound level, during the night-time periods, is 27dB(A).

8.3 Assessment of Effects

8.3.1 The proposed WwTW has the potential to cause a noise impact at the existing sensitive receptors, therefore, an industrial noise impact assessment has been carried out in accordance with BS4142.

8.3.2 Details of the proposed WwTW have been provided by the client. The information provided includes the layout of the proposed facility, and equipment used in the operations of the WwTW. The facility is understood to operate uniformly throughout a 24-hour period. Therefore, the noise assessment has been carried out over the night-time period, to represent the noise impacts over the most sensitive period.

8.3.3 Computer noise modelling, in SoundPLAN v8.2 modelling software has been used to calculate the sound levels generated by the proposed WwTW, and the propagation of sound to nearby sensitive receptors.

8.3.4 SoundPLAN software uses geographical information to create a model of the study area on which to generate noise contours and includes objects that affect the propagation of noise such as buildings and topography.

8.3.5 The SoundPLAN model uses the noise prediction methodology set out in ISO 9613-2:1996 'Attenuation of sound during propagation outdoors'. The noise modelling produces noise contour plans demonstrating the levels of road traffic and industrial noise across the site.

8.3.6 The model assumes a temperature of 10^{o}C, 70% humidity, and 1013.3mbar air pressure. The intervening ground between the facility and the workshop is a mixture of hard and soft ground, hence the use of 0.6 as the term to represent ground absorption (where 0 = completely absorbent and 1 = completely reflective).

Noise Model Set Up

8.3.7 The noise sources proposed as part of the WwTW have been included in the noise model, these are detailed in Table 8.1 below, and shown on Figure 2 (Appendix 8.1).

Table 8.1: Noise Sources Input in Computer Noise Model					
Noise Source	**Type of Source**	**Quantity**	**Sound Power Level (dB(A))**	**On-Time**	**Source Reference**
Manure Pump	Point	1	82	100% of a 24-hour period	SoundPLAN Data Library
SEW Geared Motor	Point	1	75	100% of a 24-hour period	Client Data
Hyperclassic HMCA	Point	2	67	100% of a 24-hour period	Client Data
Air Blower	Point	2	93	100% of a 24-hour period	Client Data
Pump Z17B	Point	4	74	100% of a 24-hour period	Client Data
Gas Compressor	Point	1	100	100% of a 24-hour period	SoundPLAN Data Library

8.3.8 In addition to the above, it is understood that the proposals include a generator, to allow the site to operate in the event of a power cut. As this would be considered to be an emergency situation, the generator is not considered as part of the typical operations of the Site. Therefore, this has not been included in the proposed operations of the Site.

Assumptions

8.3.9 The following assumptions have been made as part of the noise assessment:

- All plant and equipment associated with the development will be operational for 24 hours a day.
- The gas compressor will be located within an enclosure constructed out of 140mm blockwork or better. The roof of the enclosure will be constructed using Kingspan KS1000 or better.
- The generator will only be operational during blackouts and emergency situations.
- Noise from vehicle movements will not be such that it will affect nearby residents.
- Proposed dwellings will be sufficiently protected from noise from the WwTW through mitigation measures included in the dwellings' design.

Uncertainty

8.3.10 To reduce the level of uncertainty within the assessment, the following steps have been taken:

- All data regarding noise generated by plant and equipment was taken from credible sources of information.
- Activities undertaken at the WwTW have been informed by the client.

Identification of Specific Noise

8.3.11 Details of the noise generating plant and equipment have been input into the computer noise model, and are set out in Table 8.1. The specific noise, at existing receptors, generated by the WwTW will be dominated by plant noise from the facility. The industrial noise has been modelled over a 15-minute period during the night-time, in accordance with advice in BS4142.

8.3.12 Computer noise modelling shows that industrial noise will generate a specific noise level of 37dB(A) at ESR1 during the night-time, and 36dB at ESR2 during the night-time.

Rating Level

8.3.13 The proposed plant and equipment associated with the WwTW, is considered to generate broadband, steady-state noise levels, therefore no corrections for acoustic characteristics need to be applied to the specific noise levels.

Comparison of Background Sound and Rating Level

8.3.14 In accordance with BS4142, the calculated night-time rating levels from the WwTW, affecting the nearby ESRs, have been compared against the measured background sound level, as shown in Table 8.2 below.

Table 8.2: BS4142 Assessment of Night-time Industrial Noise from the WwTW (Figures in dB(A))

Description	ESR1	ESR2
Specific Sound Level (dB)	37	36
Acoustic Correction Feature (dB)	0	0
Rating Level (dB)	37	36
Background Noise Level (dB L_{A90})	27	27
Excess of rating over background level (dB)	+10	+9

8.3.15 The results of the BS4142 assessment, in Table 8.2, indicate that with no mitigation measures in place, noise levels from the WwTW will exceed the background sound levels during the night-time periods at the ESRs, by up to 10dB. In accordance with BS4142, this is an indication of a significant adverse impact due to noise, depending

on context. The noise levels generated by the proposed WwTW are shown on Figure 3 at Appendix 8.1.

8.3.16 As shown, the level of industrial noise at dwellings located further away from the WwTW is lower than the figure shown above.

BS4142 Context Assessment

8.3.17 BS4142 states that the acceptability of the noise level depends on the context. BS4142:2014 states *"The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound sources exceeds the background sound level and the context in which the sound occurs".*

8.3.18 The first requirement of this statement has been determined within the noise impact assessment section above. To determine the context in which the industrial sound will reside, three factors must be considered, these are;

- The absolute level of sound;
- The character and level of the residual sound compared to the character and level of the specific sound; and;
- The sensitivity of the receptor.

