11 Ecology

11.1 Introduction

11.1.1 This Chapter assesses the likely significant ecological effects resulting from the K3 Proposed Development and WKN Proposed Development.

11.2 Regulatory and Policy Framework

Relevant Legislation

Wildlife and Countryside Act 1981 (as amended)

11.2.1 The Wildlife and Countryside Act (WCA) 1981 (as amended) is the principal legislative protection for wildlife within England. It establishes protection for certain species of plant and animals and allowed for the protection in law of various designated sites. It also consolidated and amended earlier national legislation to implement the European Directive 2009/147/EC on the conservation of wild birds – (The Birds Directive) in the UK. Individual species receive different levels of protection under the act. Special Protection Areas (SPAs) were designated under the WCA 1981 where sites and their habitats support significant numbers of wild birds.

Conservation of Habitats and Species Regulations 2017

11.2.2 The WCA 1981 is complemented by the Conservation of Habitats and Species Regulations 2017 (hereafter referred to as The Habitat Regulations). This is the most recent legislation to implement in law the European Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora - (Habitats Directive) adopted in 1992. The 2017 legislation supersedes the earlier legislation from 2010 and 1994 which were subject to a series of amendments.

11.2.3 Individual species (such as otter *Lutra lutra* and dormouse *Muscardinus avellanarius*) and species groups (all native UK bat *Chiroptera* species) receive a high level of protection under the Habitat Regulations.

11.2.4 The regulations require the potential effects on European Protected Habitats to be a key consideration in planning decisions. If it is likely that the designated features have the potential to be impacted, then an appropriate assessment is required under Article 6(3) of the Habitats Directive with consideration of mitigation options to avoid adverse effects. If uncertainty remains over a potentially significant effect, then alternative solutions need to be considered.

Countryside and Rights of Way Act 2000

11.2.5 The WCA 1981 has been amended and reinforced in England and Wales by the Countryside and Rights of Way Act (CRoW) Act 2000 (as amended). The CRoW

Act increases protection for Sites of Special Scientific Interest (SSSI) as well as strengthening wildlife enforcement legislation.

11.2.6 The CRoW Act places a duty on the Government to have regard for the conservation of biodiversity and to maintain lists of species and habitats for which conservation action should be taken or promoted, in accordance with the Convention on Biological Diversity. Schedule 9 of the CRoW Act amends the WCA 1981 by altering the notification procedures for SSSIs and providing increased powers for their protection and management.

Natural Environment and Rural Communities Act 2006

11.2.7 The Natural Environment and Rural Communities (NERC) Act 2006 places a duty on all public authorities to have regard to the purpose of conserving biodiversity.

11.2.8 Section 40 of the NERC Act 2006 imposes a duty on all public bodies including local and national government to have regard to biodiversity in the exercise of all of their functions, with particular regard to the species of conservation priority and is often referred to as 'the biodiversity duty'.

11.2.9 In England, Section 41 (S41) of the Act lists the species and habitats of highest importance for conserving biodiversity (derived from the original UK Biodiversity Action Plan (BAP) priorities). The S41 list is a definitive reference for all public bodies in England (statutory and non-statutory) and is a guide for decision-makers when implementing their statutory duties to have regard to the conservation of biodiversity. This 'biodiversity duty' includes taking steps to promote the restoration and enhancement of the populations of S41 species.

11.2.10 Section 41 species include a number of native bat species (including greater horseshoe bat *Rhinolophus ferrumequinum* and lesser horseshoe bat Rhinolophus hipposideros, noctule *Nyctalus noctula*, soprano pipistrelle *Pipistrellus pygmaeus*, and brown long-eared bat *Plecotus auritus*), dormouse *Muscardinus avellanarius*, hedgehog *Erinaceus europaeus*, brown hare *Lepus europaeus*, a number of bird species associated with grassland and woodland habitats, and slow-worm *Anguis fragilis*, and great crested newt *Triturus cristatus* amongst others. All these species are of conservation concern and have suffered long-term population declines.

Marine and Coastal Access Act (MCAA) 2009

11.2.11 As well as replacing consents under the Food and Environment Protection Agency (FEPA) 1985 and the Coast Protection Act (CPA) 1949, the MCAA 2009 also introduced a new planning system for marine environmental management and a requirement to obtain Marine Licences for works at sea.

11.2.12 The MCAA also enable the designation of Marine Conservation Zones (MCZs) in the territorial waters adjacent to England and Wales and UK offshore waters. The purpose of these conservation measures is to halt the deterioration of the state of the UK's marine biodiversity and promote recovery where appropriate, support healthy ecosystem functioning and provide the legal mechanism to deliver our current European and international marine conservation commitments, such as those laid out under the Marine Strategy Framework Directive (MSFD), OSPAR Convention and Convention on Biological Diversity.

Planning Policies

Overarching National Policy Statement (NPS) for Energy (EN-1)

11.2.1 Section 5.3 of the Overarching National Policy Statement for Energy (EN-1) *Biodiversity and geological conservation* sets out the potential impacts associated with infrastructure development, what should be included in an ES and the role of the IPC (now the Secretary of State) in decision making and mitigation.

11.2.2 Section 5.2 of the NPS Air Quality and Emissions sets out that infrastructure development should take account of the potential effects from emissions to air on ecological receptors.

National Planning Policy Framework (NPPF)

11.2.3 The National Planning Policy Framework (NPPF) was first published on 27th March 2012 and subsequently revised in July 2018 to provide a simplified and streamlined single document to replace previous national planning policy [Ref 11.1].

11.2.4 The principle of sustainable development enshrined in the NPPF acknowledges the environmental role of planning in protecting and enhancing the natural environment and helping to improve biodiversity. The NPPF recognises that achieving sustainable development involves pursuing positive improvements in the natural environment including: '…moving from a net-loss of biodiversity to achieving net gains for nature'.

11.2.5 Chapter 15 of the NPPF 'Conserving and enhancing the natural environment' contains provisions for ensuring that planning can be sustainable from an environmental perspective. Specifically, Chapter 15 states that: '…*the planning system should contribute to and enhance the natural and local environment by*:

- *protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan)*;
- *recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland*;
- *maintaining the character of the undeveloped coast, while improving public access to it where appropriate;*
- *minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;*
- *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 land instability. Development should, wherever possible, help to improve local environmental conditions*

such as air and water quality, taking into account relevant information such as river basin management plans; and

- *Remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.'*

11.2.6 Paragraph 175 goes on to state that: "*When determining planning applications, local planning authorities should apply the following principles*:

- *if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts) adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;*

- *development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;*

- *development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons58 and a suitable compensation strategy exists; and*

- *development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity.*

11.2.7 Paragraph 176 provides that "*the following should be given the same protection as European sites:*

- *potential Special Protection Areas and possible Special Areas of Conservation;*

- *listed or proposed Ramsar sites; and*

- *sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.*

11.2.8 Finally, the NPPF states that (paragraph 177) "*The presumption in favour of sustainable development does not apply where development requiring appropriate assessment because of its potential impact on a habitats site is being planned or determined*".

11.2.9 The NPPF is supported by the Government Circular: Biodiversity and Geological Conservation – Statutory Obligations and their Effect within the Planning System, jointly issued by the Office of the Deputy Prime Minister and the Department of

Food and Rural Affairs [Ref 11.2]. This joint circular aims to provide 'guidance on the application of the law in relation to planning and nature conservation as it applies in England'. Additional guidance is provided in Planning for Biodiversity and Geological Conservation: A Guide to Good Practice [Ref 11.3] which provides case studies and examples to help comply with the legal requirements set out in the circular.

11.2.10 The Government Circular makes reference to the UK BAP, England Biodiversity Strategy and Local Biodiversity Partnerships. These documents outline strategic actions for biodiversity at both the national and local level and are considered further below under Wildlife Legislation.

National Planning Practice Guidance (NPPG)

11.2.11 The National Planning Practice Guidance (NPPG) was issued on-line in March 2014 and is updated periodically by government as a live document. The Natural Environment section of the guidance provides information on when biodiversity should be considered in an application: Information on biodiversity impacts and opportunities should inform all stages of development (including, for instance, site selection and design including any pre-application consultation as well as the application itself).

11.2.12 It also makes clear that development should deliver enhancement for biodiversity by:

- *habitat restoration, re-creation and expansion;*
- *improved links between existing sites;*
- *buffering of existing important sites;*
- *new biodiversity features within development; and*
- *securing management for long term enhancement*

11.2.13 The NPPG also provides guidance on action with respect to the application of the mitigation hierarchy:

- *in cases where biodiversity may be affected, is any further information needed to meet statutory obligations as signposted in guidance published by Defra/Natural England*
- *where an Environmental Impact Assessment has been undertaken, what evidence on ecological effects has already been provided in the Environmental Report and is this sufficient without having to undertake more work?*
- *is the significance of the effects clear? And*
- *is relevant internal or external expertise available?*

- *Avoidance – can significant harm to wildlife species and habitats be avoided for example through locating on an alternative site with less harmful impacts?*

- *Mitigation – where significant harm cannot be wholly or partially avoided, can it be minimised by design or by the use of effective mitigation measures that can be secured by, for example, conditions or planning obligations?*

- *Compensation – where, despite whatever mitigation would be effective, there would still be significant residual harm, as a last resort, can this be properly compensated for by measures to provide for an equivalent value of biodiversity?*

Kent Environmental Strategy 2016

11.2.14 The Kent Environmental Strategy has adopted an integrated approach where it is informed by, but does not duplicate, priorities and actions from other strategies in key areas of environment, growth, economy and health across partner organisations. The focus of this strategy is to draw together priorities which we need to address in partnership and not in isolation. Underpinning the strategy is the Kent Environment Strategy Implementation Plan, which provides the detailed actions for delivering on our priorities. These actions have been identified through stakeholder engagement, workshops and reviews. The strategy is split into three themes:

- Theme One: Building the foundations for delivery;

- Theme Two: Making best use of existing resources and minimising negative impacts; and

- Theme Three: Toward a sustainable future.

11.2.15 The overall outcomes are for Kent to make all sectors aware of their impact on the environment and how to avoid or reduce this through evidence-based decision making, reducing resource usage and wasting less. Whilst actively addressing the risks, impacts and opportunities from environmental and climate change, whilst delivering wider economic and health opportunities.

Kent Biodiversity Action Plan

11.2.16 The Kent BAP [Ref 11.4] was adopted in 2009 and lists species and habitats that are identified as priorities for action within Kent. The following species and habitats covered in this assessment are listed as priorities in the Kent BAP:

- *Slow worm; and*

- *Common lizard.*

Local Plan- Bearing Fruits 2031: The Swale Borough Local Plan

11.2.17 Swale Borough Council adopted the Swale Borough Local Plan in 2017 [Ref 11.5], following publication for comment to the general public in mid-2015 and further modifications made in 2016 and 2017. There are a number of policies which relate to biodiversity/ecology:

11.2.18 Policy CP4 – Requiring Good Design:

- *Conserve and enhance landscape, biodiversity and local environments by:*
    - *retaining trees where possible (including old orchards and fruit trees, hedgerows, shelter belts, woodland and scrub) particularly those that make an important contribution either to the amenity, historic, landscape character or biodiversity value of the site or the surrounding area;*
    - *provide features and management intended to encourage biodiversity.*

11.2.19 Policy CP7: Conserving and Enhancing the Natural Environment – Providing Green Infrastructure:

- *The Council will work with partners and developers to ensure the protection, enhancement and delivery, as appropriate, of the Swale natural assets and green infrastructure network and its associated strategy.*
- *'Ensure that there is no adverse effect on the integrity of a SAC, SPA or Ramsar site, alone or in combination with other plan and projects, as it would not be in accordance with the aims and objectives of this Local Plan'*
- *'Require the completion of project specific Habitats Regulations Assessment, in accordance with Policy DM28, to ensure there are no likely significant effects upon any European designated site.*
- *Contribute to the objectives of the Nature Partnerships and Nature Improvement Areas in Kent*
- *Make the enhancement of biodiversity and landscape as their primary purpose*

11.2.20 Policy DM 19- Sustainable Design and Construction:

- *Demonstration of a contribution to the network of green infrastructure and biodiversity, including through tree planting, green roofs and walls, soft landscaping and sustainable drainage systems as appropriate in accordance with Policy CP 7*

11.2.21 Policy DM22- The Coast:

- *The protection, enhancement or management as appropriate of biodiversity, landscape, seascape, and coastal processes.*

11.2.22 Policy DM28 – Biodiversity and Geological Conservation:

- *Policy DM 28 seeks to reflect the relative weight to be applied to the range of international, national and local designations and irreplaceable habitats present within Swale with the aim of requiring development to include the conservation and enhancement of biodiversity. In line with national planning policy it looks for any harm from development to be avoided, mitigated or as a last resort, compensated for. The Council will consider whether to roll out Biodiversity Offsetting once national pilots are completed and assessed.*

Swale Biodiversity Action Plan

11.2.23 The Swale Biodiversity Action Plan (BAP) [Ref 11.6] identifies habitats and species of conservation importance with the aim of enabling the conservation and enhancement of biodiversity within the Swale Borough contributing to the maintenance of national and global biodiversity. The Swale BAP priority habitats found at Kemsley include Built-up areas and Gardens, with Priority species including birds and bats.

11.3 Methodology

Scoping and Consultation

11.3.1 The formal scoping exercise is summarised in Chapter 3.

11.3.2 All the issues raised within the consultee responses to the ES Scoping Opinion and S42 Consultation are addressed within this Chapter.

11.3.3 In addition to the formal consultation, the WKN Proposed Development was discussed with Natural England via their Discretionary Advice Service with a site meeting on the 4th September 2018. Natural England subsequently provided written advice (dated 8th October 2018 – Appendix 11.6), the contents of which have also been used to inform the scope of the assessment in this Chapter.

Establishing Baseline Conditions

11.3.4 A considerable body of survey data in relation to ecology has been gathered with respect to the K3 Site and surrounding area. Methods for such survey work are described in detail in Appendix 11.1 and 11.3 and briefly below, as required.

Data Search

11.3.5 A desk-based study was conducted in 2018 to gather information with respect to existing background information. This involved contacting statutory and non-statutory groups for information on species and sites of nature conservation interest. The organisations contacted were:

- Kent and Medway Biological Records Centre (KMBRC);
- The Kent Field Club;

- Kent Ornithological Society (KOS); and
- The Kent Wildlife Trust.

11.3.6 A review of existing statutory sites of nature conservation interest, such as Sites of Special Scientific Interest (SSSIs), Special Protection Areas (SPAs), Special Area of Conservation (SACs), MCZs and National Nature Reserves (NNRs), and non-statutory sites, such as Sites of Nature Conservation Interest (SNCIs) was carried out to help indicate any existing nature conservation interest within 10 km of the DCO boundary A plan showing the location of existing statutory designations relative to the DCO boundary is provided as Figure 11.1.

11.3.7 All information received on species in the search area was reviewed and is summarised in this report. All records of protected species within 2 km of the DCO boundary are shown on Figure 11.2.

Phase 1 Habitat Survey

11.3.8 A habitat survey of the K3 Site and WKN Site was conducted in accordance with The Handbook for Phase 1 Habitat Survey [Ref 11.7] in 2009, and included searches for signs of protected species, as described in the Guidelines for Preliminary Ecological Assessment [Ref 11.8]. A Phase I Habitat Survey Map is provided as Figure 11.3.

11.3.9 The intertidal area of The Swale where the surface water outfall is to be located (Works Areas 1E and 7) was surveyed in 2017 (Appendix 11.7).

11.3.10 A further survey of the K3 Site and WKN Site and surrounding area (including areas comprising Works No. 6-7 not originally surveyed in 2009) was undertaken on 11th October 2018 by an experienced ecologist, Nicholas Betson CEnv MCIEEM. Habitats within the Sites were classified, mapped and described, with respect to their structure and floristic composition.

11.3.11 During each survey, all habitats within the survey area were assessed for their potential to support legally protected or otherwise notable flora and fauna. Where suitable habitat was identified on site, a search was conducted for signs indicating the presence of protected species such as droppings, burrows, tracks and evidence of feeding. Where species are not specifically evaluated, this indicates that no habitat of potential value for these species was identified during the survey.

11.3.12 Consideration was also given to habitats outside the site, in order to evaluate the ecological context of the site within the wider landscape. Adjacent habitats were also considered with respect to their own ecological value and their potential to enhance the ecological value of habitats within the Sites.

11.3.13 Searches were made for invasive non-native plant species focussing on those species currently listed in the revised Schedule 9 of the Wildlife and Countryside Act 1981 (as amended).

11.3.14 The plant species nomenclature follows that of Stace [Ref 11.9]. Plant species observed within each habitat type were recorded using the DAFOR system which stands for Dominant, Abundant, Frequent, Occasional or Rare.

Reptile Surveys

11.3.15 Reptile surveys have been undertaken across the DCO boundary in suitable habitat in 2009 and 2018. These were carried out in accordance with the recommended methodology outlined in the Herpetofauna Workers' Manual [Ref 11.10] and Froglife's Advice Sheet 10 (1999) [Ref 11.11]. The surveys were undertaken, between April and October (an optimum time for such surveys), by experienced ecologists.

11.3.16 The survey was conducted using artificial refugia made from roofing felt measuring 50 cm x 50 cm. These provide shelter and basking opportunities for reptiles, which can be recorded on or under the refugia during suitable weather conditions, i.e. avoiding periods of strong wind, heavy rain or extreme temperatures; typically, surveys are undertaken when the air temperature is between 9 and 18°C.