Absolute Level of Sound

8.3.19 To determine the first context test in BS4142 it is necessary to determine whether the residual and background sound levels are high or low. Section 11 of BS4142 states;

> *"Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night.*
>
> *Where residual sound levels are very high, the residual sound might itself result in adverse impacts or significant adverse impacts, and the margin by which the rating level exceeds the background might simply be an indication of the extent to which the specific sound source is likely to make those impacts worse."*

8.3.20 The background sound and rating levels during the night-time periods are considered to be low. Therefore, the absolute level of noise from the WwTW is thought to be more relevant than the margin by which the rating level exceeds the background sound. It is therefore thought to decrease any potential noise impact.

Character and Level of Residual Sound Compared with the Rating Level

8.3.21 The character of the observed residual noise during the night-time is dominated by road traffic noise, which contains low to mid frequency noise. The specific noise at the WwTW mainly contains broadband, low to mid frequency noise. Therefore, some components of noise from the WwTW are likely to be masked by residual noise at the existing sensitive receptors. Therefore, this is expected to reduce any impact of noise at the ESRs.

8.3.22 The absolute level of sound from the industrial premises is low during the night-time period and is significantly lower than the residual sound, of 52dB(A) at ML1 during the night-time.

8.3.23 It is therefore likely that noise form the WwTW will not be fully masked by residual noise, and not audible at ESRs.

Sensitivity of Receptor

8.3.24 With regard to pertinent factors to be taken into consideration, Section 11 of BS4142 states;

> *"The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions, such as:*
>
> *i) facade insulation treatment;*
>
> *ii) ventilation and/or cooling that will reduce the need to have windows open so as to provide rapid or purge ventilation; and*
>
> *iii) acoustic screening."*

8.3.25 The glazing and ventilation strategy installed at the existing sensitive receptors is not known, however, to ensure a robust assessment, it has been assumed they will rely on open windows to maintain suitable levels of background ventilation.

8.3.26 It is generally agreed that open windows provide 13dB(A) of attenuation. Therefore, even with windows open, the internal noise level from the WwTW will achieve the BS8233 guideline criteria, during the night-time.

8.3.27 The rating level of noise generated by the WwTW is lower than the guidance noise level in external garden areas, as detailed within BS8233, at the nearest proposed dwellings to the industrial premises. As such, the WwTW is not expected to adversely impact the amenity of the ESRs, therefore, any impact of industrial sound, is likely to be lower than that shown in Table 8.2.

Summary of BS4142 Assessment

8.3.28 An assessment of industrial noise was carried out on site to establish the likelihood of the proposed WwTW affecting the nearby existing sensitive receptors at night.

8.3.29 The assessment has found that the premises located closest to the WwTW are expected to experience a **significant adverse impact**, during the night-time, with no mitigation measures in place.

8.3.30 The context assessment has found that, in context, the impact of noise is reduced to below that shown in Table 2. However, it is considered that mitigation measures are required to reduce the noise from the WwTW to more acceptable levels.

8.4 Mitigation

8.4.1 It has been identified that with no specific mitigation measures in place, the WwTW will generate a significant adverse impact at the nearby ESRs. Therefore, mitigation measures are required to reduce the noise generated by the site.

8.4.2 In order to reduce noise from the site at receptors, noise from the air blowers, associated with the WwTW should be mitigated. This should be done by construction of an enclosure around the air blowers.

8.4.3 The enclosure should be constructed with 140mm concrete blocks, with a roof made from Kingspan KS1000.

8.4.4 With the recommended enclosure in place, the noise levels will be reduced to 28dB at ESR1 and 29dB at ESR2, against a background noise level of 27dB. This is therefore an indication that the WwTW is not likely to generate an adverse impact at ESRs. When considered in line with the context assessment set out above, the WwTW is considered to generate a **low impact** , which is the lowest impact category available in BS4142, and is not likely to be audible internally at ESRs. The specific sound level generated by the WwTW, with the proposed mitigation measures in place are shown in Figure 4 at Appendix 8.1.

8.4.5 No further mitigation measures are therefore considered to be required.

8.5 Residual Effects

8.5.1 Mitigation measures will be incorporated into the site design at the detailed design stage in order to ensure the noise impacts of the proposed WwTW are reduced to acceptable levels at the proposed sensitive receptors.

8.5.2 The sensitivity of the existing sensitive receptors is moderate and the magnitude of

change, following mitigation, is small. Following the implementation of mitigation measures, there is likely to be a direct, permanent, long-term residual effect on receptors from the WwTW of **negligible (Not Significant)**.

8.6 Summary

8.6.1 With mitigation measures in place, it is considered that the impact of the proposed WwTW on the existing sensitive receptors will be **negligible**.

9 AIR QUALITY

9.1 INTRODUCTION

9.1.1 This Chapter of the ES is an addendum to the previous Air Quality chapters written by Wardell Armstrong in 2015, 2017 and 2020.

9.1.2 This addendum addresses the requirement to undertake an odour assessment for the proposed Wastewater Treatment Works (WwTW) within the Proposed Development. This comprises the following:

- Detailed odour dispersion modelling, using AERMOD software, to assess the potential odour impact of the proposed WwTW.

9.1.3 It is not considered that an update to the 2020 Air Quality assessment, which considered the air quality impacts of development-generated traffic on existing and proposed receptors, is required as part of this addendum as there is no change to the quantum of development or traffic data.

9.2 LEGISLATION, POLICY AND GUIDANCE

Odour Legislation and Planning Policy

9.2.1 The Environmental Protection Act 1990[1] is the legal framework dealing with odour from industrial, trade or business premises. If odour is present in sufficient quantity, this may constitute a statutory nuisance. The Local Authority is placed under a duty to inspect, detect any nuisance and to serve abatement notices where necessary.