The survey results will be used to estimate the population size classes for each of the reptile species recorded and to assess whether or not the site could be classified as a Key Reptile Site, as defined by Froglife (1999) [Ref 11.11].Bird surveys

11.3.17 Full details of the methodologies for bird surveys undertaken (both breeding and intertidal) can be found in Appendix 11.1.

Invertebrate surveys

11.3.18 Full details of the methodologies for the invertebrate surveys can be found in Appendix 11.3..

Water Vole surveys

11.3.19 Water Vole surveys were undertaken of ditches within the DCO boundary in both 2009 and 2018, as necessary. in accordance with the recommendations as detailed in the Water Vole Conservation Handbook.

11.3.20 Water vole surveys require both banks of the ditch to be walked with the surveyor recording any signs of water vole activity. Such signs include:

- visual sightings / sounds of voles entering the water;
- latrines, showing discrete piles of droppings;
- tunnel entrances;
- 'lawns' around tunnel entrances;
- feeding remains of chopped vegetation;
- paths and runs at water's edge or in vegetation; and
- footprints in mud.

Significance Criteria

Receptor Sensitivity – Identification of Ecological Receptors

11.3.21 Several factors are taken into consideration when assessing the value of an ecological feature and whether it is considered important and therefore requires detailed assessment of potential impacts.

11.3.22 In assessing the value of habitats or species populations, a subjective assessment is made, based on a range of factors that influence overall ecological value. Amongst other factors, a series of criteria are considered for habitats and populations of species including: fragility, rarity, extent, diversity, position in the landscape, naturalness, and recorded history. The legal protection of species is not a primary consideration in determining conservation value, but it is an important consideration in the impact assessment process.

11.3.23 Other resources that are used to inform the assessment of value and importance include but are not limited to:

- EU Directives;
- Habitats and Species of Principal Importance (Section 41);
- Birds of Conservation Concern (BoCC) Red and Amber lists [Ref 11.16];
- National and County Red Data Book species.

11.3.24 The resources used to assess the value and importance of features also helps to define the importance in the context of geographical scale. The CIEEM guidelines [Ref 11.17] state that significance of effects of ecological features should be qualified with reference to the appropriate geographic scale. Therefore, to provide a framework that is consistent for both assessing the importance of ecological features and determining the significance of effects, the importance of ecological features is described at one of the following geographic scales:

- International;
- National;
- Regional;
- Local; and
- Site and immediate surroundings.

11.3.25 The use of a matrix with respect to the impact assessment has been adopted here for the sake of consistency across the ES, with the CIEEM geographical scale included as far as possible within this method as set out in Table 11.1.

Value of Ecological Receptors	Description
Negligible	Including site level importance Commonplace feature of little or no habitat/historical significance. Loss of such a feature would not be seen as detrimental to the ecology of the area.
Low	Including local importance. A feature (e.g. habitat or population) that is of nature conservation value in a local context only, with insufficient value to merit a formal nature conservation designation.
Medium	Including regional or county importance. A feature (e.g. habitat or population), which is either unique or sufficiently unusual to be considered as being of nature conservation value from a county to regional level. Habitats or species that form part of the cited interest of a Local Nature Reserve (LNR), or some local-level designated sites, such as a Local Wildlife Site (LWS), also referred to as a non-statutory Site of Importance for Nature Conservation (SINC) or the equivalent, e.g., Ancient Woodland designation. Presence of Local Biodiversity Action Plan (LBAP) habitats or species, where the action plan states that all areas of representative habitat or individuals of the species should be protected.
High	Including national importance. Habitats or species that form part of the cited interest within a nationally designated site, such as an SSSI or a (National Nature Reserve (NNR). A feature (e.g., habitat or population) which is either unique or sufficiently unusual to be considered as being one of the highest quality examples in a national context for which the site could potentially be designated as a SSSI. Presence of UKBAP habitats or species, where the action plan states that all areas of representative habitat or individuals of the species should be protected.
Very high	Including international importance Habitats or species that form part of the cited interest within an internationally protected site, such as those designated under the Habitats Directive (e.g., SACs) or other international convention (e.g., Ramsar site). A feature (e.g. habitat or population) which is either unique or sufficiently unusual to be considered as being one of the highest quality examples in an international/national context, such that the site is likely to be designated as a site of European importance (e.g., SAC).

Table 11.1: Value of Ecological Receptors

Magnitude of Impact

11.3.26 The significance of important impacts is assessed in the context of the baseline.

11.3.27 Impacts may be described in terms of changes to the structure or function of a ecological resource and are characterised according to a number of parameters where these are relevant to understanding ecological effect. These parameters include:

- Beneficial or adverse – impacts may be either, depending on the nature of the impact.
- Extent- the geographical range over which the impact occurs.
- Magnitude – the size of the impact in terms of amount of a feature affected.
- Duration and timing – when the effect will occur and how long it will last.
- Frequency – whether the effect will be a single event or multiple events.
- Reversibility – the effect may be permanent, or may naturally reverse without mitigation, or may be reversible with appropriate mitigation.

11.3.28 Table 11.2 below indicates how the magnitude of impacts has been described within this assessment.

Magnitude	Criteria
High	Adverse - Loss of resource and/or quality and integrity of resource: severe damage to key characteristics, features or elements. Detrimental effect on conservation status. Beneficial - Large scale or substantial improvement of resource quality: extensive restoration or enhancement: substantial improvement of attribute quality. Notable improvement in conservation status.
Medium	Adverse – Loss of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements. Some detriment to conservation status. Beneficial – Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality. Some improvement to conservation status.
Low	Adverse – Some measurable change in attributes, quality or vulnerability; slight loss of, or alteration to, one (maybe more) key characteristics, features or elements. Beneficial – Slight benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact or attribute or a reduced risk of negative impact occurring.
Negligible	Adverse – Very slight loss or detrimental alteration to one or more characteristics, features or elements. Beneficial – Very slight benefit to or positive addition of one or more characteristics, features or elements.
No change	No loss or alteration of characteristics, features or elements; no observable impact in either direction

Table 11.2: Magnitude of Impacts

Significance of Effects

11.3.29 A professional judgement of significance is made based on the interaction between the importance of the ecological feature (at the geographical scale) and the characterisation of the effect (such as magnitude, extent, reversibility, etc.).

11.3.30 Broadly, effects are considered significant where they affect the structure of sites, habitats and ecosystems or the conservation status of habitats and species with the scale of that significance dependent upon the balance between the sensitivity of the feature and the magnitude of impact (Table 11.3).

Value	Magnitude of impact				
	No Change	Negligible	Low	Medium	High
Negligible	No change	Negligible	Negligible or Slight	Negligible or Slight	Slight
Low	No change	Negligible or Slight	Negligible or Slight	Slight	Slight or Moderate
Medium	No change	Negligible or Slight	Slight	Moderate	Moderate or Substantial
High	No change	Slight	Slight or Moderate	Moderate or Substantial	Substantial or very Substantial
Very high	No change	Slight	Moderate or Substantial	Substantial or Very Substantial	Very substantial

Table 11.3: Assessment Matrix for the Significance of Ecological Effects

11.3.31 An effect that is moderate, Substantial, or Very Substantial, is generally considered significant.

11.3.32 Several impacts of varying magnitudes could act on a feature simultaneously. Therefore, for each feature, a single overall level of impact significance is presented for the construction, operation and decommissioning phases (as relevant) based on the most significant effect identified for that feature.

11.3.33 For consistency between disciplines the overall significance of an effect is expressed as Negligible, Slight, Moderate, Substantial or Very Substantial based on the definitions below:

- Very Substantial: Only adverse effects are normally assigned this level of significance. They represent key factors in the decision-making process. These effects are generally, but not exclusively, associated with sites or features of international, national or regional importance that are likely to suffer a most damaging impact and loss of resource integrity. However, a substantial change in a site or feature of local importance may also enter this category.

- Substantial: These beneficial or adverse effects are considered to be very important considerations and are likely to be material in the decision-making process.

- Moderate: These beneficial or adverse effects may be important but are not likely to be key decision-making factors. The cumulative effects of such factors may influence decision-making if they lead to an increase in the overall adverse effect on a particular resource or receptor.

- Slight: These beneficial or adverse effects may be raised as local factors. They are unlikely to be critical in the decision-making process but are important in enhancing the subsequent design of the project.

- Negligible: No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

Assessment of Effects

11.3.1 The Ecological Impact Assessment (EclA) in this chapter follows the most recent published guidance from the Chartered Institute of Ecology and Environmental Management [Ref 11.16]. The updated guidance aims to promote good practice in the assessment of ecological impacts in terrestrial, freshwater and marine environments in the UK.

Limitations and Assumptions

11.3.2 The ecology of the Kemsley Paper Mill site and surrounding area has been studied by RPS for over 10 years and the issues present are well known to both RPS and consultees. Surveys have been undertaken at appropriate times of the year such that any potential protected species would be identified.

11.3.3 Impacts on ecology receptors from changes to noise and air quality rely on the models produced for those subjects. As such, the conclusions with respect to ecology also rely on the assumptions that underpin those models as set out in Chapters 5 Air Quality and 7 Noise and Vibration.

11.3.4 Therefore, the assessment is considered to be based on sound ecological data and, as such, suitably robust.

11.4 Baseline Conditions

11.4.1 At the time of scoping, the intention was to apply for an extension to K3 as consented to comprise a power upgrade from 49.9MW to 75MW and an increase in annual permissible waste throughput of 107,000tpa. Whilst this remains the practical effect of the DCO application, in order to accord with the Planning Act 2008 the DCO application seeks permission for the construction and operation of a 75MW generating station with a total annual throughput of 657,000 tpa (i.e. the development as a whole including K3 as already consented by the planning permission dated 6 March 2012 granted by Kent County Council, together with subsequent material and non-material variations thereto). Full details are provided in Chapter 2.

11.4.2 The effects of the construction and operation of K3 as consented was assessed in the EIA submitted in support of its consent, and is avaible in the 2010 Ecology and Nature Conservation Chapter of the Environmental Statement (RPS, 2010) that support the application (see Document 3.2).

11.4.3 The zone of influence of the K3 Proposed Development and WKN Proposed Development is assumed to be 10 km to ensure that all sites of international importance that could be subject to effects are included in the assessment, in line with EA guidance on the consideration of air quality effects on designated sites

[Ref 11.13]. The smaller 2 km radius used for the nationally-designated sites is in line with industry best-practice.

11.4.4 Prior to the construction of K3 as consented, the DCO boundary comprised a variety of habitats, including dense scrub, unimproved neutral grassland, tall ruderal, swamp, scattered scrub, hardstanding and ephemeral/ short perennial.

11.4.5 Currently, however, the K3 Site is advanced in terms of construction and anticipated to become fully operational in accordance with its extant planning permission by the end of 2019 and before the examination of the proposed Development Consent Order for the K3 Proposed Development and WKN Proposed Development.

11.4.6 The WKN Site is currently used as a laydown area for the construction of K3 as consented. Therefore, it was historically expected to be returned to its original state (scrub / grassland / rubble mosaic). The WKN Proposed Development baseline will therefore be the WKN Site, as existed prior to the use of the WKN Site as laydown, as informed by the surveys completed at the time, as described in Appendix 11.3. This is considered a worst-case scenario as it allows the WKN Proposed Development to account for the loss of habitat that occurred during the original site clearance.

Desk Study

Designated Sites

11.4.7 There are eight internationally-designated sites within 10 km of the assessment boundary (Figure 11.1):

- The Swale Special Protection Area (SPA) – 0.16 km east;
- The Swale Ramsar – 0.16 km south east;
- Medway Estuary and Marshes SPA – 2.1 km north;
- Medway Estuary and Marshes Ramsar – 2.1 km north;
- Thames Estuary and Marshes SPA – 8.7 km north west;
- Thames Estuary and Marshes Ramsar – 8.7 km north west;
- Queensdown Warren SAC – 9.3 km south west; and
- Outer Thames Estuary SPA – 8.0 km north-east.

11.4.8 There are four nationally-designated sites and one locally-designated site located within 2 km:

- The Swale Marine Conservation Zone (MCZ) – 0.02 km south;
- The Swale Site of Special Scientific Interest (SSSI) – 0.13 km south east;

- Medway Estuary and Marshes SSSI - 2.1 km north;
- Elmley National Nature Reserve (NNR) – 0.4 km north-east;
- Milton Creek Local Wildlife Site (LWS) – 0.13 km south-east.

11.4.9 The Swale SPA, Ramsar and SSSI are located on the south side of the outer part of the Thames Estuary in south-eastern England. The Swale is an estuarine area that separates the Isle of Sheppey from the Kent mainland. To the west it adjoins the Medway Estuary. It is a complex of brackish and freshwater, floodplain grazing marsh with ditches, and intertidal saltmarshes and mud-flats. It has received its designation for supporting populations of European important species, including breeding populations of Avocet *Recurvirostra avosetta*, Marsh Harrier *Circus aeruginosus* and Mediterranean Gull *Larus melanocephalus*, and over-wintering populations of Bar-tailed Godwit *Limosa lapponica*, Golden Plover *Pluvialis apricaria* and Hen Harrier *Circus cyaneus*.

11.4.10 Medway Estuary and Marshes SPA, Ramsar and SSSI feed into and lie on the south side of the outer Thames Estuary in Kent, southeast England. It forms a single tidal system with The Swale and joins the Thames Estuary between the Isle of Grain and Sheerness. It has a complex arrangement of tidal channels, which drain around large islands of saltmarsh and peninsulas of grazing marsh. The mud-flats are rich in invertebrates and also support beds of Enteromorpha and some Eelgrass *Zostera spp*. Small shell beaches occur, particularly in the outer part of the estuary. Grazing marshes are present inside the sea walls around the estuary. The complex and diverse mixes of coastal habitats support important numbers of waterbirds throughout the year. In summer, the estuary supports breeding waders and terns, whilst in winter it holds important numbers of geese, ducks, grebes and waders. The site is also of importance during spring and autumn migration periods, especially for waders.

11.4.11 The Thames Estuary and Marshes SPA is located on the south side of the Thames Estuary in southern England. The marshes extend for about 15 km along the south side of the estuary and also include intertidal areas on the north side of the estuary. To the south of the river, much of the area is brackish grazing marsh, although some of this has been converted to arable use. At Cliffe, there are flooded clay and chalk pits, some of which have been infilled with dredgings. Outside the sea wall, there is a small extent of saltmarsh and broad intertidal mud-flats. The estuary and adjacent grazing marsh areas are wetlands of international importance as they support an important assemblage of wintering waterbirds including: Redshank *Tringa totanus*, Black-tailed Godwit *Limosa limosa islandica*, Dunlin *Calidris alpina alpina*, Lapwing *Vanellus vanellus*, Grey Plover *Pluvialis squatarola*, Shoveler *Anas clypeata*, Pintail *Anas acuta*, Gadwall *Anas strepera*, Shelduck *Tadorna tadorna*, White-fronted Goose *Anser albifrons albifrons*, Little Grebe *Tachybaptus ruficollis*, Ringed Plover *Charadrius hiaticula*, Avocet *Recurvirostra avosetta*, Whimbrel *Numenius phaeopus*. In addition to the waterbird species, the site also supports Hen Harrier *Circus cyaneus*, seven individuals representing at least 0.9% of the wintering population in Great Britain. The site is also important in spring and autumn migration periods.

11.4.12 The Thames Estuary and Marshes Ramsar site comprises the same area as the Thames Estuary and Marsh SPA and all the bird species named within the interest features. In addition to the bird species, the saltmarsh and grazing marsh are of

international importance for their diverse assemblage of wetland plants and invertebrates. The site supports one endangered plants species and at least 14 nationally scarce plants of wetland habitat. The site also supports more than 20 British Red Data Book invertebrates.

11.4.13 The Queendown Warren SAC is located south of Rainham and the M2 motorway in Kent. The site consists mostly of dry grassland steppes, with some broad-leaved deciduous woodland and small areas of scrub and heath. The site hosts the priority habitat type "orchid rich sites" and consists of CG3 *Bromus erectus* grassland. It contains an important assemblage of rare and scarce plant species, including Early Spider-Orchid *Ophrys sphegodes*, Burnt Orchid *Orchis ustulata* and Man Orchid *Aceras anthropophorum*.

11.4.14 The Outer Thames Estuary SPA lies along the east coast of England in the southern North Sea and extends northward from the Thames Estuary to the sea area off Great Yarmouth, Norfolk. The site crosses the 12-nautical mile boundary and therefore lies partly in terrestrial and partly in offshore waters. It is home to the largest aggregation of wintering Red-Throated Diver *Gavia stellate* in the UK. The recent extension to the SPA boundary will afford protection for Little Tern *Sternula albifrons* and Common Tern *Sterna hirundo* foraging areas, enhancing the protection already afforded to their feeding and nesting areas in the adjacent coastal SPAs.

11.4.15 The Swale Estuary MCZ was designated in January 2016. The area designated is an inshore site and covers the Swale Estuary from the point at which it meets the Medway Estuary, south of the Isle of Sheppey, and extends towards the end of The Street at Whitstable. The site is considered to be highly diverse and is important as a spawning and nursing ground for various fish species. The main channel of the Swale Estuary contains several important seabed habitats, such as sand and sediments. The coarse sediment is home to fauna such as bristleworms, sand mason worms, small shrimp-like animals, burrowing anemones, and cockles. Broad scale habitat features of the Swale Estuary MCZ include intertidal habitats (i.e. estuarine rocky habitats, low energy intertidal rock, intertidal mixed sediment, intertidal coarse sediment and intertidal sand and muddy sand) and subtidal habitats (i.e. subtidal coarse, mixed, sand and muddy sediments).

11.4.16 Elmley NNR is home to large numbers of wintering wildfowl and breeding waders. This wide expanse of grazing marsh, divided by ditches and frequent shallow surface flooding, is at or below sea level.