9.2.2 The National Planning Policy Framework (NPPF)[2], introduced in March 2012 and most recently revised in July 2021, sets out planning policy for England. Paragraph 185 advises that planning policies and decisions should ensure that "*development is appropriate for its location taking into account the likely effects… of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development".*

9.2.3 In addition, Section 15 of the NPPF advises that "*Planning policies and decisions should contribute to and enhance the natural and local environment by… preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or*

[1] Environmental Protection Act, 1990
[2] Department for Communities and Local Government, National Planning Policy Framework, July 2021

land instability".

Environment Agency H4 Odour Management Guidance

9.2.4 The Environment Agency (EA) has produced a horizontal guidance note on odour management[3], designed for operators of EA regulated odorous processes.

9.2.5 The guidance note recognises that not all odours have the same potential to cause annoyance and odours from, for example, sewage treatment tends to be more 'offensive' than, those from the brewing or baking industries. This has led to a suggested indicative odour exposure criterion of $3ou_E/m^3$ for odours associated with wastewater treatment, compared to $6ou_E/m^3$ for brewery and bakery processes (98^{th} percentile of 1-hour mean concentration).

9.2.6 Odour can be detected at concentrations as low as $C_{98,\ 1\text{-hour}}$ $1ou_E/m^3$. As a very approximate guide:

- At $C_{98,\ 1\text{-hour}}$ 1 - 5ouE/m3, the odour is recognisable;
- $C_{98,\ 1\text{-hour}}$ 5ouE/m3 is classed as a faint odour; and
- $C_{98,\ 1\text{-hour}}$ 10ouE/m3 is classed as a distinct odour.

9.2.7 The values for normal background odours such as from traffic, grass cutting, and plants amount to anything from 5 to $40ou_E/m^3$.

9.2.8 Odour is subjective and therefore what one person may find offensive the next person may not. A rapidly fluctuating odour is often more noticeable than a steady background odour at a low concentration. People can detect and respond to odour exposure that lasts as little as one or two seconds. Factors that are examined when considering the existence of a statutory nuisance are:

- Type of odour;
- Wind strength and direction;
- Duration of odour;
- Time of day; and
- How often it occurs.

9.2.9 When modelling odour impacts, the EA guidance recommends the use of the 98^{th} percentile values of hourly mean concentrations. ($C_{98,\ 1\text{-hour}}$). These are based on odour concentrations which occur for more than 2% of the total hours in a year and are

[3]Environment Agency, Technical Guidance Note H4 – Odour Management, 2011

compared against the benchmark odour criteria thresholds provided within the guidance.

9.2.10 The benchmark odour criteria detail indicative odour thresholds to apply to a given odour source which can then be used as a guide to determine the appropriate criteria ($C_{98,\ 1\text{-hour}}$) to apply within the assessment.

- 1. 5 OU_E for most offensive odours;
- 3.0 OU_E for moderately offensive odours; and
- 6.0 OU_E for less offensive odours.

9.2.11 Modelling results which predict odour concentrations above the benchmark threshold identified for use within the assessment have the potential to cause odour nuisance.

Institute of Air Quality Management (IAQM) Guidance

9.2.12 The Institute of Air Quality Management have published Guidance for the assessment of odour entitled 'Guidance on the assessment of odour for planning' (July 2018)[4]. This guidance states what information, monitoring and reporting is required for an odour assessment, in support of planning applications. The IAQM Guidance is the only UK odour guidance containing methods for estimating the significance of potential odour effect.

9.2.13 The IAQM guidance endorses the use of multiple assessment tools for odour, stating that, "*best practice is to use a multi-tool approach where practicable".*

9.2.14 The IAQM guidance recognises that all year-round site visits are often unfeasible due to planning application timetables, deadlines and costs. However, the guidance still recommends that three site visits should be undertaken as a minimum, and that these visits should be representative of at least 70% of the Pasquill stability categories experienced at the site over the course of a year.

9.2.15 The Pasquill stability categories are a method for calculating turbulence based on wind speed, solar radiation and cloud cover.

9.2.16 The guidance also includes the use of the FIDOL (Frequency, Intensity, Duration, Offensiveness and Location) factors to determine the degree of odour pollution. Sniff tests are defined by a hedonic score, a quantitative value that is assigned to the odour. The hedonic score varies from +4 (e.g., bakery smell) through neutral to highly unpleasant -4 (e.g., rotting flesh).

[4] Institute of Air Quality Management (July 2018), Guidance on the Assessment of Odour for Planning

9.3 ASSESSMENT METHODOLOGY

Consultation and Scope of the Assessment

9.3.1 Consultation relating to the detailed modelling elements of the odour assessment has been undertaken with Severn Trent Connect (STC), the operator of proposed WwTW, in a series of communications between 25th July and 5th September 2022. A summary of this consultation is provided below:

- A detailed odour dispersion modelling assessment of the proposed WwTW would be undertaken. Detailed model input data including odour emission rate data for all proposed odorous sources at the WwTW, as well as information relating to their size, location and frequency of operation was requested from STC via email on 25th July 2022;
- STC responded via email on 26th July with some preliminary odour emission rate data for use within the assessment;
- Further consultation was undertaken with STC via email on 31st August to obtain further data and clarify the model inputs and emission rate data for use within the assessment.
- STC replied via email on 5th September 2022 to confirm the inputs, which are provided in detail in Table 9.1 later in this Chapter.