11.4.17 There is one non-statutory designated site within 2 km of the application boundary, Milton Creek Local Wildlife Site (LWS). This site includes a mosaic of habitats along the western edge of Milton Creek, such as saltmarsh, with Sea Purslane *Halimione portulacoides* and Common Saltmarsh-grass *Puccinellia maritima* co-dominant, although other species such as Sea Wormwood *Artemisia maritima*, Sea Lavender *Limonium vulgare*, Sea Aster *Aster tripolium* and Scurvygrass *Cochlearia anglica* are quite common. A small amount of Thrift *Armeria maritima* also occurs. Golden Samphire *Inula crithmoides* is present along the banks all the way to Crown Quay.

11.4.18 The site is also locally important for a number of bird species, with several Red Book Data species present; Redshank *Tringa totanus* is the dominant winter wader. Other species of note within the LWS include Grass Snake *Natrix natrix*,

Slow-worm *Anguis fragilis* and Marsh Frog *Rana ridibunda*, as well as several invertebrate species, such as the Holly Blue *Celastrina argiolus*, Common Blue *Polyommatus icarus* and Wall Brown *Lasiommata megera* butterflies.

Protected species

11.4.19 See Figure 11.2 for the locations of records of protected species.

Amphibians

11.4.20 There are 79 records of protected or notable amphibian species occurring within 2 km of the DCO boundary. Largely, these are associated with Milton Creek LWS.

Birds

11.4.21 There are 207 records of protected or notable bird species occurring within 2 km of the assessment boundary site over the last ten years. The majority of these are associated with designated sites such as or The Swale Ramsar, SPA and SSSI, or Milton Creek LWS.

Flora

11.4.22 There are 4 records of protected and/or notable flora species occurring within 2 km. Similar to other protected species, these are associated with designated sites, such as The Swale SPA, Ramsar and SSSI, as well as Milton Creek LWS.

Invertebrates

11.4.23 There are no records of protected and/or notable invertebrate species occurring within 2 km over the last ten years.

Mammals

11.4.24 There are 251 records of protected bat species occurring within 5 km of the assessment boundary; including several maternity roosts. The majority of these are located south of the application boundary, associated with the towns of Murston and Sittingbourne; there are also a number of records associated with the more rural areas surrounding the towns.

11.4.25 There are 1,534 records of water vole *Arvicola amphibius* within recorded within 2 km of the application site over the last ten years. These are all associated with the series of ditches within the wider area that form part of the grazing marsh within The Swale SPA, Ramsar and SSSI.

11.4.26 Other records of protected and/or notable mammals include European hedgehog *Erinaceus europaeus*, brown hare *Lepus europaeus* and a number of species of shrew.

Reptiles

11.4.27 There are three records of protected and/or notable reptile species occurring within 2 km over the last ten years. These are associated with Milton Creek LWS and The Swale SPA, Ramsar and SSSI.

Phase 1 Habitat Surveys

11.4.28 The majority of the DCO boundary was surveyed in 2009 to support the ES for the application relating to K3 as consented. Full details can be found in Appendix 11.3 and Figure 11.3, and updated, as necessary in 2018. Briefly, the following habitats were present:

Scrub

11.4.29 Areas of dense scrub containing frequent Bramble *Rubus fruticosus* agg, Hawthorn *Crataegus monogyna* and Dog Rose Rosa canina agg. were present across the Site.

11.4.30 On the western edge of the K3 Site was a small area of dense scrub with occasional Hawthorn, and single specimens of Hazel *Corylus avellana*, Sycamore *Acer pseudoplatanus* and a large Leylandii *Cupressus x leylandii*. A small stand of Poplar *Populus* species was also present to the south of this area.

11.4.31 In the south of the K3 Site was an area which contained a mosaic of dense scrub and unimproved neutral grassland. Abundant species included Hawthorn, Oxeye Daisy *Leucanthemum vulgare*, False Oat-grass *Arrhenatherum elatius*, Cocksfoot *Dactylis glomerata*, Creeping Bent *Agrostis stolonifera* and Common Couch *Elytrigia repens*. Frequent species included Common Bird's-foot-trefoil *Lotus corniculatus* and Creeping Cinquefoil *Potentilla reptans*.

11.4.32 Areas of scattered scrub were present within the northern half of the K3 Site consisting of frequent Bramble, Hawthorn and Silver Birch *Betulus pendula*. The scattered scrub to the north of the Site also had occasional Gorse *Ulex europaeus*.

Grassland

11.4.33 Areas of unimproved neutral grassland were present across the Site. G1 was relatively species-rich. Abundant species included Kidney Vetch *Anthyllis vulneraria*, Common Restharrow *Ononis repens*, False Oat-grass, Cock's-foot, Creeping Bent and Common Couch. Frequent species included Common Bird's-foot-trefoil and Creeping Cinquefoil. Occasional species included the following: Oxeye Daisy and Ribwort Plantain *Plantago lanceolata*.

11.4.34 G2 was relatively short and more species-rich than G1 and G3. Abundant species included Common Bird's-foot-trefoil, Creeping Bent, frequent Cock's-foot and occasional Common Ragwort *Senecio jacobaea*, Grass Vetchling *Lathyrus nissolia*, Wild Carrot *Daucus carota carota*, Dove's-foot Crane's-bill *Geranium molle*, Common Toadflax *Linaria vulgaris* and Yarrow *Achillea millefolium*.

11.4.35 Areas G3 contained abundant False Oat-grass, Cocksfoot, Creeping Bent, Common Couch. Frequent species included Common Bird's-foot-trefoil and Creeping Cinquefoil Occasional species included the following: Oxeye Daisy, and Ribwort Plantain.

Tall herb

11.4.36 Areas of tall ruderal vegetation were present across the Site with a large area present to the east of the Site. These areas contained abundant Greek Dock *Rumex cristatus*, White Mignonette *Reseda alba*, Bristly Oxtongue *Picris echioides,*

Hawkweed Oxtongue *Picris hieracioides* and Hedge Mustard *Sisymbrium officinale*. Frequent species included Yorkshire-fog, Creeping Bent, Oxeye Daisy and Canadian Fleabane *Conyza canadensis*.

Swamp

11.4.37 To the north of the Site was a large expanse (>3 ha) of swamp habitat, dominated by Common Reed with scattered scrub including Elder *Sambucus nigra* and Hawthorn.

11.4.38 The area south of the reedbed was dominated by bare ground that has recently been manually built up to level parts of the Site. This bare ground consists of a soil and stone aggregate.

11.4.39 A drainage ditch which runs approximately north-south on the western edge of the WKN Laydown Area (Works Area 6). This was heavily overgrown with Common Reed, Hawthorn and Bramble and was only wet in small patches.

11.4.40 A further ditch was located to the south of Works Area 5 which was similarly overgrown with Common Reed.

Waste tips

11.4.41 Spoil piles of soil and building material dominated the centre of the Site. These areas contained frequent Long-headed Poppy *Papaver dubium*, Oxford Ragwort *Senico squalidus*, Common Field Speedwell *Veronica persica* and Opium Poppy *Papaver somniferum.*

Cultivated/disturbed land

11.4.42 Areas of ephemeral/ short perennial vegetation were present around the area of spoil heaps. These areas were dominated by bare ground with frequent Hawkweed Oxtongue, Bristly Oxtongue, Perennial Ryegrass *Lolium perenne*, Annual Meadow-grass *Poa annua*, Colt's-foot *Tussilago farfara*, Spear Thistle *Cirsium vulgare*. Long-headed Poppy and Oxford Ragwort. Cornflower *Centaurea cyanus* (Target note 1, Figure 9.5) and Annual Beard-grass Polypogon monspeliensis. (Target note 2, Figure 9.5) were also recorded. The latter two species are a UKBAP and nationally scarce species respectively.

Intertidal areas

11.4.43 Full details of the intertidal habitats around the outfall (Works Areas 7 and 1E) can be found in Appendix 11.7. Briefly, these included saltmarsh, intertidal mudflats and various course sediments.

Further surveys - 2009

11.4.44 Following the Phase 1 Habitat Survey of the DCO boundary in 2009, several Phase 2 surveys were undertaken including: invertebrate surveys, reptile surveys, breeding bird surveys, and a water vole survey. Full details can be found in Appendix 11.3.

11.4.45 These identified the following receptors as present either on site or directly adjacent to it:

- a population of reptiles (Common Lizard, Slow-Worm & Grass Snake);
- the nationally-scarce Annual Beard-grass;
- populations of the Schedule 1 birds Cetti's Warbler, Bearded Tit and Marsh Harrier; and
- Open Mosaic Habitat of importance for invertebrates.

Further surveys - 2018

11.4.46 The following surveys were undertaken to ensure a complete baseline of ecological information was available with respect to areas within the DCO boundary that had no relevant survey data from 2009. Principally, this related to the proposed WKN laydown area (Work No. 6) and construction access road (Work No. 5).

Bird surveys

11.4.47 Following the Phase 1 Habitat Survey, suitable habitat was identified to support species of breeding birds, such as Cetti's Warbler and Bearded Tit; therefore, follow up breeding bird surveys were undertaken in 2018, updating those undertaken in 2009 (both reported in Appendix 11.1).

Reptile Survey

11.4.48 The habitats on site were identified as being suitable to support reptile populations, and so during 2018 a targeted reptile survey was carried out. This identified a low population of both common lizards and slow worms was observed during reptile surveys of the laydown area, with a peak count of five common lizards and six slow worms found on any one survey.

Off-site (Zone of influence) Survey Work

11.4.49 Extensive survey work of the off-site intertidal habitat surrounding the DCO boundary, including that at the closest point to the site 100 m to the south east, has been undertaken over the last 10 years to inform the K3 project (in 2009 and 2016) – Appendix 11.1 and 11.3. These surveys have highlighted that the stretch of The Swale adjacent to the wider Kemsley Paper Mill site is used extensively by intertidal species, including citation species for both the SPA and Ramsar, over winter and at both low and high tide, including Black-tailed Godwit, Curlew, Greenshank, Grey Plover, Red Shank and Teal. Updated surveys have been undertaken in winter of 2018-2019 and are also reported in Appendix 11.1.

11.4.50 A reedbed 50m of the north of the WKN Site has been found to support breeding Marsh Harrier every year that surveys have been undertaken (Appendix 11.1). Marsh Harrier is one of the species listed within the breeding bird assemblage for which The Swale is designed as an SPA. Additionally, both Cetti's Warbler and Bearded Tit, both listed on Schedule 1 of the Wildlife and Countryside Act (1981),

as amended, have been recorded in scrub habitat surrounding the reedbed. Surveys undertaken during 2018 found similar results.

Sensitive Receptors

11.4.51 The sensitive receptors listed in Table 11.4 below have the potential to be affected by effects arising from the DCO development. The assessment in this Chapter has considered the effects listed in the table upon the identified sensitive receptors.

Receptor	Importance/sensitivity/vulnerability to change
The Swale SPA/Ramsar	Very High
The Medway Estuary and Marshes SPA/Ramsar	Very High
Other international designated sites in the surrounding 10 km	Very High
The Swale SSSI	High
The Medway Estuary and Marshes SSSI	High
The Swale MCZ	High
Milton Creek LWS	Medium
Breeding Schedule 1 birds (non-SPA), inc. Cetti's Warbler	Low
Reptile population	Low
Annual beard-grass	Low

Table 11.4: Sensitive ecology receptors

11.5 Future baseline

11.5.1 In the absence of the WKN Proposed Development & K3 Proposed Development, K3 would continue to operate under the previously consented scheme This includes all of the mitigation and habitat creation associated with that consent.

11.5.2 The DCO Boundary would otherwise be maintained as the habitats present predevelopment, as modified by natural succession/climate change. As such, it would be anticipated that most of the grassland/swamp habitat would eventually succeed to dense scrub habitats.

11.6 K3 Proposed Development Predicted Effects - Construction

11.6.1 The construction impacts of K3 as consented were assessed in detail as part of the 2010 Environmental Statement (Document 3.2). K3 as consented is at an advanced stage of construction and due to be fully operational by the end of 2019. All planning conditions of relevance to ecology have been discharged. No further external construction work is required by way of consequence of the practical effect of the K3 Proposed Development. The assessment undertaken as part of the 2010 ES therefore remains a robust assessment for the consideration of the construction of the K3 Proposed. For reference a brief summary is provided below.

11.6.2 Receptors which were assessed as part of this ES included:

- Swale Ramsar / SPA;

- Medway Estuary Marshes Ramsar, SPA;
- Swale SSSI;
- Medway Estuary and Marshes SSSI;
- Elmley Island NNR;
- Milton Creek LWS
- Brownfield habitat;
- Annual beard-grass;
- Invertebrate populations;
- Reptiles;
- Breeding birds;
- Non-breeding intertidal waterbirds; and
- Harvest Mouse

11.6.3 The previous ES concluded that there would be no significant effects on ecology arising from the construction phase of the development, subject to the mitigation outlined. This included best practice construction methodologies, as outlined in the EMMP (Appendix 11.4), along with restrictions on the timing of piling, a reptile translocation, and the creation of new habitat for reptiles, harvest mouse, annual beard-grass, invertebrates and breeding birds.

11.6.4 Additionally, while anecdotal evidence suggests that the effect of disturbing activity on breeding Marsh Harrier during the construction phase is unlikely to be significant, some doubt remained during the original 2009 assessment. The S106 Agreement for the consented generating station (referred to previously as a 'Sustainable Energy Plant' or 'SEP') therefore included the requirement to create a new reedbed at Hartey Fen on the Isle of Sheppey as part of the RSPB's habitat creation scheme to return farmland to grazing marsh and associated habitats (including reedbed). This was intended to provide alternative breeding habitat, should the Marsh Harrier choose to abandon the Kemsley reedbed, particularly during construction. Such a reedbed has been created and signed off by the RSPB.

The effect of the K3 Proposed Development - Operation

11.6.5 Operational activities may potentially cause:

- degradation and loss of habitats e.g. from pollution and lack of or inappropriate management;
- degradation to and loss of habitats that support species of conservation importance e.g. from pollution and lack of or inappropriate management;

- disturbance to wildlife e.g. from noise or light pollution, human activity and vehicular movement; and

- changes in air quality;

11.6.6 Of the above, the majority of the potential effects of the first two relate to the built form/final layout/management of the K3 Proposed Development.

11.6.7 The effects of K3 as consented were assessed in detail as part of the 2010 Environmental Statement (Document 3.2). K3 as consented is at an advanced stage of construction and due to be fully operational by the end of 2019. The practical effect of the K3 Proposed Development of the K3 Proposed Development will not result in any practical changes in this regard. Therefore, the effect of these impacts remains as assessed in the original ES and, as such, are not significant.

Noise

11.6.8 The HGV movements brining waste to K3 Proposed Development (416 HGV movements per day – as per Chapter 4) may generate noise levels sufficient to cause disturbance to birds using the nearby designated sites. The potential for such disturbance is considered very limited, however.

11.6.9 The closest point of the highway network used by the HGVs to the designated sites is at the roundabout at the junction of Barge Way with the North Gate of the Kemsley Paper Mill. This is some 400 m from intertidal habitats of The Swale SPA/Ramsar/SSSI and circa 70 m from the grazing marsh habitats of that site. Given these distances, it is very unlikely that the increases in HGV numbers compared to the baseline in this location would generate noise sufficient to result in disturbance of birds.

11.6.10 The HGV movements will access the K3 Site via the existing access road. This will take them within circa 100m of the reedbed to the north of the K3 Proposed Development that supports breeding Marsh Harrier. The potential for disturbance effects on the breeding Marsh Harrier in this area is considered low since the birds using the reedbed are already habituated to the movement of HGVs along the roads that surround the reedbed with no apparent effect (as demonstrated by their continued presence on site between 2009 and 2018). Further to this, modelling of HGV construction noise shows that the noise associated with this would be around 50 dBL_{Amax} (Figure 11.5a) across the areas of dense scrub surrounding the reedbed. This is below the impact threshold that Natural England suggest should be used for further investigation with respect to noise disturbance of birds.

Air quality

11.6.11 Appendix 5.4 of Chapter 5 (Air Quality) provides an analysis of the combined impacts of emissions to air of the K3 Proposed Development with the WKN Proposed Development, along with an assessment of cumulative impacts from other proposed / committed developments, on the features of interest of the surrounding designated sites along with their supporting habitats.

11.6.12 The operational effects of air quality arising from traffic and emissions to air (Appendix 5.4 of Chapter 5) have been modelled, at a selection of discrete

receptor points at the closest point of the designated sites adjacent to roads affected by the WKN Proposed Development and K3 Proposed Development.

11.6.13 Cumulative traffic data for the WKN Proposed Development and K3 Proposed Development in the opening year of WKN, 2024 was modelled. The PC from the WKN Proposed Development and the K3 Proposed Development stack emissions at each of the sensitive receptors was added to the road contribution to give a 'WKN + K3' PC that considers both stack and traffic emissions.

11.6.14 Only the Swale SPA/SSSI/Ramsar and the Medway Estuary and Marshes SPA/Ramsar are within 200 m of a road affected by the WKN Proposed Development and K3 Proposed Development. The A249 passes through the Medway Estuary and Marshes SPA/Ramsar so receptors were selected at the roadside.

11.6.15 For NO_x, the cumulative PC as a percentage of the CL is less than 1% for the Medway Estuary and Marshes SPA/Ramsar. At both the Swale SPA/SSSI/Ramsar and the Medway Estuary and Marshes SPA/Ramsar, the PEC is less than the CL. On that basis, the cumulative effects are considered insignificant.

11.6.16 For nitrogen deposition the cumulative PC as a percentage of the CL is less than 1% for both the Medway Estuary and Marshes SPA/Ramsar and the Swale SPA/SSSI/Ramsar and the cumulative impacts are considered insignificant.

11.6.17 The cumulative PECs presented in Appendix 5.4 can be considered highly conservative as the PCs from the other developments are the maximum impacts across a grid and are unlikely to occur at the same location as the maximum road contribution. On this basis, all impacts as a results of traffic emissions, and the stack emissions with traffic cumulatively are negligible, and as such, are not significant.

11.6.18 Based on current Environment Agency guidelines [Ref 11.13] and the Institute of Air Quality Management Position Statement [Ref 11.14], for all other pollutants (NO_x, NH_3, SO_2, nutrient nitrogen deposition and acid deposition), either the Predicted Environmental Concentration (PEC) did not exceed the Environmental Quality Standard (EQS) or the Process Contribution (PC) was <1% of the EQS for the majority of interest features and supporting habitats of the designated sites.

11.6.19 The only interest features where this was not the case was Eurasian reed warbler and reed bunting for The Swale SPA with respect to nutrient nitrogen deposition where the PC was greater than 1% of the minimum critical load and the relevant minimum critical load is already exceeded. Both species are associated with reedbed habitats within which they breed across The Swale. Neither species has been recorded breeding within the DCO boundary nor within the reedbed to the north of the WKN Site. However, they may be present in the wider area, Coldharbour Fleet to the north west, for example.

11.6.20 Notwithstanding this, reedbed habitats in north Kent are unlikely to be very sensitive to nutrient nitrogen deposition. The APIS website from which the information with respect to critical loads is derived incorporates reedbed with other wetland habitats such as marsh and fens. It notes that the minimum critical load for these habitats listed on APIS and used in Appendix 5.4 (15 $kgN.ha^{-1}.yr^{-1}$) represents more closely upland habitats that will be naturally more nutrient poor

and therefore more susceptible to species composition change due to atmospheric nitrogen input. Reedbeds are, by their nature, monospecific, dominated by common reed. As such, their susceptibility to competitive exclusion by other graminoid species is considered very low. The upper end of the critical load range is therefore considered more appropriate for these habitats, set within grazing marsh which are higher nutrient systems due to the underlying nutrient status of the soils within the flood plain on which they form. Using the upper critical load for this habitat of 30 $kgN.ha^{-1}.yr^{-1}$ is therefore more appropriate meaning that the PC becomes ≤1% of this critical load and, as such, is not significant.

11.6.21 Therefore, all impacts as a result of the operation of the K3 Proposed Development are negligible and, as such, the effects are not significant.

11.7 K3 Proposed Development Decommissioning

11.7.1 Although the exact nature of how decommissioning/demolition of the K3 Proposed Development is not currently known, impacts from such activities would be similar to those generated during construction. This would include potential impacts arising from dust, noise, and drainage; all of which would be addressed via the production of a Decommissioning and Demolition Environmental Management Plan, to be produced prior to such work secured via a requirement in the DCO.

The Practical Effect of the K3 Proposed Development

11.7.2 The ecological conditions in relation to construction of the K3 as consented were assessed as part of the EIA completed for the original planning application for the facility (a summary is provided above at 11.6.2).

11.7.3 All works pursuant to the construction of K3 as consented and planning conditions in relation to ecological matters have been completed and discharged.

11.7.4 No further external construction work is required by way of consequence of the practical effect of the K3 Proposed Development.

11.7.5 The practical effect of the consent for the K3 Proposed Development sought would not result in any additional external physical changes to K3 as consented and the layout and appearance of the facility will remain as per its consented design. No ecological impacts during operation above those already considered during the permitting process from activity, recreational, changes to habitat management, light or invasive species are expected.

11.7.6 The DCO being sought would allow K3 as consented to operate to an upgraded power generation level of 75MW (an additional 25.1MW) and to process 657,000 tonnes of waste per annum (an additional 107,000 tonnes) above and beyond that permitted under its existing planning permission. The practical effect therefore has the potential to give rise to changes in air quality through emissions to air from the stack and changes in vehicle-related emissions associated with additional traffic movements.

11.7.7 As requested in the Scoping Opinion issued by PINS, consideration is also given to the potential for increased traffic to result in noise disturbance of birds using the surrounding designated sites.

Air Quality

11.7.8 Appendix 5.4 of Chapter 5 (Air Quality) provides an analysis of the combined impacts of emissions to air of the K3 Proposed Development with the WKN Proposed Development, along with an assessment of cumulative impacts from other proposed / committed developments, on the features of interest of the surrounding designated sites along with their supporting habitats.

11.7.9 The operational effects of air quality arising from traffic (Appendix 5.4 of Chapter 5) have been modelled , at a selection of discrete receptor points at the closest point of the designated sites adjacent to roads affected by the WKN Proposed Development and K3 Proposed Development.

11.7.10 Cumulative traffic data for the WKN Proposed Development and K3 Proposed Development in the opening year of WKN, 2024 was modelled. The PC from the WKN Proposed Development and the increase in K3 stack emissions at each of the sensitive receptors was added to the road contribution to give a 'WKN + Increase in K3' PC that considers both stack and traffic emissions.

11.7.11 Only the Swale SPA/SSSI/Ramsar and the Medway Estuary and Marshes SPA/Ramsar are within 200 m of a road affected by the WKN Proposed Development and K3 Proposed Development. The A249 passes through the Medway Estuary and Marshes SPA/Ramsar so receptors were selected at the roadside.

11.7.12 For NO_x, the cumulative PC as a percentage of the CL is less than 1% for the Medway Estuary and Marshes SPA/Ramsar. At both the Swale SPA/SSSI/Ramsar and the Medway Estuary and Marshes SPA/Ramsar, the PEC is less than the CL. On that basis, the cumulative effects are considered insignificant.

11.7.13 For nitrogen deposition the cumulative PC as a percentage of the CL is less than 1% for both the Medway Estuary and Marshes SPA/Ramsar and the Swale SPA/SSSI/Ramsar and the cumulative impacts are considered insignificant.

11.7.14 The cumulative PECs presented in Appendix 5.4 can be considered highly conservative as the PCs from the other developments are the maximum impacts across a grid and are unlikely to occur at the same location as the maximum road contribution. On this basis, all impacts as a results of traffic emissions, and the stack emissions with traffic cumulatively are negligible, and as such, are not significant.

11.7.15 Based on current Environment Agency guidelines [Ref 11.13] and the Institute of Air Quality Management Position Statement [Ref 11.14], for all other pollutants (NO_x, NH_3, SO_2, nutrient nitrogen deposition and acid deposition), either the Predicted Environmental Concentration (PEC) did not exceed the Environmental Quality Standard (EQS) or the Process Contribution (PC) was <1% of the EQS for the majority of interest features and supporting habitats of the designated sites.

11.7.16 The only interest features where this was not the case was Eurasian reed warbler and reed bunting for The Swale SPA with respect to nutrient nitrogen deposition where the PC was greater than 1% of the minimum critical load and the relevant minimum critical load is already exceeded. Both species are associated with reedbed habitats within which they breed across The Swale. Neither species has

been recorded breeding within the DCO boundary nor within the reedbed to the north of the WKN Site. However, they may be present in the wider area, Coldharbour Fleet to the north west, for example.

11.7.17 Notwithstanding this, reedbed habitats in north Kent are unlikely to be very sensitive to nutrient nitrogen deposition. The APIS website from which the information with respect to critical loads is derived incorporates reedbed with other wetland habitats such as marsh and fens. It notes that the minimum critical load for these habitats listed on APIS and used in Appendix 5.4 (15 $kgN.ha^{-1}.yr^{-1}$) represents more closely upland habitats that will be naturally more nutrient poor and therefore more susceptible to species composition change due to atmospheric nitrogen input. Reedbeds are, by their nature, monospecific, dominated by common reed. As such, their susceptibility to competitive exclusion by other graminoid species is considered very low. The upper end of the critical load range is therefore considered more appropriate for these habitats, set within grazing marsh which are higher nutrient systems due to the underlying nutrient status of the soils within the flood plain on which they form. Using the upper critical load for this habitat of 30 $kgN.ha^{-1}.yr^{-1}$ is therefore more appropriate meaning that the PC becomes $\leq$1% of this critical load and, as such, is not significant.

11.7.18 Therefore, all impacts as a result of the operation of the K3 Proposed Development are negligible and, as such, the practical effects of the K3 Proposed Development are not significant.

Noise

11.7.19 Although the operational noise will not change as a result of the K3 Proposed Development, the additional HGV movements (68 HGV movements per day) above K3 as consented to may generate noise levels sufficient to cause disturbance to birds using the nearby designated sites. The potential for such disturbance is considered very limited, however.

11.7.20 The closest point of the highway network used by the HGVs to the designated sites is at the roundabout at the junction of Barge Way with the North Gate of the Kemsley Paper Mill. This is some 400 m from intertidal habitats of The Swale SPA/Ramsar/SSSI and circa 70 m from the grazing marsh habitats of that site. Given these distances, it is very unlikely that the small increases in HGV numbers compared to the baseline in this location would generate noise sufficient to result in disturbance of birds.

11.7.21 The additional HGV movements above K3 as consented will access the K3 Site via the existing access road. This will take them within circa 100m of the reedbed to the north of the K3 Proposed Development that supports breeding Marsh Harrier. The potential for disturbance effects on the breeding Marsh Harrier in this area is considered low since the birds using the reedbed are already habituated to the movement of HGVs along the roads that surround the reedbed with no apparent effect (as demonstrated by their continued presence on site). Further to this, modelling of HGV construction noise shows that the noise associated with this would be around 50 - 55 dBLAmax (Figure 11.5a) across the areas of dense scrub surrounding the reedbed. This is below the impact threshold that Natural England suggest should be used for further investigation with respect to noise disturbance of birds.

Decommissioning

11.7.22 Although the exact nature of how decommissioning/demolition of the K3 Proposed Development is not currently known, impacts from such activities would be similar to those generated during construction. This would include potential impacts arising from dust, noise, and drainage; all of which would be addressed via the production of a Decommissioning and Demolition Environmental Management Plan, to be produced prior to such work secured via a requirement in the DCO.

11.7.23 This remains applicable to the K3 Proposed Development and its practical effect.

11.8 Summary

11.8.1 Table 11.5 summarises the effects of the K3 Proposed Development.

Effect Identified	Receptor Sensitivity	Impact Magnitude	Nature	Duration	Degree of Effect
Construction Effects					
As assessed in the 2010 ES – all effects Not Significant once mitigation taken into account					
Completed Development Effects					
The Swale Ramsar and SPA - Air Quality	Very High	Negligible	Slight	Long-term	**Not significant**
Medway Estuary and Marshes Ramsar and SPA - Air Quality	Very High	Negligible	Slight	Long-term	**Not significant**
Thames Estuary and Marshes SPA - Air Quality	Very High	Negligible	Slight	Long-term	**Not significant**
Queensdown Warren SAC - Air Quality	Very High	Negligible	Slight	Long-term	**Not significant**
The Swale MCZ - Air Quality	High	Negligible	Slight	Long-term	**Not significant**
The Swale SSSI - Air Quality	High	Negligible	Slight	Long-term	**Not significant**
Medway Estuary SSSI - Air Quality	High	Negligible	Slight	Long-term	**Not significant**
Elmley Island NNR - Air Quality	High	Negligible	Slight	Long-term	**Not significant**
Milton Creek LWS - Air Quality	Medium	Negligible	Negligible	Long-term	**Not significant**
The Swale Ramsar and SPA – Noise from traffic movement	Very High	No change	No change	Long-term	**Not significant**

The Swale SSSI – Noise from traffic movement	High	No change	No change	Long-term	**Not significant**

Table 11.5: Summary of Effects

11.9 WKN Proposed Development Predicted Effects

11.9.1 This section identifies and assesses the potential effects that are predicted to occur during construction and on completion of the WKN Proposed Development. The baseline against which the WKN Proposed Development is assessed is K3 as consented. K3 as consented is due to become fully operational by the end of 2019.

11.9.2 This assessment has assumed that all standard mitigation would be included within both the construction and operational phases of the development, which will comply with all good practise guidelines. Detailed principles will follow those outlined in the Ecology Mitigation and Enhancement Strategy (Appendix 11.4), the Construction and Environmental Management Plan (CEMP) (Appendix 2.1), and the Lighting Strategy, (Appendix 11.8).

11.9.3 Construction activities are detailed in Chapter 2. In terms of ecological impacts, the development may potentially cause:

- Permanent loss of natural or semi-natural habitats;
- Temporary loss of natural or semi-natural habitats;
- Permanent loss of habitat that supports species of conservation importance;
- Temporary loss of habitat that supports species of conservation importance;
- Temporary disturbance to wildlife, e.g. from noise, vibration or light pollution, human activity and vehicular movements, and overshadowing of bird habitats;
- Soil compaction, resulting in changes to flora and fauna;
- Discharge of site drainage water to the marine environment during the operational phase;
- Accidental release of pollution from the proposed development site; and
- Spread of invasive species.

WKN Proposed Development Construction Effects

The Swale SPA and Ramsar (Very High Value)

11.9.4 The impact of the construction phase of the development on The Swale SPA and Ramsar is described in detail below.

11.9.5 The construction of the proposed second outfall for the WKN Proposed Development into The Swale (Work No.7) will follow the same methodology/timing restrictions set out in the approved Marine Licence for the first outfall constructed to serve K3. This approach is codified in the amended Marine Licence granted by the MMO in May 2019 (licence ref. L/2017/00482/2 – Appendix 11.7). The application for the amended Marine Licence included an ecological appraisal of the potential effects on the marine component of the SPA/Ramsar as well as the Marine Conservation Zone along with a Water Framework Directive (WFD) assessment (Appendix 11.7).

11.9.6 This concluded that, assuming all the methodological/timing restrictions set out in the Marine Licence were adhered to, there would be no impacts on The Swale from the construction of the outfall. As such, all impacts due to the outfall are not significant and are not discussed further in this assessment.

Habitat Loss

11.9.7 The development will cause no direct impact to The Swale SPA and Ramsar via habitat loss, given no part of either designated site falls within the site boundary.

Drainage

11.9.8 As described in Chapter 10 Water, once construction of the WKN Proposed Development commences, the hardstanding areas will drain eastwards into the storage pond that will be the first element of the scheme constructed. It will ensure that settling pond capabilities are available from the start of the works, and to provide tidal inundation protection to the construction site. Works on site will follow the best practice guidelines with respect to the management of surface water. Temporary foul drainage to serve the contractors welfare facilities was put in place at the start of works on site and linked to the existing Kemsley Paper Mill foul system. The following activities/items will be located more than 20 m from the site boundary perimeter: refuelling and maintenance of machines, oil storage tanks, chemical or fuel storage and on-site concrete batching plants (if utilised). A strict waste management system will be incorporated to prevent the disposal of construction or domestic rubbish entering the adjacent reedbed areas used by breeding marsh harrier.

11.9.9 This affords protection to the Swale from any spills or other pollutants. Whilst changes to the drainage network are proposed, mechanisms will be implemented to avoid any pollution incidents in accordance with legislative requirements and Environment Agency guidance.

11.9.10 Full implementation of the above would ensure no adverse impacts on the SPA (including the adjacent reedbed) in relation to drainage and surface hydrology.

11.9.11 It is considered likely that the magnitude of the impacts of changes to drainage during construction on a feature of very high value would be negligible. This would result in a slight effect and is therefore not significant.

Light Spill

11.9.12 There is potential for light spill from the construction site to impact the birds using the SPA/Ramsar. The light scheme will follow best practice to minimise light impacts. The construction lighting design includes:

- Having no direct lighting of any designated areas;
- Position lighting to screen designated areas by flood defences;
- Making use of relatively low directional lighting that limits spillage, glare or additional sky glow; and
- Locating construction compounds to ensure lighting effects are prevented for the surrounding designated sites.

11.9.1 The lighting from the WKN Proposed Development during construction will be similar to that which currently exists on the adjacent K3 and the surrounding Kemsley Paper Mill. All lighting will be installed in accordance with best practice and will be directed inward, toward the development. Details of the lighting during construction will be secured within the CEMP.

11.9.2 It is considered likely that the magnitude of the impacts of changes to lighting during construction on a feature of very high value would be negligible. This would result in a slight effect and is therefore not significant.

Disturbance from people and plant movements

11.9.3 The movement of people and plant during the construction phase of the development may be visible to a small proportion of the SPA cited bird species using the intertidal areas of the SPA/Ramsar. It is considered there is a limited potential for disturbance of birds using the intertidal areas caused by people when account is taken of the fact that:

- The SPA/Ramsar cited bird species feeding on the adjacent intertidal area are already habituated to people using the Knauf Jetty (immediately to the north of the laydown area), industrial areas behind the seawall and public footpath along the seawall itself.
- The majority of SPA/Ramsar cited bird species on the intertidal area during all phases of the tide will be screened from people movement by the sea wall, buildings and topographical features and the concentrations occurring on the opposite bank of the River Swale are over 500 m from the proposed area of construction and separated by the river channel and seawall.

11.9.4 Therefore, it is not anticipated that SPA/Ramsar cited birds using the intertidal areas of The Swale will be disturbed by plant or people movement during the construction phase of the development.

11.9.5 Whilst Marsh Harrier have generally been considered susceptible to disturbance, especially during the breeding season, the increase in the population in North Kent has resulted in them using what would formerly have been regarded as unsuitable sites on the basis of the level of disturbance to which they are subjected. The reedbed immediately to the north, for example, is subject to regular disturbance from activity on the Knauf gypsum jetty immediately to the north of the reedbed.