9.3.2 The odour assessment methodology was also sent to Ashford Borough Council (ABC) via email on 5th September 2022 to discuss the scope of work to be undertaken:

- The odour dispersion modelling will be undertaken using AERMOD (Lakes Environmental, Version 10.2.1) and will be carried out in accordance with Environment Agency (EA) modelling guidance and the EA Technical Guidance Note 'H4 – Odour Management' (March 2011),
- Five years of sequential hourly wind data will be used within the assessment. It is considered more representative to use Numerical Weather Prediction (NWP) meteorological data within the odour assessment, which is based upon co-ordinates of the proposed WwTW within the development site (as opposed to obtaining meteorological data from the nearest representative recording station approximately 73km away);
- We will obtain the necessary input data for use within the model, including odour sources and emission rates, from ST, the operator of the proposed WwTW.

9.3.3 At the time of writing, no response has been received from ABC to the proposed

methodology.

Overview of Treatment Methods at Proposed WwTW

9.3.4 The main purpose of a WwTW is to remove odorous solids from the wastewater and effectively treat and clean the residual wastewater so that it can be returned to the environment.

9.3.5 The proposed WwTW has been designed by STC and they will be responsible for the operation and management of the WwTW during its operation. STC has confirmed the treatment processes to be used at the proposed WwTW, which are described in more detail below.

Inlet flows

9.3.6 Wastewater arriving at the WwTW passes through the inlet works, where a series of screens remove wipes, grit, and other matter not suitable for onward treatment.

Balance tank / fermenter

9.3.7 The screened wastewater is transferred to the covered balance tank / fermenter (BTF). The BTF serves two distinct purposes in the treatment cycle. Firstly, it is used to balance the incoming flows prior to being passed forward for processing in the Reactors. Its second function is to act as an anaerobic fermenter; crucial to enable the phosphorus accumulating organisms present in the reactors to super absorb phosphorus.

Reactors

9.3.8 The reactors use simultaneous fill and decant, whereby the treated water is discharged using a piston effect created by the introduction of the fermented, raw, screened sewage. This influent is introduced at the bottom of the tank where it is gently mixed with the settled biomass using a hyperboloid mixer. The sludge blanket remains undisturbed, whilst the clean effluent in the top of the tank is discharged.

9.3.9 Once the fill/decant stage is complete, and the influent has had appropriate contact time with the biomass, the aerobic and anoxic treatment stages are carried out. The duration and timing of these phases are varied dependent on specific site conditions and permit requirements.

Sludge thickening

9.3.10 The sludge generated by the process can be thickened using sludge thickening equipment. Thickened sludge is held in the aerated sludge storage tank, whilst supernatant is returned to the head of works.

Aerated sludge storage

9.3.11 Thickened sludge is stored within this tank and periodically aerated using a coarse bubble aeration grid to prevent the sludge thickening too much at the bottom of the tank and to prevent the sludge becoming septic and causing odour issues.

Final effluent discharge

9.3.12 The final effluent discharged from the reactors, flows through a sample chamber prior to discharging to the environment. Should there be a restriction on the permitted discharge flow rate, then an attenuation tank can be included.

Assessment Methodology

9.3.13 Emissions to atmosphere from the proposed WwTW have been modelled using AERMOD (Lakes Environmental). This is a proprietary quantitative dispersion model that is based upon the Gaussian theory of plume dispersion. The model uses all input data, including the characteristics of the release (i.e., rate, temperature, velocity, height, location, etc.), meteorological data and the locations of the buildings adjacent to the proposed emission points (where appropriate), to predict the concentration of odour at specified points and at points across a uniform Cartesian grid.

9.3.14 The model uses sequential hourly meteorological data and the locations of the buildings, to predict the concentration of each substance at each point for each hour over the course of a year. This allows long-term mean and short-term peak ground level concentrations to be estimated over the modelled area, as required.

9.3.15 The odour dispersion modelling has been carried out in accordance with guidance included within the EA H4 Odour Management document.

Model Inputs

Emission Parameters for Odour Sources

9.3.16 Details of the sources to be included in the model are included in Table 9.1. The locations of these sources are shown in Appendix 9.1.

Table 9.1: Sources and Odour Emission Rates – Area Sources

Odour Source Model Reference	Odour Source Description	SW Corner / Centre Grid Reference		Emission Rate (OU/m²/s)	Area (m²)	Height (m)	Base Elevation (m)
		X	Y				
Polygon Sources							
INLET	Inlet Works*	599901	139412	50	16.5	4.5	40

Table 9.1: Sources and Odour Emission Rates – Area Sources							
Odour Source Model Reference	**Odour Source Description**	**SW Corner / Centre Grid Reference**		**Emission Rate (OU/m²/s)**	**Area (m²)**	**Height (m)**	**Base Elevation (m)**
		X	**Y**				
OUTLET	Outlet Channel*	599936	139431	0.7	12	0	40
Circular Sources							
REACT_02	Reactor 2*	599911	139424	10	46.3	6.334	40
REACT_01	Reactor 1*	599914	139432	10	46.3	6.334	40
ATTEN_TANK	Attenuation Tank*	599918	139440	0.7	14.3	4.935	40
SLUDG_THICK	Aerated sludge thickening tank†	599928	139435	40	14.5	4.273	40
SLUDG_HOLD	Aerated sludge holding tank†	599933	139433	40	9.8	3.535	40
BAL_TANK	Balance Tank^	599907	139415	0.1	46.3	4.273	40
†UKWIR 'Very High' emission rate *UKWIR 'Typical' emission rate ^ UKWIR 'Low' emission rate							

9.3.17 All emission rates have been taken from library values within the UKWIR document[5]. and have been agreed as suitable for use within the assessment with STC.

Existing and Proposed Sensitive Receptor Locations

9.3.18 The assessment includes consideration for odour from the proposed WwTW to impact both the existing sensitive receptors located outside of the Proposed Development site, and the proposed sensitive receptors to be built within the Proposed Development site.