11.9.6 This can involve up to 30 20-ton tipper lorry movements an hour with vehicles travelling at speed up the private road. No impact (in the form of flight from nest) of such lorry movement on the breeding pair of Marsh Harrier was observed during surveys in either 2009 or in 2016. Further, the reedbed has continued to be used by this species through the construction of both K3 and the DS Smith AD Plant, which is located directly to the north of the reedbed.

11.9.7 The effects of human disturbance on parental care by Marsh Harrier and the nutritional condition of nestlings have been studied at Dos Reinos Lake, Spain [Ref 11.18]. Whilst the effects of severe human disturbance were considered to limit Marsh Harrier parental care, male behaviour was considered only affected during food provisioning in the incubation stage. Overall, breeding success was unaffected between disturbed and undisturbed pairs, suggesting Marsh Harriers have developed coping mechanisms for increased disturbance. This would seem to apply at the Kemsley site where the nest is also close to considerable HGV movements within 50 m of the nest associated with the existing Kemsley Paper Mill.

11.9.8 Therefore, while anecdotal evidence suggests that the effect of disturbing activity on breeding Marsh Harrier during the construction phase is unlikely to be significant, some doubt remained during the original 2009 assessment.

11.9.9 The S106 Agreement for the original K3 application included the requirement to create a new reedbed at Hartey Fen on the Isle of Sheppey; as part of the RSPB's habitat creation scheme to return farmland to grazing marsh and associated habitats (including reedbed). This was intended to provide alternative breeding habitat, should the Marsh Harrier choose to abandon the Kemsley reedbed, particularly during construction of K3.

11.9.10 Such a reedbed has been created and signed off as complete by the RSPB. Recent discussions (October 2018) confirm that the reedbed is successfully developing, and that Marsh Harrier are using adjacent areas. Therefore, the overall expectation is that once the reedbed has developed further, Marsh Harrier will use it for nesting.

11.9.11 To further avoid any activity disturbance related to human activity during construction, a 2.4 m closed-board wooden fence has been erected along the northern site boundary (as part of the previous clearance works for the K3 laydown), following the Ecological Mitigation and Enhancement Strategy which was prepared for the site (Appendix 11.4). Such a fence will also be erected around the proposed laydown area.

11.9.12 Consequently, when account is taken of the impact-avoidance mechanisms already implemented, it is also concluded that disturbance of breeding Marsh Harrier in the form of plant (machinery) or people during the construction of the

WKN Proposed Development can be screened out as not likely to have a significant effect.

11.9.13 It is therefore considered likely that the magnitude of the impacts of disturbance during construction on a feature of very high value would be negligible. This would result is a slight effect and is therefore not significant.

Recreational disturbance

11.9.14 The potential for disturbance to SPA/Ramsar cited bird species from recreational use of the construction staff is considered low. Whilst there is an access route via the path at the southern end of the WKN Site, there is no current use of this access route by Kemsley Paper Mill staff. The operational nature and characteristics of the wider Kemsley Paper Mill Site mean access is restricted and measures are already in place to prevent incursion outside of defined areas. Therefore, it is not anticipated that any of the construction staff will access The Swale SPA/Ramsar.

11.9.15 There will be no impact from recreational disturbance from members of the public, as there is no public access via the site.

11.9.16 It is considered likely that the magnitude of the impacts of recreational disturbance during construction on a feature of very high value would be no change. This would result in no change and is therefore not significant.

Noise and vibration

11.9.17 Noise created during the construction phase from piling works, HGV movements and other construction activities has the potential to disturb birds wintering within the SPA/Ramsar, causing them to cease feeding or fly away from the area of influence. It is recognised that loud and 'percussive' noises have the greatest potential to cause disturbance and a threshold has been identified from the published scientific literature of 80dBL_{Amax} with a screening threshold around 55 dBL_{Amax}. The main intertidal areas of The Swale Ramsar/SPA used by wintering citation birds recorded by the foreshore monitoring are over 200 m from the construction area of the WKN Proposed Development, where significant noise events may occur.

11.9.18 Modelling of the noise generated by the loudest events during construction (impact piling) has been undertaken (see Chapter 7 – Noise & Vibration for details of the modelling), assuming that the nearest building to The Swale (the stores building) requires impact piling. The resulting noise contours have been plotted with the nearby designated sites shown (Figure 11.4); the highest noise that would be received by birds using the SPA/Ramsar has been modelled at 61.5 dBL_{Amax}, covering an area of some 9.6 ha within the 6,514-ha designated site, which equates to 0.147% of the designated site.

11.9.19 As set out in the Habitats Regulations Assessment Report (HRAR – Appendix 11.2), this area of intertidal habitat is used by citation and assemblage species of The Swale SPA and Ramsar.

11.9.20 Marsh harrier using the reedbed to the north of the proposal site are closer to potentially disturbing noises, the loudest of which is likely to be from impact piling.

11.9.21 Therefore, in order to avoid impacts to the birds using the intertidal area and marsh harrier, impact piling would be undertaken during the following periods:

- No impact piling between April and August, inclusive;
- No impact piling between the months January and February inclusive.
- Limited impact piling is permissible between the months of November and December provided that any impact piling activity does not accrue to more than a total of 10 days consecutively or otherwise.

11.9.22 Impact piling is permissible unrestricted outside of these time periods. All other methods of piling using non-impact methods can be used without restriction.

11.9.23 Details of this avoidance strategy with respect to piling noise will be set out within the CEMP.

11.9.24 In order to avoid disturbance impacts, the creation of the new outfall into The Swale (Works Area 7) will be undertaken following the same methodological and timing restrictions placed on the original Marine Licence (i.e. use of track mats and works restricted to outside wintering period).

11.9.25 Construction of the facility will also necessitate construction vehicles accessing the Site, a proportion of which will be HGVs. Construction traffic will consist of mix of light and heavy commercial vehicles to transport materials and equipment to and within the WKN Site. From Chapter 4 (Traffic and Transport) this will result in a maximum of 409 two-way movements, and up to 45 two way HGV movements.

11.9.26 These additional HGV movements will access the Site via the existing access road to the north. This will take them within circa 50 m of the reedbed to the north of the WKN Proposed Development that supports breeding Marsh Harrier. The potential for disturbance effects on the breeding Marsh Harrier in this area is considered low since the birds using the reedbed are already habituated to the movement of HGVs along the roads that surround the reedbed with no apparent effect (as demonstrated by their continued presence on site). Further to this, modelling of HGV reversing signals (as the most disturbing aspect of vehicle noise) shows that the noise associated with this would be around 50 - 55 dBL_{Amax} (Figure 11.5) across the areas of dense scrub surrounding the reedbed. This is below the impact threshold that Natural England suggest should be used for further investigation with respect to noise disturbance of birds.

11.9.27 Therefore, it is considered likely that the magnitude of the impacts of noise during construction on a feature of very high value would be negligible. This would result is a slight effect and is therefore not significant.

Overshadowing/line of sight

11.9.28 During the construction phase of the development there will be piling rigs and cranes on site. However, these will be set over 200 m back from the SPA/Ramsar.

Therefore, there is no potential for overshadowing/blocking of line of sight on the foreshore during construction and all such effects would be not significant.

Flight lines

11.9.29 Observations as part of the intertidal bird surveys and general observations on site during the breeding bird survey have shown that the main flight lines for SPA/Ramsar species in the vicinity of the WKN Site are offshore, with no waterbirds being noted to fly over the WKN Site in any of the surveys completed to date.

11.9.30 The WKN Site, at present, is used as the laydown area for K3, although before that was bare ground and ephemeral habitats. The surrounding area is already heavily industrialised to the south and north, and areas of conurbation exist to the west. Immediately to the south, K3 is currently under construction.

11.9.31 These factors, combined with the fact that the site is not enroute to any other nearby wetland areas, make it unlikely that water birds would pass through the the DCO boundary. As the proposal site lies entirely on the landward side of the sea wall and birds do not fly over the sea wall and onto/over the site in any significant numbers, it will not affect the flight lines of SPA/Ramsar birds using The Swale.

Therefore, the magnitude of the impact of changes to flight lines during construction on a feature of very high value, would be no change. This would result is a no effect and is therefore not significant.Air quality

11.9.32 The IAQM Guidance [Ref 11.4] on the assessment of dust from demolition and construction sets out 50 m as the distance from the site boundary and 50 m from the site traffic route(s), within which, there could be potential dust effects on ecological receptors. In this application, there are no ecological receptors within 50 m, and so, ecological effects have been scoped out. These distances have been set to be deliberately conservative.

11.9.33 Further to this, the number of HGV movements during the construction period will increase by a maximum of 90 per day (Appendix 4.1, Chapter 4 – Traffic and Transport). 90 is below the value of 200, which is the threshold of significant change [Ref 11.15]. The construction timelines of K3 and WKN will not overlap, and therefore, there is not going to be any cumulative impacts which would take the vehicle movements above 200.

11.9.34 As such, the magnitude of the impact of change upon this feature of very high value, would be no change. This would result in no effect, and is therefore, not significant.

Medway Estuary and Marshes Ramsar and SPA, Thames Estuary & Marshes Ramsar and SPA, Outer Thames Estuary SPA, Queendown Warren SAC (Very High Value)

11.9.35 The impact of the development during construction on these designated sites is described in Appendix 11.2: Information to Inform a Habitats Regulations Assessment.

11.9.36 Given the distance involved between these sites and the WKN Site no construction impacts are anticipated from air quality, lighting, construction noise, traffic, or recreation.

11.9.37 Therefore, the magnitude of the impacts of construction on a feature of very high value, would be no change. This would result in no change and is therefore not significant.

Swale Estuary MCZ (High Value)

11.9.38 The Swale MCZ is located (at its closest) 15 m east of the WKN Site, with the laydown area being at the closest point. However, it is a sub-tidal designated site and therefore there is no potential for disturbance of interest features.

11.9.39 All impacts due to changes to surface water will be the same as for The Swale SPA/Ramsar which coincide geographically with the MCZ, including with respect to the proposed second outfall (see Appendix 11.7).

11.9.40 It is considered likely that the magnitude of the impacts of the development on this feature of high value, would therefore be negligible. This would result in a slight effect which is not significant.

The Swale SSSI and Medway Estuary and Marshes SSSI, Elmley Island NNR (High Value)

11.9.41 Both SSSIs and the NNR cover the same geographical area as the corresponding SPA/Ramsar and are designated for similar interest features. As such, all construction impacts to these sites are the same as for the SPA/Ramsars described above.

11.9.42 As such, it is considered that the magnitude of the impacts of the development on this feature of high value, would be negligible. This would result in a slight effect which is not significant.

Milton Creek Local Wildlife Site (Medium Value)

11.9.43 Milton Creek Local Wildlife Site (LWS), located over 400 m south east of the WKN Site, contains a mosaic of habitats including saltmarsh, larger areas of rougher, unmanaged grassland, some unimproved pasture, and freshwater dykes with good aquatic and marginal flora. Although not designated as such, Milton Creek forms an extension to The Swale SPA. Therefore, given the distance between the WKN Site and Milton Creek, all impacts on the LWS during construction of WKN would be similar in nature to The Swale but of a lower magnitude. As such, all impacts to this receptor of medium value would be of negligible magnitude and significance and, as such, not significant.

Breeding Schedule 1 birds (non-SPA) (Low Value)

Habitat loss

11.9.44 Prior to its use as the laydown area for construction of K3, the WKN Site comprised a mosaic of bare ground, ephemeral habitats with rubble piles and small areas of grassland. These were not found to support breeding birds (Appendix 11.1 & 11.3). As such, the loss of these habitats as a result of the construction of WKN would have no impact on the breeding bird population in the area.

11.9.45 The construction of WKN Proposed Development would require the permanent loss of some areas of landscaping associated with the completed K3, that would include areas of dense scrub to be planted as mitigation for the loss of the breeding bird habitat present on the original K3 Site. Further loss of breeding bird habitat would occur during the clearance of vegetation in advance of the creation of the laydown area and parts of the construction access road albeit this would be temporary for the duration of construction.

11.9.46 Overall, therefore, there will be a net loss of breeding bird habitat (mainly dense scrub) for the duration of the construction phase of the WKN Proposed Development. The resulting impact would therefore be medium adverse magnitude on a receptor of low value, and therefore resulting in a slight adverse effect that is not significant.

Drainage

11.9.47 There is potential for the construction phase of the development to accidentally release pollution into the reedbed habitat to the north of the proposal site which supports the majority of the birds of conservation concern found during the survey work (see Appendix 11.1), especially from the proposed laydown area.

11.9.48 Contractor compliance with the Construction Environmental Management Plan (CEMP), similar to that produced to comply with conditions of the original K3 planning permission will ensure that works on site follow the best practice guidelines. Temporary foul drainage to serve the contractors welfare facilities was provided at the start of works on site to tie into the existing Kemsley Paper Mill drainage.

11.9.49 The following activities/items will be located more than 20m from the site perimeter: refuelling and maintenance of machines, oil storage tanks, chemical or fuel storage and on site concrete batching plants. A strict waste management system will be established to prevent the disposal of construction or domestic rubbish entering the adjacent marshland areas.

11.9.50 This affords protection to the reedbed area from any spills or other pollutants. Whilst changes to the drainage network are proposed, mechanisms will be implemented to avoid any pollution incidents in accordance with legislative requirements and Environment Agency guidance. The resulting effect would therefore be 'no change'.

Light spill

11.9.51 There is potential for light spill from the construction site to impact the breeding birds using the adjacent reedbed habitat. The light scheme for the construction phase will follow best practice to minimise light impacts as described above. Task specific lighting may also be required, however through careful positioning and

planning this should have minimal effect on the areas outside the site. Specific details of construction lighting will be secured through the CEMP.

11.9.52 Given the key reedbed area is at its closest point 50 m from the WKN Proposed Development boundary, the magnitude of the impact on this feature of low value is negligible. This would lead to a negligible effect which is not significant.

Disturbance from people and plant movements

11.9.53 The movement of people and plant during the construction phase has potential to cause visual disturbance to nesting birds. Identifying the impact on different species and individuals is difficult as their tolerance to visual disturbance and their ability to habituate will vary. Again, these impacts are only likely to be significant at the very edge of the reedbed, not within the reedbed/dense scrub where the Schedule 1 species nest. Further, these species have been consistently recorded on site, including during the construction of K3 and the nearby AD Plant.

11.9.54 Therefore, the magnitude of the impact of disturbance from people and plant movement on this feature of low value is negligible. The effect would be assessed negligible and is therefore not significant.

Noise

11.9.55 Noise created during the construction phase has the potential to disturb breeding birds causing them to cease feeding or fly away from the area of influence. It is recognised that short, sharp 'percussive' noises have the greatest potential to cause disturbance.

11.9.56 Noise created during the construction phase from impact piling and other construction activities has the potential to disturb birds breeding in the area to cause them to fail to establish a breeding territory or abandon their attendance at a nest.

11.9.57 The nearest significant area of habitat for nesting birds is immediately to the reedbed to the north of the development site. Noise modelling for this area (Figure 11.4) demonstrates that the maximum noise during the construction period for this area (during impact piling) would be 72.6dBL_{Amax}, with the majority of noise occurring between 65<70dBL_{Amax}.

11.9.58 Given that there is some potential for noise of this level to disturb breeding Schedule 1 species, as described above and as to be described in the CEMP, impact piling will avoid the nesting bird season (April to August inclusive).

11.9.59 Other construction activities are unlikely to generate noise as 'loud' as piling but may still disturb birds. Modelling of HGV reversing signals shows that the noise associated with this would be around 50 - 55 dBL_{Amax} (Figure 11.5) across the areas of dense scrub surrounding the reedbed. This is below the impact threshold that Natural England suggest should be used for further investigation with respect to noise disturbance of birds.

11.9.60 As such, the impact of construction noise on the Schedule 1 breeding bird assemblage of low value, would be would be negligible. The effect would be assessed negligible and therefore is not significant.

Reptiles (Low value)

Habitat Loss

11.9.61 Assuming it is restored to its pre-development state, the WKN Site would comprise a matrix of spoil piles, ephemeral habitats and small areas of grassland which may support reptiles. The areas of habitat created within the K3 Site that would fall within the WKN Site would be grassland and scrub, both of which provide suitable habitat for reptiles. All of the onsite habitat will be lost to facilitate WKN Proposed Development, albeit some will only be lost, temporarily during construction, as it will be re-instated on completion of the development(the laydown area and areas of habitat creation in the final WKN Site).

11.9.62 In order to mitigate the habitat loss, additional new habitat will be created post development at the eastern end of the WKN Site, with enhanced habitat creation within the area of what is currently made ground on the laydown area.

11.9.63 The WKN Site was temporarily cleared of reptiles and other ecological constraints as part of the construction of K3, prior to the commencement of construction, following the Ecological Mitigation and Enhancement Strategy (EcoIMES) produced for the original K3 application (Appendix 11.4). Therefore, there is no requirement to move animals from this area prior to the construction of the WKN Proposed Development. Common lizards and slow worms were also found during the autumn 2018 surveys, within the area to the east of the application boundary, and along the Knauf jetty track, which is to be used as the laydown / laydown access. In order to avoid killing/injuring reptiles during site clearance temporarily during construction, the population of reptiles will be moved out of the construction zone, via a two-stage, sensitive strim, prior to construction works beginning on site. A final destructive search of potential shelter locations (such as rubble piles) will also be undertaken.

11.9.64 The site will then be protected from accidental movement of plant into retained habitats by reptile-proof fencing, which will remain *in-situ* for the entire construction phase of the development.

11.9.65 On completion of the construction phase of the development, the reptile exclusion fencing will be removed, and the reptile population will be allowed to colonise the newly-created habitat on site.

11.9.66 Therefore, while there will be an overall like-for-like habitat creation/lost, much of the creation will take place at the end of the construction phase. Therefore, for the duration of construction, there will be a medium negative impact on this low value receptor. This would result in a slight effect which is not significant.

Annual beard-grass (Low value)

11.9.67 A large area of habitat was created in association with the original K3 development, to address impacts to annual beard-grass when the WKN Site was cleared. This involved selected areas of the pond margins/banks being maintained as bare ground on an annual basis, by regular scraping of the bank surface to remove regenerating vegetation particularly any competitive species.

11.9.68 In the first year of the creation of the attenuation ponds, seeds were collected from annual beard-grass plants growing on the wider site. Annual beard-grass flowers from June to August and it is anticipated that seed could be collected from July to September. Seed which has been collected was directly sown in the newly-created bare areas along the banks of the attenuation ponds.

11.9.69 It is anticipated that attenuation ponds created on site as part of the WKN Proposed Development will follow similar principles, to be described in an updated Ecology Mitigation and Management Plan(Appendix X)..

11.9.70 Therefore, it is considered that, at a baseline of prior to the K3 construction (i.e. – ephemeral/ rubble / open ground), construction impacts to this population of low value would be negligible. This would result in a negligible effect which is not significant.

WKN Proposed Development Operational Effects

11.9.71 The operational phase of the WKN Proposed Development is assumed once the facility has been commissioned (circa 2023/24).

11.9.72 Operational activities may potentially cause:

- changes in air quality;
- degradation and loss of habitats, e.g. from pollution and lack of or inappropriate management;
- degradation to and loss of habitats that support species of conservation importance, e.g. from pollution and lack of or inappropriate management;
- changes in hydrology/water quality; and
- disturbance to wildlife, e.g. from noise or light pollution, human activity and vehicular movement.

The Swale SPA / Ramsar (Very High Value)

11.9.73 The operation of the proposed second outfall into The Swale will follow the same restrictions set out in the approved Marine Licence for the first outfall constructed to serve K3. The ecological effects of the operation of the second outfall on this receptor are described in Appendix 11.7. The operation of the second outfall was approved by the MMO following a licence amendment May 2019 (licence ref. L/2017/00482/2 - Appendix 11.7). The conclusion of the assessment is that the operation of the outfall would have no effect on The Swale and, as such, all effects are not significant.

Drainage

11.9.74 As outlined in Chapter 10 Water Environment, the WKN Proposed Development will be split into two separate drainage systems. The first drainage system will collect clean surface water runoff (for example from building roof areas) and store it in the lagoon. The second drainage system will collect 'dirty' runoff (for example

from the FGT area) and store it in the 'dirty' water tank. This 'dirty' water will then be used in the process as required (for example for ash quenching). The clean water will be stored in the lagoon and used to top up the 'dirty' water tank. If the lagoon has reached the maximum acceptable capacity it will be discharged at a controlled rate into The Swale, as for K3.

11.9.75 Therefore, it is considered likely that the magnitude of the impacts of changes to drainage during operation on a feature of very high value would be negligible. This would result in a slight effect and is therefore not significant.

Light spill

11.9.76 Light spill from the operational development has the potential to impact nearby wildlife. To avoid such impacts, the light scheme for the operational phase will follow best practice to minimise light impacts. Appendix 11.8 provides a draft lighting design, based on the indicative layout for the WKN Proposed Development. This demonstrates that lighting would be down to 0 lux at the boundary for the majority of the site and within 20 m of the boundary at the north western end of the site. The final design of such a scheme will be secured through an appropriate requirement within the DCO. However, the Kemsley Paper Mill site runs a 24/7 operation and there is therefore process-necessary lighting on site currently. Therefore, the magnitude of the impact of any additional lighting on a feature of very high value would be negligible.

11.9.77 This would result in a slight effect and is therefore not significant.

Disturbance from people and plant movements

11.9.78 The movement of people during the operational phase of the development may be visible to a small proportion of the SPA/Ramsar cited bird species using the intertidal areas of the SPA/Ramsar. It is considered there is a limited potential for disturbance to be caused by people when account is taken of the fact that:

- The SPA/Ramsar cited bird species feeding on the intertidal area adjacent to the WKN Site are already habituated to people using the Knauf Jetty, industrial areas behind the seawall and public footpath along the seawall itself.

- The majority of SPA/Ramsar cited bird species on the intertidal area during all phases of the tide will be screened from people movement by the sea wall, buildings and topographical features and the concentrations occurring on the opposite bank of The Swale are over 500 m from the WKN Proposed Development and separated by the river channel and seawall.

11.9.79 Therefore, it is not anticipated that SPA/Ramsar cited birds will be disturbed by plant or people movement during the operational phase. As such, the magnitude of the impacts of disturbance from people and plant movement during operation on a feature of very high value would be negligible. This would result is a slight effect and is therefore not significant.

Recreational disturbance

11.9.80 The potential for disturbance to SPA/Ramsar cited bird species from recreational use of the operational staff is considered low. The operational nature and characteristics of the wider Kemsley Paper Mill Site mean that access is restricted, and measures are already in place to prevent incursion outside of defined areas. It is estimated that no more than 50 permanent staff will be present at any one time during the operational phase. Therefore, it is not anticipated that large numbers, if any, of the staff will access the sea wall overlooking the Swale SPA, causing disturbance to birds. As such, the magnitude and significance of the impacts/effects of recreational disturbance during operation on a feature of very high value would be no change and is therefore not significant.

Operational noise

11.9.81 It is considered that there is a low potential for sudden noises during the operational phase of the development to cause disturbance impacts on SPA/Ramsar cited birds.

11.9.82 Sudden noise created during the operational phase including HGV movements and other plant activities has the potential to disturb birds wintering in the area to cause them to cease feeding or fly away from the area of influence.

11.9.83 Operational noise modelling presented in Figure 7.3 and 7.5 of Chapter 7 show that no operational noise levels (including that of HGV movements upon the nearby marsh harrier) are not expected to exceed 40 dB.

11.9.84 On this basis, the magnitude and significance of the impacts/effects of operational noise during operation on a feature of very high value would be no change and is therefore not significant.

Air quality

11.9.85 Appendix 5.4 provides an analysis of the combined impacts of emissions to air of the K3 Proposed Development with the WKN Proposed Development on the features of interest of the surrounding designated sites along with the supporting habitats.

11.9.86 The operational effects of air quality arising from traffic (circa 250 movements per day, Chapter 4 – Transport) have been modelled in Appendix 5.4 of Chapter 5, which were modelled at a selection of discrete receptor points at the closest point of the habitat site to a road adjacent to roads affected by the WKN Proposed Development and K3 Proposed Development.

11.9.87 Cumulative traffic data for the WKN Proposed Development and K3 Proposed Development in the opening year of WKN, 2024 was modelled. The PC from the WKN and K3 stack emissions at each of the sensitive receptors was added to the road contribution to give a 'WKN + K3' PC that considers both stack and traffic emissions.

11.9.88 Only the Swale SPA/SSSI/Ramsar and the Medway Estuary and Marshes SPA/Ramsar are within 200 m of a road affected by the WKN Proposed Development and K3 Proposed Development. The A249 passes through the

Medway Estuary and Marshes SPA/Ramsar so receptors were selected at the roadside.

11.9.89 For NO_x, the cumulative PC as a percentage of the CL is less than 1% for the Medway Estuary and Marshes SPA/Ramsar. At both the Swale SPA/SSSI/Ramsar and the Medway Estuary and Marshes SPA/Ramsar, the PEC is less than the CL. On that basis, the cumulative effects are considered insignificant.

11.9.90 For N deposition the cumulative PC as a percentage of the CL is less than 1% for both the Medway Estuary and Marshes SPA/Ramsar and the Swale SPA/SSSI/Ramsar and the cumulative impacts are considered insignificant.

11.9.91 The cumulative PECs presented in Appendix 5.4 can be considered highly conservative as the PCs from the other developments are the maximum impacts across a grid and are unlikely to occur at the same location as the maximum road contribution. On this basis, all impacts as a results of traffic emissions are negligible, and as such, are not significant.

11.9.92 Based on current Environment Agency guidelines [Ref 11.13] and the Institute of Air Quality Management Position Statement [Ref 11.14], for all pollutants (NO_x, NH_3, SO_2, nutrient nitrogen deposition and acid deposition), either the Predicted Environmental Concentration (PEC) did not exceed the Environmental Quality Standard (EQS) or the Process Contribution (PC) was <1% of the EQS for the majority of interest features and supporting habitats of the designated sites. Therefore, all impacts as a result of the operation of the K3 Proposed Development are negligible and, as such, are not significant.

11.9.93 One interest feature where this was not the case was Eurasian reed warbler and reed bunting for The Swale SPA with respect to nutrient nitrogen deposition where the PC>1% of the minimum critical load and the relevant minimum critical load is already exceeded. Both species are associated with reedbed habitats within which they breed across The Swale. Neither species has been recorded breeding within the DCO boundary nor within the reedbed to the north of the WKN Site. However, they may be present in the wider area, Coldharbour Fleet to the north west, for example.

11.9.94 Notwithstanding this, reedbed habitats in north Kent are unlikely to be very sensitive to nutrient nitrogen deposition. The APIS website from which the information with respect to critical loads is derived incorporates reedbed with other wetland habitats such as marsh and fens. It notes that the minimum critical load for these habitats listed on APIS and used in Appendix 5.4 (15 $kgN.ha^{-1}.yr^{-1}$) represents more closely upland habitats that will be naturally more nutrient poor and therefore more susceptible to species composition change due to atmospheric nitrogen input. Reedbeds are, by their nature, monospecific, dominated by common reed. As such, their susceptibility to competitive exclusion by other graminoid species is considered very low. The upper end of the critical load range is therefore considered more appropriate for these habitats, set within grazing marsh which are higher nutrient systems due to the underlying nutrient status of the soils within the flood plain on which they form. Using the upper critical load for this habitat of 30 $kgN.ha^{-1}.yr^{-1}$ is therefore more appropriate meaning that the PC becomes ≤1% of this critical load and, as such, is not significant.

Overshadowing/line of sight

11.9.95 During the operational phase of the development there is no potential for the WKN Proposed Development to overshadow the SPA/Ramsar and block clear lines of sight for the bird species utilising the intertidal area, thereby causing them to abandon current feeding and roosting areas. As a single-line facility, the main buildings are likely to be somewhat smaller than those of K3 which do not overshadow the intertidal areas.

11.9.96 As such, no impacts are anticipated with both magnitude and significance being no change and therefore not significant.

Flight lines

11.9.97 Observations as part of the intertidal bird surveys and general observations on during the breeding bird survey have shown that the main flight lines for SPA/Ramsar species in the vicinity of the proposal are offshore, with no waterbirds being noted to fly over the site.

11.9.98 Given that the area surrounding the WKN Site is already heavily industrialised, and that there are no wetland waterbodies within the vicinity of the SPA/Ramsar where the flight path would be across the development site, it is considered that the WKN Proposed Development will not impact the flight lines of SPA/Ramsar bird using the Swale.

11.9.99 As such, the magnitude of the impacts of disturbance from people and plant movement during operation on a feature of very high value would be no change and is therefore not significant.

Medway Estuary and Marshes SPA and Ramsar, Thames Estuary and Marshes Ramsar and SPA, Outer Thames Estuary SPA and Queendown Warren SAC (Very High Value)

11.9.100 The impact of the operational phase of the development on these designated sites is described in detail in Appendix 11.2: Information to Inform a Habitats Regulations Assessment.

11.9.101 At a distance of >2 km between the WKN Proposed Development and these designated sites any hydrology/water quality overshadowing, flight lines, operational noise, lighting and disturbance from human activity from the operational phase of the development are unlikely to have significant impacts.

11.9.102 Appendix 5.4 provides an analysis of the impacts of emissions to air of the WKN Proposed Development on the features of interest of the SPAs and SAC. For all pollutants (NO_x, NH_3, SO_2, nutrient nitrogen deposition and acid deposition), either the Predicted Environmental Concentration (PEC) did not exceed the Environmental Quality Standard (EQS) or the Process Contribution (PC) was <1% of the EQS for all interest features of the SPAs and SAC. Therefore, no impacts on the SPA interest features as a result of the operation of the Proposed Development are predicted.

Swale Estuary MCZ (High Value)

11.9.103 The Swale MCZ is located (at its closest) 25 m east of the site. It is a sub-tidal designated site and therefore there is no potential for disturbance of interest features during the operation of the WKN Proposed Development.

Drainage

11.9.104 The WKN Proposed Development will be split into two separate drainage systems. The first drainage system will collect clean surface water runoff (for example from building roof areas) and store it in the lagoon. The second drainage system will collect 'dirty' runoff (for example from the FGT area) and store it in the 'dirty' water tank. This 'dirty' water will then be used in the process as required (for example for ash quenching). The clean water will be stored in the lagoon and used to top up the 'dirty' water tank. If the lagoon has reached the maximum acceptable capacity it will be discharged at a controlled rate into The Swale. The effects of this discharge are considered within the attached marine impact assessment (Appendix 11.7) which led to the granting of an amended Marine Licence by the MMO in May 2019 (licence ref. L/2017/00482/2 - Appendix 11.7).

11.9.105 Therefore, it is considered likely that the magnitude of the impacts of changes to drainage during operation on a feature of very high value would be negligible. This would result in a slight effect and is therefore not significant.

Water quality

11.9.106 As described in Chapter 10 Water Environment, any clean surface water overflow from the WKN Proposed Development will be discharged to The Swale via a new outfall pipe installed in the sea defence alongside the existing K3 outfall, at a controlled rate.

11.9.107 The drainage water outfall has the potential to discharge at any time when the attenuation pond is full, although the presence of a high tide valve in the outfall will stop any discharge during high tide events.

11.9.108 Discharge of water from the WKN Proposed Development storage areas (i.e. water containing waterborne contaminants) to The Swale MCZ will not occur during the commissioning phase or during the lifetime of the project.

11.9.109 Therefore, it is considered that the magnitude of the impact on the features of The Swale MCZ (a high value receptor) would be negligible. This would result in an effect of slight significance which is not significant.

The Swale SSSI and Medway Estuary & Marshes SSSI Elmley NNR (High value)

11.9.110 All operational impacts to these sites are the same as for the corresponding SPA/Ramsars described above. As such, it is considered that the magnitude of the impacts of the development on these features of high value, would be negligible. This would result in a slight effect which is not significant.

Milton Creek Local Wildlife Site (Medium Value)

11.9.111 Given the distance between the WKN Site and Milton Creek, all impacts on the LWS during operation of WKN Proposed Development would be similar in nature to The Swale but of a lower magnitude. As such, all impacts to this receptor of medium value would be of negligible magnitude and significance and, as such, not significant.

Annual beard-grass (low value)

11.9.112 The main impacts to annual beard-grass from the operational phase of the development will be the gradual loss of open bare ground habitat from a lack of appropriate management. This has the potential, if unmitigated, to cause the loss of annual beard-grass from the proposal site when taken in combination with the habitat loss which would have occurred in the construction phase.

11.9.113 However, an updated Management Plan for the WKN Site has been produced (Appendix 11.4) that will ensure that the species is maintained on site. It is considered likely that all operational impacts on this population of low value, has the potential to be of negligible magnitude resulting in a negligible significance of effect which is therefore not significant.

Reptiles (low value)

11.9.114 As the development will be in operation 24hrs a day, there is potential for traffic to cause fatalities to reptiles whilst they are moving across the proposal site foraging and basking. However, the likelihood of this occurring is small, given the proposal site speed limit is likely to be restricted to a low speed and that reptiles readily feel vibrations and oncoming traffic would be detected by individuals which would move out of roadways.

11.9.115 Within the proposal site there is potential for a lack of management, allowing scrub encroachment within open habitats such as the grassland. However, the Ecology Management and Mitigation Strategy (Appendix 11.4) will set out a regime of habitat management, including ensuring that dense structured vegetation does not overtake the grassland habitats on site, whilst still providing enough cover and foraging habitat for reptile species and there is no predicted adverse impact in the medium term.

11.9.116 As such, the magnitude of the impacts of changes to habitat management during operation on a feature of low value would be negligible. This would result is a negligible effect and is therefore not significant.

Breeding Schedule 1 birds – non-SPA (low value)

11.9.117 The main impacts to breeding birds from the operational phase of the development are likely to be increased disturbance from operational noise, pedestrians and traffic, potential for 24-hour lighting to spill onto the habitats used for breeding and habitat loss.

Light spill

11.9.118 Given the development will be active 24hrs a day, there is potential for light spill from the operational phase to impact the birds nesting both within the proposal site and within the reedbed to the north. Therefore, to mitigate such an impact, as described above, the light scheme for the operational phase will follow best practice to minimise light impacts. It will include street lighting located on the site buildings to provide illumination to roads, car parks and hard standing areas.

11.9.119 The street lighting will be fitted with a flat glass profile to minimize light spill. The lighting levels for the final operational plant will be designed to drop to a level of 1lux (bright moonlight) at the site boundary. Appendix 11.8 provides a draft lighting design, based on the indicative layout for the WKN Proposed Development. This demonstrates that lighting would be down to 0 lux at the boundary for the majority of the site and within 20 m of the boundary at the north western end of the site. There will therefore be no impact from the operational lighting on this low value feature.

Disturbance from people and plant movements

11.9.120 The movement of people and plant during the operational phase has potential to cause visual disturbance to nesting birds. Identifying the impact on different species and individuals is difficult as their tolerance to visual disturbance and their ability to habituate will vary. However, this is likely to be a significant impact only immediately adjacent to the main works areas, for example birds within the centre of the reedbed habitat to the north of the site are unlikely to be disturbed and are already adapted to a high-noise environment from the operational Kemsley Paper Mill.