9.3.19 Table 9.2 below shows the existing sensitive receptors included in the assessment as discrete Cartesian receptors.

Table 9.2: Discrete Cartesian Receptors – Existing Residential Receptors			
Name	**X**	**Y**	**Z**
ESR 1	599991	139554	1.5
ESR 2	600053	139419	1.5
ESR 3	600062	139412	1.5
ESR 4	600088	139391	1.5
ESR 5	600104	139346	1.5
ESR 6	600045	139492	1.5
ESR 7	600071	139463	1.5

[5] UK Water Industry Research Limited "Odour Control in Wastewater Treatment – A Technical Reference Document" (2014)

9.3.20 The exact locations of proposed residential receptors within the Site are not yet known. Therefore, a uniform Cartesian grid has been modelled which covers the area of the Site (including the proposed WwTW), as well as the existing sensitive receptors surrounding the Proposed Development. This allows odour contour plots to be produced, which show the extent of odour impact from the proposed WwTW across the Site and beyond.

9.3.21 The parameters of the modelled Cartesian grid are included in Table 9.3.

Table 9.3: Uniform Cartesian Grid Parameters

Parameter	X	Y
South-west Grid Coordinates	599762.23	139182.26
Number of Points	40	40
Spacing (m)	10	10
Length (m)	390.00	390.00
Total Number of Grid Receptors	1600	

9.3.22 The uniform grid has been modelled at a height of 1.5m as this is representative of the average ground level breathing height (i.e., the proposed and existing residential receptors).

Meteorological Data

9.3.23 Meteorological data has the greatest impact of the determination of the dispersion of odour from a given source. In modelling terms, the meteorological data input into the model will determine the dispersion characteristics of odour from the proposed WwTW and therefore it will affect the distribution of contours of predicted odour levels across the development site and at existing receptors outside of the site.

9.3.24 The nearest representative meteorological recording station is located approximately 73km from the Proposed Development site. Therefore, Numerical Weather Prediction (NWP) Meteorological data has been obtained from ADM Ltd for use in the model, and this is considered to be the most representative of on-site conditions.

9.3.25 Whilst still not fully representative of actual meteorological conditions experienced on site, the use of this data in the assessment is considered to be more robust than using data from the nearby meteorological station.

9.3.26 Five years of hourly sequential data (i.e., 2017 to 2021) have been obtained from ADM Ltd, with each year of data being considered separately within the model.

Surface Characteristics

9.3.27 The predominant characteristics of land use in an area provide a measure of the vertical mixing and dilution that is likely to take place in the atmosphere due to factors such as surface roughness and albedo.

9.3.28 The met data used within the assessment has been processed using AERMET software which allows for the incorporation of the surface characteristics around the Proposed Development site.

9.3.29 Examination of the local setting shows that the site is semi-rural, with urban land uses to the north and north-east, and more open, cultivated land to the south and west. The met data has been processed using AERMET software to account for these land uses.

Terrain

9.3.30 To consider the impact of terrain surrounding the site on the dispersion of pollutants, x.y.z format terrain data has been used in the model.

Treatment of Buildings

9.3.31 Building downwash occurs when the aerodynamic turbulence induced by nearby buildings cause a pollutant, emitted from an elevated point source, to be mixed rapidly toward the ground (downwash), resulting in higher ground-level concentrations.

9.3.32 If buildings are present within a distance of 5 times the height of the point source stack, they can be modelled in AERMOD to assess the impact of building downwash on the odour/pollutant concentrations.

9.3.33 As all the odour sources are area sources, and there are no elevated point source emissions at the proposed WwTW, the effects of building downwash cannot be included within the AERMOD model. Therefore, buildings have not been included within the assessment.

Modelling Uncertainties

9.3.34 The odour assessment has adopted a conservative approach to try to address the uncertainties involved with dispersion modelling.

9.3.35 The assessment has assumed that all odour sources and associated emission rates will be constant throughout the year.

9.3.36 Emission rates have been obtained from UKWIR library values and have been agreed with STC as being representative of the emission sources at the proposed WwTW.

9.3.37 The emission rates associated with the aerated sludge holding and thickening tanks are considered to be overly conservative as, in reality, emissions are likely to be lower, due to the presence of aeration which, through the addition of oxygen to the sludge, encourages greater treatment efficiency and reduces potential odour issues associated with septicity (when compared to sludge tanks without aeration).

9.3.38 In order to address uncertainties within the meteorological data, the model has included five years' worth of NWP meteorological data, in accordance with the EA H4 odour guidance. Each individual year of met data has been run separately, and the highest results presented.

9.3.39 Each year of meteorological data has been processed using AERMET software to allow the model to account for the land uses and surface roughness values around the proposed WwTW.

9.3.40 Terrain data has been included in order to address uncertainties relating to the dispersion of odour in the vicinity of the proposed WwTW.

9.3.41 All receptors included in the model have been modelled at a height of 1.5m as this is representative of the average ground level breathing height. Sensitivity testing has been undertaken to compare modelled odour concentrations at ground level (0m). As all but one odour source at the proposed WwTW are elevated, adopting a receptor height of 1.5m results in a more robust approach.

9.3.42 As a result of these conservative inputs, it is considered the model is more likely to provide an overestimation of the potential odour effects of the WwTW than an underestimation.

9.4 SIGNIFICANCE CRITERIA

Odour Benchmark Criteria

9.4.1 IAQM guidance states that "*odours from sewage treatment works plant operating normally, i.e., non-septic conditions, would not be expected to be at the 'most offensive' end of the spectrum*" and "*can be considered on par with 'moderately offensive' odours*".

9.4.2 Therefore, in accordance with the benchmark criteria outline in EA guidance, a moderately offensive odour source should apply the $C_{98,\ 1\text{-hour}}$ $3ou_E/m^3$ odour benchmark criterion.

9.4.3 The IAQM guidance has also produced proposed odour effect descriptors for impacts predicted as part of a detailed odour modelling assessment. The impact descriptors

for a 'moderately offensive' odour source are detailed below in Table 9.4.

Table 9.4: Proposed Odour Effect Descriptors for impacts predicted by modelling – 'Moderately Offensive' Odours

Odour Exposure Level $C_{98,\ 1\text{-hour}}$ ou_E/m^3	Receptor Sensitivity		
	Low	Medium	High
≥10	Moderate	Substantial	Substantial
5 - < 10	Slight	Moderate	Moderate
3 - < 5	Negligible	Slight	Moderate
1.5 - < 3	Negligible	Negligible	Slight
0.5 - < 1.5	Negligible	Negligible	Negligible
<0.5	Negligible	Negligible	Negligible

9.4.4 In accordance with Table 7 of the IAQM guidance, for highly sensitive receptors (such as residential dwellings) odour concentrations that exceed $C_{98,\ 1\text{-hour}}$ $3ou_E/m^3$ are considered to correlate to a 'Moderate Adverse' impact which is a 'significant' impact in accordance with guidance. Odour concentrations below this level are considered to be either slight adverse or negligible, which is 'not significant' in accordance with the guidance.

9.4.5 Based on the above, the IAQM guidance agrees with the EA guidance in that the $C_{98,\ 1\text{-hour}}$ $3ou_E/m^3$ odour benchmark criterion is suitable for moderately offensive odours.

9.4.6 Therefore, given the nature of the odour source and sensitivity of the closest existing and proposed receptors, a level of $C_{98,\ 1\text{-hour}}$ $3ou_E/m^3$ has been adopted for the assessment (98th percentile of 1-hour mean concentration). This criterion has been assessed across a receptor grid which covers the proposed WwTW, the Proposed Development Site as a whole, and existing sensitive receptors in close proximity to the Site.

9.5 ASSESSMENT OF EFFECTS

Odour Dispersion Modelling Results

9.5.1 Odour concentrations, as a result of the operation of the proposed WwTW, have been modelled across a receptor grid which covers the proposed WwTW, the Site and surrounding area (see Table 9.1). Concentrations have been predicted for each of the five years of meteorological data (i.e., 2017 to 2021).

9.5.2 The assessment has considered the $C_{98,\ 1\text{-hour}}$ $3ou_E/m^3$ as the benchmark criterion, as

this is the criterion which is applicable for residential use affected by a 'moderately offensive" odour source, in accordance with EA and IAQM guidance. Any residential receptor (proposed or existing) predicted to experience odour concentrations above this criterion would be considered to be significantly impacted by odour from the proposed WwTW.

9.5.3 Modelling odour concentrations across a receptor grid allows odour contour plots to be produced, which show the extent of the area across which the benchmark level of $C_{98,\ 1\text{-hour}}$ $3ou_E/m^3$ is exceeded. These plots, which have been created for each year of meteorological data considered in the assessment, are included at Appendix 9.2.

9.5.4 The results of the modelling assessment predict that in all of the five years assessed, the majority of the Proposed Development is predicted to experience odour concentrations below the $C_{98,\ 1\text{-hour}}$ 3 ou_E/m^3 benchmark criteria.

9.5.5 In all five years assessed, small pockets of the Proposed Development are predicted to be affected by the $C_{98,\ 1\text{-hour}}$ 5-10 ou_E/m^3 odour contour. These very small areas are all located in close proximity to the proposed WwTW. It should be noted that the maximum odour concentration in all five years assessed is precited to be $C_{98,\ 1\text{-hour}}$ 6.43 ou_E/m^3.

9.5.6 In all five years assessed, a small area of the Proposed Development close to the proposed WwTW is predicted to be impacted by the $C_{98,\ 1\text{-hour}}$ 3-5 ou_E/m^3 odour contour. The odour composite drawing shows that this extends approximately 20m from the southern boundary of the proposed WwTW at the furthest point.

9.5.7 An odour composite drawing has been produced (Appendix 9.2) to show the $C_{98,\ 1\text{-hour}}$ 3ouE/m3 odour contours as a composite across the five years assessed.

9.5.8 The closest existing sensitive (residential) receptors are located to the north and north-east of the proposed WwTW, along Pound Lane. In all five years assessed, no existing sensitive receptor is predicted to be affected by the $C_{98,\ 1\text{-hour}}$ 3 ou_E/m^3 benchmark criterion.

9.5.9 A small number of existing residential receptors to the north, north-east and east are predicted to be affected by the $C_{98,\ 1\text{-hour}}$ 1.5 - 3 ou_E/m^3 odour contour in three of the five years assessed.

9.5.10 The highest predicted modelled concentrations at the existing receptors considered in the model are detailed in Table 9.5 below.

Table 9.5: Highest Modelled Odour Concentration at Existing Residential Receptors			
Name	**X**	**Y**	**Odour Concentration ($C_{98, 1\text{-hour}}$)**
ESR 1	599991	139554	1.19
ESR 2	600053	139419	1.87
ESR 3	600062	139412	1.85
ESR 4	600088	139391	1.80
ESR 5	600104	139346	1.69
ESR 6	600045	139492	1.83
ESR 7	600071	139463	1.60

Discussion of Results

Proposed Residential Receptors

9.5.11 The modelling assessment predicts that the majority of the Proposed Development will not experience an adverse odour impact and is suitable for residential development. The odour contour composite (Appendix 9.2) illustrates that the area to the south of the proposed WwTW is predicted to experience an odour impact within the $C_{98, 1\text{-hour}}$ 3 -5 ou_E/m^3 odour contours, which extend approximately 20m to from the southern boundary of the WwTW into the proposed residential area.