11.9.121 As such, the magnitude of the impacts of disturbance during operation on a feature of low value would be negligible. This would result is a negligible effect and is therefore not significant.

Operational noise

There are two potential impacts on breeding birds from the operational noise:

- Masking noise
- Sudden operational noises causing disturbance

11.9.122 A possible effect of the operational background humming noise caused by the plant is the 'masking' of bird songs or calls by similar noise frequencies, thereby reducing the distance over which the song or call can be heard. Two of the most important functions of avian acoustic signals are territory defence and mate attraction [Ref 11.19]. Interference with acoustic communication and especially territorial song, presents a substantial problem to breeding birds. For a song, alarm call or another sound to give rise to a response from a bird, the sound must be detectable against the background noise. The detectability of a sound is determined by the signal-to-noise ratio (SNR) and the detection ability of the bird. Within a given frequency band, signals with an SNR below the detection threshold of the listening bird are 'masked'. As a result, background noise is important in determining which birds can hear a sound and the quality of the message contained within that sound [Ref 11.19]. Continuous noise may also mask the arrival of predators or the associated alarm calls given by neighbouring birds.

11.9.123 Of the Wildlife and Countryside Act Schedule 1 bird species breeding in close proximity to the WKN Site, only Cetti's Warbler has a defined territorial song which could be used for modeling of masking noise.

11.9.124 An audio sample of Cetti's Warbler song (recorded by Andrew Carter, Salisbury, Wilts) was processed using Matlab software (specifically the 'Signal Processing Toolbox') to calculate the power spectral density (psd) of the file. The psd describes how the power of a signal or time series is distributed with frequency. The psd of the song sample indicated that the dominant frequencies of the song were within the range of the 4,000Hz octave band, which extends from approximately 2,840Hz to 5,680Hz.

11.9.125 Noise emission levels from the facility at various features have been predicted in terms of octave-band LAeq spectra using a detailed computer noise model. Baseline background noise levels (in terms of octave-band LA90, which is the level that is occurring for 90% of the time and therefore an appropriate parameter for the assessment of masking effects to communication of the continuous operational noise from the facility) for the reedbed area were determined by a survey over five days during 2009 to inform the original K3 application (i.e. pre K3 operational).

11.9.126 The results of the noise prediction indicate that the majority of acoustic energy emitted from the facility is at low-frequencies (< 500 Hz) and that the emissions in the 4,000 Hz octave band, representing the frequency range within which the Cetti's Warbler song transmission is expected to be most significant, are relatively low. The measured baseline background noise levels in the 4,000Hz band for a nominal three-hour period between 03.00 and 07.00 hours that is representative of the dawn chorus were between 19 and 28dB LA90, 15-min (the mean level was 24dB). The greatest predicted operational noise emission level from the facility was 10dB LAeq in the 4,00 Hz band at the reedbed, 50m from the facility. Noise emission levels decrease with increasing distance from the facility.

11.9.127 The intelligibility of an acoustic signal, in this case the song of the warbler, will be affected by the difference between this signal and the prevailing noise level. The predicted noise emission level at the reedbed (50m) would not be expected to increase the mean background noise level between 03.00 and 07.00 hours in the 4,000 Hz octave-band (for example, 19dB + 10dB = 19.5dB and 24dB + 10dB = 24dB). On this basis, no effect is predicted on Cetti's Warbler due to masking by operational noise.

11.9.128 Operational noise modelling presented in Figure 7.3 and 7.5 of Chapter 7 show that no operational noise levels are expected to exceed 55 dB. On this basis, the magnitude and significance of the impacts/effects of sudden operational noise during operation on a feature of low value would be no change and is therefore not significant.

Lack of management

11.9.129 Within the proposal site there is potential for habitat loss caused by a lack of management allowing scrub encroachment within open habitats such as the grassland and within the reedbed within the attenuation ponds.

11.9.130 To mitigate this, however, a detailed management regime will be put in place to ensure that this lack of management does not occur. Once mitigation is therefore accounted for, the magnitude of the impacts of changes to habitat due to lack of management during operation on a feature of low value would be negligible. This would result is a negligible effect and is therefore not significant.

WKN Proposed Development Decommissioning

11.9.131 Although the exact nature of how decommissioning/demolition of the WKN Proposed Development is not currently know, impacts from such activities would be similar to those generated during construction. All effects arising from such impacts would be addressed via the production of a Decommissioning and Demolition Environmental Management Plan, to be produced prior to such work as per a requirement in the DCO.

Table 11.**6**: Residual effects arising from the development

Mitigation summary – K3 Proposed Development

11.9.132 Mitigation for the K3 Proposed Development was set out in the approved Ecology Mitigation and Management Plan (EMMP – Appendix 11.4). No further mitigation is considered necessary as the practical effects on ecology of the K3 Proposed Development (i.e. those above the effects already consented and mitigated by the existing permission) are all not significant.

Mitigation summary – WKN Proposed Development

11.9.133 Mitigation for the WKN Proposed Development to be secured via the CEMP (draft included at Appendix 2.1) will include:

General mitigation - Dust

11.9.134 Standard, best practice dust-suppression methods (see Chapter 5 Air Quality) will be used throughout construction of the development, thereby avoiding any impacts as a result of dust settlement on habitats and species.

General mitigation - lighting

11.9.135 Lighting strategies for both construction and operation will be developed to follow all good-practice to minimise lighting impacts such that lighting levels at the site boundary will be no more than 1 lux (bright moonlight). Appendix 11.8 provides a draft lighting design, based on the indicative layout for the WKN Proposed Development. This demonstrates that lighting would be down to 0 lux at the boundary for the majority of the site and within 20 m of the boundary at the north western end of the site. The final design will be secured via an appropriate Requirement within the DCO.

General mitigation - piling

11.9.136 in order to avoid impacts to the birds using the intertidal area and marsh harrier, impact piling would be undertaken during the following periods:

- No impact piling between April and August, inclusive;
- No impact piling between the months January and February inclusive.
- Limited impact piling is permissible between the months of November and December provided that any impact piling activity does not accrue to more than a total of 10 days consecutively or otherwise.

11.9.137 Impact piling is permissible unrestricted outside of these time periods. All other methods of piling using non-impact methods can be used without restriction.

General mitigation – Visual disturbance:

11.9.138 A 2.4 m closed-board wooden fence has been erected along the northern site boundary (as part of the previous clearance works for the K3 laydown), following the Ecological Mitigation and Enhancement Strategy which was prepared for the site (Appendix 11.4). Such a fence will also be erected around the proposed laydown area.

General mitigation – drainage/water quality

11.9.139 Full details of the mitigation with respect to drainage/water quality during both construction and operation are provided in Tables 10.14 and 10.15 in Chapter 10 Water Environment. These details will also be provided in the CEMP (Appendix 2.1).

Habitats and species

11.9.140 The following mitigation will be secured via an updated Ecology Mitigation and Enhancement Plan (Appendix 11.4):

Annual bearded-grass

11.9.141 Annual beard-grass is an annual species which grows on bare muddy patches. Areas along the banks of the attenuation pond will be suitable to establish and maintain these conditions.

11.9.142 Selected areas of the pond margins/banks should be maintained as bare ground on an annual basis, by regular scraping of the bank surface to remove regenerating vegetation particularly any competitive species.

11.9.143 Annual beard-grass flowers from June to August and seed should be collected from July to September. Annual beard grass seed shall be directly sown in the newly-created bare areas along the banks of the attenuation ponds.

11.9.144 Monitoring of the success of the habitat creation will be undertaken for the following year after construction works.

Reptiles

11.9.145 The areas of reptile habitat on site are to be lost to facilitate the laydown area for WKN. Therefore, the Ecology Mitigation and Enhancement Strategy and CEMP will ensure that the population of reptiles are moved via the appropriate methods, to

ensure that none are harmed during the works. Therefore, the following will be implemented during such works:

- Clearance will be undertaken at a time of the year when amphibians and reptiles are active (March to October) and during suitable weather conditions for them to be mobile (reasonably warm, no rain).

- Vegetation will be hand strimmed under the supervision of an ecological clerk of works (ECOW) to an initial height of 15 cm. It will be strimmed directionally, towards retained habitat. A second cut will be made to ground level at least 24 hours later to enable animals time to move away from the works area.

- Following the strimming, a destructive search will take place; this will be performed under the guidance and watching brief of an experienced ecologist, who will be present to capture any amphibians disturbed by the process, as mentioned above.

- The development site will be surrounded with suitable reptile fencing to discourage re-entry of any reptiles once they have moved out of the area. The location may need to be tweaked during installation to avoid retained vegetation.

11.9.146 On completion of the construction phase of the development, the laydown area will be re-instated, post-development, to the grassland / scrub mosaic which was present pre-construction. The reptile fence will then be removed (under the supervision of an ecologist) and any reptiles allowed to re-colonise the area.

11.9.147 As areas of suitable reptile habitat were previously lost during the construction of the K3 laydown, appropriate methods were used to remove/deter reptiles from using these areas to prevent accidental injury or death during construction works.

11.9.148 Reptiles were caught by installing an exclusion barrier fence around the reptile habitats that were lost, followed by placing artificial refugia within the area. Selective strimming of vegetation removed the extent of potential cover encouraging reptiles to use the artificial refugia. Animals using the refugia were caught and moved to a prepared receptor area.

11.9.149 The receptor site approximately matches the area of habitat from which the reptiles are being translocated, and habitats of high value for reptile species were established.

11.9.150 The receptor site is located towards the eastern end of the K3 Site. This area was previously sub-optimal habitat (ruderal) which was seeded and continues to be managed for reptiles as a grassland/scrub mosaic, with two hibernacula created (constructed from pieces of wood and rubble and part buried and capped with top soil) into which the reptiles were placed when first released on to the site.

11.9.151 The shading of the banks of the attenuation ponds by planted trees has been limited, especially on the south sides of any banks thereby creating an increase in basking areas available to reptiles.

11.9.152 Tussock-forming grassland such as cock's-foot *Dactylis glomerata* and tufted hair-grass *Descampsia cespitosa* has been planted on the banks of the attenuation ponds, to provide ideal basking, foraging and hibernation sites for reptiles.

11.9.153 Piles of dead vegetation, grass clippings etc will be heaped up in discrete piles along the bank of the attenuation pond to provide nesting sites for grass snakes. These will be positioned where they are unlikely to be disturbed during the summer months.

11.9.154 In addition, the bare ground currently present within the laydown area will be seeded with a similar tussock-forming grassland mix and planted with areas of scrub to further increase the area of reptile habitat post-development. Also, although off-site, the construction of the reedbed described below has led to the creation of 0.6 ha of additional tussocky grassland with associated benefits for reptiles and other wildlife.

Breeding birds (non-SPA)

11.9.155 The creation and retention of the attenuation pond with associated marginal vegetation on the WKN Site for other protected species will directly benefit a wide variety of breeding birds and the grassland / scrub habitat creation will provide a mosaic of vegetated areas to encourage breeding birds. Whilst tree and scrub screening landscaping once mature will provide enhanced nesting habitat.

Monitoring

11.9.156 Post-development monitoring surveys to assess the success of the mitigation outlined above will be carried out over the first five years after completion and any issues, such as the loss or reduction in any of the populations of species of conservation concern rectified through the implementation of appropriate strategies to be drawn up as necessary.

Reedbed

11.9.157 In addition to the on-site mitigation to be secured via the EMMP described above, a 1 ha reedbed along with circa 0.6 ha of tussocky grassland and 250 m of new ditch has already been established at Hartey Fen on the Isle of Sheppey to provide alternative breeding habitat for Marsh Harrier during construction as well as enhanced water vole and reptile habitat.

11.9.158 Given that, to date, Marsh Harrier has carried on nesting at the Kemsley reedbed, this new habitat on the Isle of Sheppey represents a significant enhancement for ecology.

11.10 Residual Effects of the K3 and WKN Proposed Developments

11.10.1 Residual effects are those that are predicted to remain after implementation of the mitigation measures described above. The residual effects are summarised in Table 11.7.

Significant residual effect	Receptor sensitivity	Impact magnitude	Nature	Duration	Degree of effect	Level of certainty
Construction						
The Swale SPA / Ramsar – Habitat Loss	Very High	No change	No impact	Long-term	**Not significant**	Certain
The Swale SPA / Ramsar - Drainage	Very high	Negligible	Slight	Short-term	**Not significant**	Reasonable
The Swale SPA / Ramsar – Light spill	Very high	Negligible	Slight	Short-term	**Not significant**	Reasonable
The Swale SPA / Ramsar – disturbance from people / plant	Very high	Negligible	Slight	Short-term	**Not significant**	Reasonable
The Swale SPA / Ramsar – Recreational disturbance	Very high	Negligible	No impact	Short-term	**Not significant**	Reasonable
The Swale SPA / Ramsar – Noise / vibration	Very high	Negligible	Slight	Short-term	**Not significant**	Reasonable
The Swale SPA / Ramsar - Overshadowing / line of sight	Very high	No change	No impact	Short-term	**Not significant**	Certain
The Swale SPA / Ramsar – Flight lines	Very high	No change	No impact	Short-term	**Not significant**	Certain
Medway Estuary and Marshes SPA / Ramsar – all effects	Very high	No change	No impact	Long-term	**Not significant**	Reasonable
Thames Estuary and Marshes SPA / Ramsar – all effects	Very high	No change	No impact	Long-term	**Not significant**	Reasonable
Outer Thames Estuary SPA / Ramsar – all effects	High	No change	No impact	Short-term	**Not significant**	Certain

Queensdown Warren SAC – all effects	High	No change	No impact	Short-term	**Not-significant**	Certain
Swale Estuary MCZ – drainage	High	Negligible	Slight	Short-term	**Not-significant**	Reasonable
Swale SSSI – all effects as for SPA/Ramsar	High	Negligible	Slight	Short-term	**Not-significant**	Reasonable
Medway Estuary and Marshes SSSI – all effects as per SPA/Ramsar	High	No change	No impact	Short-term	**Not-significant**	Reasonable
Elmley Island NNR – all effects as per SPA/Ramsar	High	Negligible	Slight	Short-term	**Not-significant**	Reasonable
Milton Creek LWS – all effects as per SPA/Ramsar	Medium	Negligible	Negligible	Short-term	**Not-significant**	Reasonable
Breeding bird (non-SPA) – habitat loss	Low	Negligible	Negligible	Long term	**Not-significant**	Reasonable
Breeding bird (non-SPA) – drainage	Low	Negligible	Negligible	Short term	**Not-significant**	Reasonable
Breeding bird (non-SPA) – lighting	Low	Negligible	Negligible	Short-term	**Not-significant**	Reasonable
Breeding bird (non-SPA) – movement of people / plant	Low	Negligible	Negligible	Short-term	**Not-significant**	Reasonable
Breeding bird (non-SPA) – noise	Low	Negligible	Negligible	Short-term	**Not-significant**	Reasonable
Reptiles – habitat loss	Low	Negligible	Negligible	Long-term	**Not-significant**	Reasonable

Annual beard grass – habitat loss	Low	Negligible	Negligible	Long-term	**Not-significant**	Reasonable
Operational Phase						
The Swale SPA / Ramsar – Drainage	Very high	Negligible	Slight	Long-term	**Not-significant**	Reasonable
The Swale SPA / Ramsar – light spill	Very high	Negligible	Slight	Long-term	**Not-significant**	Reasonable
The Swale SPA / Ramsar – disturbance of people and plant	Very high	Negligible	Slight	Long-term	**Not-significant**	Reasonable
The Swale SPA / Ramsar – recreational disturbance	Very high	No change	No impact	Long-term	**Not-significant**	Reasonable
The Swale SPA / Ramsar – Operational noise	Very high	No change	No impact	Long-term	**Not-significant**	Reasonable
The Swale SPA / Ramsar – Air quality	Very high	Negligible	Slight	Long-term	**Not-significant**	Reasonable
The Swale SPA / Ramsar – Overshadowing / line of sight	Very high	No change	No impact	Long-term	**Not-significant**	Reasonable
The Swale SPA / Ramsar – Flight lines	Very high	No change	No impact	Long-term	**Not-significant**	Reasonable
Medway Estuary and Marshes SPA / Ramsar – Air quality	Very high	Negligible	Slight	Long-term	**Not-significant**	Reasonable
Thames Estuary and Marshes SPA – Air quality	Very high	Negligible	Slight	Long-term	**Not-significant**	Reasonable
Queendown Warren SAC – Air quality	Very high	Negligible	Slight	Long-term	**Not-significant**	Reasonable

Swale Estuary MCZ – Drainage	High	Negligible	Slight	Long-term	**Not-significant**	Reasonable
Swale SSSI – Air quality	High	Negligible	Slight	Long-term	**Not-significant**	Reasonable
Medway Estuary and Marshes SSSI – Air quality	High	Negligible	Slight	Long-term	**Not-significant**	Reasonable
Elmley Island NNR – Air quality	High	Negligible	Slight	Long-term	**Not-significant**	Reasonable
Milton Creek LWS – all effects same as SPA/Ramsar	Medium	Negligible	Negligible	Long-term	**Not-significant**	Reasonable
Annual beard grass – lack of management	Low	Negligible	Negligible	Long-term	**Not-significant**	Reasonable
Reptiles – traffic	Low	Negligible	Negligible	Long-term	**Not-significant**	Reasonable
Reptiles – lack of management	Low	Negligible	Negligible	Long-term	**Not-significant**	Reasonable
Breeding birds (non-SPA) – light spill	Low	No change	No effect	Long-term	**Not-significant**	Reasonable
Breeding birds (non-SPA) – movement of people / plant	Low	Negligible	Negligible	Long-term	**Not-significant**	Reasonable
Breeding birds (non-SPA) – noise	Low	No change	No effect	Long-term	**Not-significant**	Reasonable
Breeding birds (non-SPA) – lack of management	Low	Negligible	Slight	Long-term	**Not-significant**	Reasonable

Table 11.7: Residual effects arising from the development

11.11 Cumulative Effects

11.11.1 The purpose of this section is to assess the cumulative effects of the WKN Proposed Development and K3 Proposed Development with other developments near the site that are currently in the planning process or have been approved but are not yet constructed, as set out in Chapter 3. In order to ensure that all of the cumulative impacts from the K3 Proposed Development, WKN Proposed Development and the two combined are assessed both individually and cumulatively, the following methodology has been proposed:

- K3 Proposed Development + other cumulative developments;
- Practical effect of the K3 Proposed Development + other cumulative developments;
- WKN Proposed Development + other cumulative developments;
- WKN Proposed Development + K3 Proposed Development + other cumulative developments;
- WKN Proposed Development + practical effect of the K3 Proposed Development + other cumulative developments.
-

11.11.2 All of the relevant developments set out in Chapter 3 have been reviewed for relevance to ecology. A number are not considered any further as there are either no overlapping pathways by which cumulative effects on ecological receptors could occur (for example, residential developments), or distance (i.e. are too far away). Those that have been included are generally those that result in emissions to air.