9.5.12 The same contour extends approximately 20m from the western boundary of the proposed WwTW, however, it is understood that residential dwellings are proposed only to the south of the WwTW.

9.5.13 In accordance with IAQM guidance, all residential development within the Proposed Development should be built outside of the $C_{98, 1\text{-hour}}$ 3 ou_E/m^3 benchmark criterion composite contour shown in Appendix 9.2. It is assumed that this can be achieved during detailed design when the exact locations of dwellings is determined.

9.5.14 Therefore, the effect of odour from the proposed WwTW on the Proposed Development Site as a whole is considered to be negligible. In accordance with IAQM guidance, this correlates to an overall **'not significant'** effect.

Existing Residential Receptors

9.5.15 No existing sensitive receptor is predicted to be affected by odours above the $C_{98, 1\text{-hour}}$ 3 ou_E/m^3 benchmark criterion.

9.5.16 It should be noted that, in one of the assessed years (2017), the $C_{98, 1\text{-hour}}$ 1.5 -3 ou_E/m^3 benchmark odour contours extend across a greater number of existing residential receptors to the east of the proposed WwTW when compared with the other assessed years. However, as shown in Table 9.5 above, all existing receptors are not predicted

to experience odour concentrations above $C_{98,\ 1\text{-hour}}$ 2 ou_E/m^3. In accordance with IAQM and EA H4 guidance, residential development is considered suitable within this contour as this correlates to a 'not significant' odour impact.

9.5.17 Therefore, the effect of odour from the proposed WwTW on existing residential receptors is considered to be negligible. In accordance with IAQM guidance, this correlates to an overall **'not significant'** effect.

9.6 MITIGATION

9.6.1 The impact of the Proposed Development is predicted to be 'not significant' in accordance with IAQM guidance. As all existing residential receptors lie outside of the $C_{98,\ 1\text{-hour}}$ 3 ou_E/m^3 benchmark criterion, and assuming that all proposed residential receptors within the Proposed Development will be built outside of this contour, no further mitigation measures are necessary.

9.6.2 It is understood that the proposed WwTW is to include landscaping surrounding the WwTW in the form of tree planting. The planting of trees and shrubs around the proposed WwTW will help mitigate any not-significant odour impact further by (i) acting as a visual buffer and help to obscure the WwTW from view of existing and proposed residents, and (ii) increasing the dilution of odours through increased vertical mixing and reducing the dispersion of odours across the Proposed Development site.

9.6.3 Therefore, although mitigation is not required, it is considered that the proposed landscaping around the WwTW will reduce any odour impact further, and any residual impact should be **not significant**.

9.7 ASSESSMENT OF CUMULATIVE EFFECTS

9.7.1 There are no cumulative effects to consider as part of this ES Chapter because there are no other significant odour sources surrounding the Proposed Development.

9.8 CONCLUSION

9.8.1 Odour dispersion modelling has been undertaken using AERMOD to consider the potential for odour effects from the proposed WwTW to be built in the north-western corner of the Proposed Development site.

9.8.2 Odour concentrations have been predicted across a receptor grid, which incorporates the entire Proposed Development site and surrounding area. This has allowed odour contour plots to be created for each of the five years of meteorological data

considered. The predicted odour concentrations have been compared against a benchmark level of $C_{98,\ 1\text{-hour}}$ 3ou_E/m^3.

9.8.3 The results of the assessment show that the majority of the Proposed Development site will not experience any adverse odour impact and is suitable for residential development. The odour contour composite (shown in Appendix 9.2) illustrates that the area to the south of the proposed WwTW is predicted to experience an odour impact within the $C_{98,\ 1\text{-hour}}$ 3 -5 ou_E/m^3 odour contours, which extend approximately 20m from the southern boundary of the WwTW into the proposed residential area.

9.8.4 In accordance with IAQM guidance, all residential development within the Proposed Development should be built outside of the $C_{98,\ 1\text{-hour}}$ 3 ou_E/m3 benchmark criterion composite contour shown in Appendix 9.2.

9.8.5 No existing sensitive receptor is predicted to be affected by odours above the $C_{98,\ 1\text{-hour}}$ 3 ouE/m3 benchmark criterion.

9.9 SUMMARY

9.9.1 The results of the detailed dispersion modelling predict that the majority of the Proposed Development site will lie outside of the $C_{98,\ 1\text{-hour}}$ 3 ou_E/m3 odour benchmark criterion contour. No proposed residential development will be built in areas closer to the proposed WwTW than this contour. All existing residential receptors lie outside of the $C_{98,\ 1\text{-hour}}$ 3 ou_E/m3 odour benchmark criterion contour.

9.9.2 It is considered that the effects of odour from proposed WwTW on the Proposed Development site as a whole, and existing residential receptors around the site, are negligible, which correlates to an overall '**not significant'** effect in accordance with national guidance.

10 CLIMATE CHANGE

10.1 Introduction

10.1.1 The climate change addendum serves to outline the climate impacts of the Proposed Development following the addition of a Waste Water Treatment Works (WwTW).

10.1.2 This chapter will evaluate how the inclusion of the WwTW could impact on climate change. Any significant impacts on the climate in relation to this project will arise from the release of greenhouse gases (GHG) into the atmosphere, thereby contributing to global warming and climate change. A simplified GHG assessment is used to quantify the emissions of the WwTW at this stage in the application.

10.1.3 In addition to this, there will be a brief discussion on the potential impacts of extreme weather events to evaluate how the inclusion of the WwTW influences the overall Proposed Development's resilience to Climate Change.

10.1.4 This addendum is not a standalone assessment and should be read in conjunction with the 2015 ES and 2017 and 2020 ES Addendums.

10.2 Baseline

10.2.1 The inclusion of the WwTW on site will allow wastewater created on site to be treated locally. It is assumed that the proposed system will be responsible for processing all wastewater being produced by personnel living on the development once it is complete, this corresponds to the number of persons occupying 550 residential homes. The average household size in the UK is 2.4 with the average person using 142 litres of water each day, with 25% and 22% of that consumption being allocated to the use of showers and lavatories, respectively.

10.2.2 The Ashford Borough Council (ABC) local plan adopted in 2019 specifies that each person in a residential development should use no more than 110 litres of water per day under policy ENV7 – water efficiency.

10.2.3 Based upon the assumptions above and the consumption quota outlined in policy ENV7, the newly added WwTW will be responsible for processing wastewater from 1,320 people. This corresponds to a daily process quantity of 145,200 litres and an annual quantity of 52,998,600 litres. That is 145.20 m3 and 52,998.60 m3 of waste, respectively.

10.3 Climate Impact

10.3.1 At this stage in the outline application, the impact of the WwTW on the climate will be assessed using a baseline figure. This method is based on a nationally recognised emissions factors published by the UK government for mains water treatment[1].

Table 10.1 GHG emissions from Waste Water Treatment Works

UK Conversion Factor	KgCO2e / m3	0.272
Daily water consumption	/m3	145.20
Annual water consumption	/m3	52,988.60
Daily emissions	KgCO2e	39.49
Annual emissions	KgCO2e	14,412.74

10.3.2 The addition of the WwTW will coincide with an estimated annual emission of 14.41 tonnes of CO_2e per annum. It is worth noting, that there is an uncertainty underlying this method that may likely result in a significant difference in observed emissions following a more detailed study. This can be attributed to factors like a difference in scale and technology of the WwTW used in the proposed scheme, in contrast to the referenced municipal wastewater treatment plant used in the UK governments assessment of WwTW conversion factors. In simple terms, should the emissions from the WwTW exceed the emissions associated with the existing local water treatment infrastructure then this may result in significant effects.

10.3.3 This methodology is considered to be the most appropriate at this stage given that all matters related to the WwTW are reserved. The implementation of the WwTW is not considered to alter the current assessment of significance. At the reserved matters stage, the current assessment of significance may need to be reviewed after a more detailed assessment of GHG emissions arising from the WwTW has been calculated and referenced against the baseline. If there is a net negative difference between the baseline and absolute emissions, then we would be required to change the assessment of emissions arising from the WwTW from not significant to significant and recommend suitable emissions mitigation measures where applicable. This is not considered likely at this stage.

[1] DBEIS, Greenhouse gas reporting: conversion factors 2022, 8 June 2022 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/990661/conversion-factors-2022-condensed-set-most-users.xlsm

Table 10.2 Comparison of baseline and absolute emissions scenarios per annum			
Baseline Emissions (kgCO2e)	Absolute emissions (kgCO2e)	Relative emissions	
		(kgCO2e)	%
14,412.74	14,412.74	0.00	0%

10.4 Climate Resilience

10.4.1 This section of the assessment builds on the prior climate assessments to evaluate how the inclusion of WwTW influences the Proposed Development's resilience to Climate Change. The addition of the WwTW at the Proposed Development will have a negligible impact on the:

- Project type (type of development remains unchanged; school, dwellings etc)
- Project size (land use and size requirements; WwTW added within site boundary)
- Project timescales (life span for construction, operation, decommissioning)

10.4.2 The original assessment of the proposed scheme has considered the factors above in the Climate Resilience assessment and presented suitable resilience measures. Given the negligible impacts highlighted above on the project type, size and timescale the resilience of the Proposed Development to impacts from climate change will remain unchanged from the original assessment.

11 SUMMARY

11.1.1 This ES Addendum has been prepared to consider whether the technical assessments reported within the 2015 ES and subsequent 2017 and 2020 Addendums would be affected by the proposed amendments to the Kingsnorth Green proposals.

11.1.2 The proposed changes relate to the inclusion of a WwTW in the northwest of Area 1 and this ES Addendum considers whether this gives rise to materially new or materially different environmental effects to those previously assessed and reported within the 2015 ES, 2017 ES Addendum and 2020 ES Addendum.

11.1.3 New or additional effects were identified in relation to air quality, noise and water resources. No additional effects were identified in relation to the remaining technical assessments and therefore the conclusions and effects identified in the previous 2015 ES and 2017 and 2020 Addendums remain valid.

11.1.4 Odour dispersion modelling concluded that the effect of odour resulting from the proposed WwTW on existing and future receptors is negligible and in accordance with IAQM guidance is a **'not significant'** effect.

11.1.5 An industrial noise impact assessment was carried out in accordance with BS4142 to determine the level of effect resulting from the inclusion of the WwTW on sensitive receptors. Following the implementation of mitigation measures there effects will be negligible and **'not significant'.**

11.1.6 The inclusion of the WwTW is identified as a mitigation measure following a Nutrient Neutrality Assessment to avoid any potential further deterioration in water quality of the Stodmarsh European Designated Site as a result of eutrophication.

11.1.7 A nutrient neutrality assessment identified that without mitigation there would be a surplus of nutrients as a result of the proposed development compared to the nutrient loading from the land prior to development. The implementation of a nutrient neutrality mitigation strategy which includes the inclusion of the proposed WwTW and SuDS will result in residual effects which are **'not significant'**.

11.2 Conclusion

11.2.1 The amended scheme does not result in any new or materially different significant effects, and mitigation measures will be implemented to reduce or avoid potentially significant adverse effects on the environment. Therefore, the previous conclusions of the 2015 ES and 2017 and 2020 Addendums remain valid.

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