11.11.3 The following planning applications have been considered further (planning references have been given for each project):

- 28. 16/507687/COUNTY County matters application for the construction and operation of an Incinerator Bottom Ash (IBA) Recycling Facility on land adjacent to the Kemsley Sustainable Energy Plant. Kemsley Paper Mill Ridham Avenue Sittingbourne Kent ME10 2TD. Permitted February 2017.
- 8. 16/501484/COUNTY County matter - The construction and operation of a gypsum recycling building with plant and machinery to recycle plasterboard and the re-configuration of the existing lorry park to include office/welfare facilities and ancillary supporting activities, including rain water harvesting tanks, container storage, new weighbridges, fuel tanks, hardstanding, safe lorry sheeting access platform and automated lorry wash. Countrystyle Recycling Storage Land Ridham Dock Road Sittingbourne Kent ME9 8SR. Permitted April 2016.

- 1. SW/11/1291 Anaerobic digester and associated ground profiling and landscaping. Land To The North Of The DS Smith Paper Mill, Kemsley, Sittingbourne, Kent, ME9 8SR. Permitted July 2012.

- 18. 16/506935/COUNTY County Matters application for steam pipeline connecting the Ridham Dock Biomass Facility to the Kemsley Paper Mill14/501181/COUNTY KCC Regulation 13 - Scoping opinion as to the scope of an environmental impact assessment for a proposed combined heat and power plant at Ridham B. Ridham Dock, Sittingbourne, Kent. July 2014. Ridham Docks, Sittingbourne. Permitted October 2016.

- 5. SW/15/500348 – Construction of advanced thermal conversion and energy facility (4Evergreen Technologies Ltd.)

- 17. 17/505073/FULL Erection of a tile factory including service yard, storage yard and car parking area.

- 2. SW/14/0224 – Application for a solar farm - Solar farm, comprising the erection of solar arrays of photovoltaic panels, inverter and transformer sheds, fencing, site storage cabin, combined DNO and EPC switchgear housing, internal gravel access road, and associated equipment.

- 14. SW/13/1495 Variation of condition 9 of planning permission SW/11/548 (use of building 15B to install and operate materials recycling facility (MRF) and a refuse derived fuel (RDF) facility and to use existing weighbridge, weighbridge office, site office and washroom/toilets to the south of building 15a) to allow an increase of HGV movements from 58 to 98 (49 in and 49 out) for a temporary period of 12 months;

- 16. EN010090 (18/501923/ADJ) Application for an Order Granting Development Consent to decommission the existing K1 CHP on the site and build, commission and operate a new CHP plant;

11.11.4 The potential for cumulative effects between the K3 and WKN Proposed Developments and the other proposals is dependent on those developments resulting in residual effects for the same habitats, species and populations as those using the development site.

11.11.5 Given the distance of the majority of these developments from the site (see Figure 3.2, Chapter 3), potential impacts from the various cumulative scenarios with the proposals are limited to:

- The Swale Ramsar, SPA and SSSI;
- The Medway Estuary and Marshes Ramsar, SPA and SSSI; and
- Birds including Marsh Harrier, Bearded Tit and Cetti's Warbler

11.11.6 Cumulative impacts from emissions to air are addressed separately below, followed by an assessment of other potential impacts not related to such emissions.

Cumulative emissions to air

11.11.7 Appendix 5.4 sets out an assessment of the cumulative impacts of emissions to air from all of the developments above for which data are available. here are four developments where there was sufficient detail to allow a PC to be added to give a cumulative PEC for ecological receptors:

- Kemsley K4 CHP PC (EN010090 (18/501923/ADJ))
- Kemsley AD (SW/11/1291)
- Reserve Power Plant PC (18/500393/FULL)
- Garden of England Energy Facility (15/500348/COUNTY)

11.11.8 The PCs for each of these four developments were added to the maximum PEC from the WKN and K3 Proposed developments to give a Cumulative PEC.

11.11.9 This shows that for the majority of receptors, there is no effect (i.e. either the cumulative PC<1% of the EQS and/or the cumulative PEC<EQS) of the other developments operating with the K3 Proposed Development and WKN Proposed Development.

11.11.10 As set out in Appendix 5.4, those features where an effect cannot immediately be excluded are shown in Table 5.4.11. This included Eurasian reed warbler and reed bunting for The Swale SPA and hen harrier/Merlin for the Medway Estuary & Marshes SPA with respect to nutrient nitrogen deposition where the cumulative PC>1% of the minimum critical load and the relevant minimum critical load is already exceeded. All species are associated with reedbed and grazing marsh habitats within which they breed or hunt across the two SPAs.

11.11.11 Both habitats in north Kent are unlikely to be very sensitive to nutrient nitrogen deposition. The APIS website from which the information with respect to critical loads is derived incorporates reedbed with other wetland habitats such as marsh and fens. It notes that the minimum critical load for these habitats listed on APIS and used in Appendix 5.4 (15 $kgN.ha^{-1}.yr^{-1}$ for reed warbler and reed bunting and 10 $kgN.ha^{-1}.yr^{-1}$ for hen harrier and merlin) represents more closely upland habitats (including, heathland) that these species are also associated with elsewhere in the country and that will be naturally more nutrient poor and therefore more susceptible to species composition change due to atmospheric nitrogen input than those in Kent. Reedbeds are, by their nature, monospecific, dominated by common reed. As such, their susceptibility to competitive exclusion by other graminoid species is considered very low. The upper end of the critical load range is therefore considered more appropriate for these habitats, set within grazing marsh which are higher nutrient systems due to the underlying nutrient status of the soils within the flood plain on which they form. Using the upper critical load for this habitat of 30 $kgN.ha^{-1}.yr^{-1}$ is therefore more appropriate meaning that the cumulative PEC does not exceed the critical load and, as such, cumulative effects in combination with the K3 and WKN Proposed Developments are not significant.

11.11.12 With respect to hen harrier and merlin, the 10 $kgN.ha^{-1}.yr^{-1}$ critical load used represents upland habitats (including, heathland) that these species are also associated with elsewhere in the country and that will be naturally more nutrient poor and therefore more susceptible to species composition change due to atmospheric nitrogen input than the grazing marsh habitats over which they forage

during winter in Kent. The majority of such habitats within the Medway system are agriculturally-improved to a greater or lesser extent and therefore the upper end of the critical load range is considered more appropriate for these habitats of 30 $kgN.ha^{-1}.yr^{-1}$. On this basis, any cumulative PEC will not exceed the critical load and, as such, cumulative effects in combination with the WKN and K3 Proposed Developments would not be significant

11.11.13 Table 5.4.11 also shows an exceedance from the cumulative PEC of the minimum critical load for nutrient nitrogen for both species of breeding tern at the Medway Estuary & Marshes SPA. The minimum critical load used is 8 $kgN.ha^{-1}.yr^{-1}$ listed on APIS as representing acid stable dune grasslands. As for hen harrier and merlin, while the tern species will both use such habitats elsewhere in the country, within the Medway Estuary system, both species breed mainly on the many salt marsh islands (Burntwick Island, for example) that occur in the river channel. As such, a more appropriate critical load would be that for early-pioneer salt marsh of 30 $kgN.ha^{-1}.yr^{-1}$. Using this figure, the cumulative PEC is only 45% of the critical load meaning that the cumulative PEC does not exceed the critical load and, as such, cumulative effects in combination with the K3 and WKN Proposed Developments are not significant.

11.11.14 Table 5.4.11 also shows two supporting habitats as having exceedances for nutrient nitrogen (shingle & sea cliff on The Swale Ramsar/SSSI and Medway Estuary & Marshes Ramsar/SSSI). However, the closest area of this habitat type within The Swale is on the eastern end of the Isle of Sheppey some 12 km from any of the developments considered. While modelling has not been undertaken in this location, given the distance, cumulative effects are considered very unlikely. The modelling presented in Appendix 5.4 combines the maximum PCs from each development to give a summed PC. This is highly conservative as there would be very little overlap between where these maximum rates of deposition occurred; none of them will occur 12 km from the K3 and WKN Proposed Developments. The nearest shingle habitats to the K3 and WKN Proposed Developments within the Medway Estuary & Marshes Ramsar/SSSI are to the north west, on the north of Deadman's Island and the southern edge of the Isle of Grain where the Medway meets the Thames Estuary & Marshes Ramsar/SSSI. While some shingle beaches may be potentially very susceptible to atmospheric nitrogen inputs, in particular where the shingle is stable and becoming vegetated, the shingle that occurs in these locations within the Medway is mostly tidal, being inundated by sea water on a twice-daily basis. This means that, in this location, they are considered to be insensitive to atmospheric nutrient nitrogen deposition with their nutrient status controlled by that of the inundating tide. On this basis, no in-combination effects are predicted.

K3 Proposed Development + other cumulative developments

16/507687/COUNTY IBA Recycling Facility

11.11.15 A detailed consideration of these impacts is provided in the Ecology Statement that accompanied this planning application. The potential for cumulative effects with the K3 as consented was considered in the planning submission for the IBA. No such effects were identified. The combination of the IBA and K3 was considered acceptable with respect to the quantum of habitat to be created in the

combined development. Given that this will not change when the K3 Proposed Development is considered, no cumulative effects are considered likely.

16/501484/COUNTY Gypsum Recycling Building

11.11.16 Various developments have been proposed or are being constructed at the Countrystyle Recycling Ltd. site 350 m to the north of the proposed development. The largest of these includes 16/501484/COUNTY - Gypsum Recycling Building for which the Habitats Regulations Assessment submitted [Ref 11.20] identified potential impacts from the development with respect to changes in water quality and disturbance of wintering birds during impact piling. The proposed mitigation to avoid such impacts included a detailed surface water management plan and the timing of piling works to occur between May and September.

11.11.17 Given this, the lack of impacts associated with either of these pathways identified above from the K3 Proposed Development, no in-combination effects are considered likely.

SW/11/1291 - Kemsley AD Plant (DS Smith Paper)

11.11.18 The proposed Kemsley AD Plant is located on the far side of the reedbed immediately to the north of the DCO boundary. It is currently being commissioned, having been constructed during 2017/2018. In-combination impacts to the Swale SPA/Ramsar could occur via cumulative changes to air quality; such effects are considered above. No other in-combination effects are considered likely.

14/500327/OUT New Offices

11.11.19 The proposed creation of up to 8,000 m^2 of new Class B1 and B2 floor space along with the extension of the Milton Creek Country Park 495 m to the south of the Proposed Development is in close proximity to The Swale SPA/SSSI/Ramsar. However, potential impacts associated with the development on these sites derive from an increased recreational use of the foreshore area by visitors to the Country Park. Since there are no such increases in recreational use associated with the proposed development, there are no overlapping pathways for effects to occur with the K3 Proposed Development; therefore, there are no in-combination effects.

14/502737/EIASCO and 16/506935/COUNTY – Works at Ridham Docks

11.11.20 Ridham Docks is 1.6 km to the north of the proposed development and comprises a range of industrial uses including a biomass incinerator (constructed), Materials Recycling Facility (MRF) and various storage facilities (including wood for the biomass incinerator). All of the current applications (submitted and not determined) relate to variations to existing permissions, none of which are considered likely to have an in-combination effect with the K3 Proposed Development.

SW/15/500348 – Construction of advanced thermal conversion and energy facility (4Evergreen Technologies Ltd.)

The proposed energy facility will pyroloyse refuse-derived fuel to generate syngas that can then be burnt to generate heat and, subsequently, electricity. The process

of burning the syngas leads to the emission to air of a range of chemicals, similar to those emitted by the Proposed Development. The potential for in-combination effects as a result of such emissions is considered above. No other in-combination effects are considered likely.

17/505073/FULL Erection of a tile factory including service yard, storage yard and car parking area.

11.11.21 The application is for a new tile factory, along with a storage yard, car park and associated landscaping features. As part of the planning application, a suite of ecological surveys were undertaken, including reptile, GCN, bird, otter and water vole. The assessment also looked at impacts on the nearby designated sites, however, it was concluded that, given the site was already highly disturbed, that the slight increase in noise would not negatively impact the birds using the SPA/Ramsar, especially given the mitigation measures, such as the creation of a bund.

11.11.22 Therefore, no residual impacts remain that could result in in-combination impacts with the K3 Proposed Development.

18/500393/FULL Erection of a natural gas fuelled reserve power plant with a maximum export capacity of up to 12MW.

11.11.23 Natural England have recently provided a response to this application, requiring more information on the air quality impacts on the SPA and Ramsar sites prior to a decision being issued.

11.11.24 There are therefore potential impacts through cumulative changes to air quality. consideration of such effects is presented above. No other in-combination effects are considered likely.

SW/14/0224 – Application for a solar farm;

11.11.25 An application for a solar farm, on 38 hectares of arable farmland on the Tonge Corner Farm, near Sittingbourne, Kent.

11.11.26 Wintering bird surveys found that the arable fields provided occasional opportunities for curlew and golden plover. Redshank and Lapwing were also recorded within the arable land but in very low numbers and on only a small number of occasions. Other species associated with the nearby SPA and Ramsar site were recorded in adjacent habitats, in particular over the sheep grazed pasture to the north of the application area.

11.11.27 In order to ensure that no negative impacts occur on the SPA / Ramsar, all good-practise dust suppression measures were used during the construction phase of the development. Noise was not considered to be an issue, during either the construction or the operational phase. The increased ecological landscaping, aimed at providing habitat for wintering birds, will also increase the carrying capacity of the site.

11.11.28 Given this, the lack of impacts associated with any of these pathways identified above from the K3 Proposed Development and that all other developments on the site are slight and not considered to have any effect on The Swale.

SW/13/1495

11.11.29 Variation of condition 9 of planning permission SW/11/548, to increase the number of HGV movements from 58 to 98 (49 in and 49 out) for a period of 12 months. The application does not provide any additional details on whether this increase in vehicular movement will impact any of the nearby designated sites. However, the 12 months sought will not overlap with the construction period of the K3 Proposed Development. Therefore, no cumulative impacts are anticipated.

EN010090 (18/501923/ADJ) K4

11.11.30 There will be no overlap between the construction activity of the K3 Proposed Development and that of K4.

There are potential impacts through cumulative changes to air quality from K4 operating with the K3 Proposed Development which are considered above. No further in-combination effects are considered likely.

Practical effect of the Proposed Development + other cumulative developments

16/507687/COUNTY IBA Recycling Facility

11.11.31 A detailed consideration of these impacts is provided in the Ecology Statement that accompanied this planning application. The potential for cumulative effects with the original K3 permission was considered in the planning submission for the IBA. No such effects were identified. The combination of the IBA and K3 was considered acceptable with respect to the quantum of habitat to be created in the combined development. Given that this will not change when the practical effect of the K3 Proposed Development is considered, no cumulative effects are considered likely.

16/501484/COUNTY Gypsum Recycling Building

11.11.32 Various developments have been proposed or are being constructed at the Countrystyle Recycling Ltd. site 350 m to the north of the proposed development. The largest of these includes 16/501484/COUNTY - Gypsum Recycling Building for which the Habitats Regulations Assessment submitted [Ref 11.20] identified potential impacts from the development with respect to changes in water quality and disturbance of wintering birds during impact piling. The proposed mitigation to avoid such impacts included a detailed surface water management plan and the timing of piling works to occur between May and September.

11.11.33 Given this, the lack of impacts associated with either of these pathways identified above from the K3 Proposed Development, no in-combination effects are considered likely.

SW/11/1291 - Kemsley AD Plant (DS Smith Paper)

11.11.34 The proposed Kemsley AD Plant is located on the far side of the reedbed immediately to the north of the DCO boundary. It is currently being commissioned, having been constructed during 2017/2018. In-combination impacts to the Swale SPA/Ramsar could occur via cumulative changes to air quality which are considered above. No other in-combination impacts are considered likely.

14/500327/OUT New Offices

11.11.35 The proposed creation of up to 8,000 m^2 of new Class B1 and B2 floor space along with the extension of the Milton Creek Country Park 495 m to the south of the Proposed Development is in close proximity to The Swale SPA/SSSI/Ramsar. However, potential impacts associated with the development on these sites derive from an increased recreational use of the foreshore area by visitors to the Country Park. Since there are no such increases in recreational use associated with the proposed development, there are no overlapping pathways for effects to occur with the K3 Proposed Development; therefore, there are no in-combination effects.

14/502737/EIASCO and 16/506935/COUNTY – Works at Ridham Docks

11.11.36 Ridham Docks is 1.6 km to the north of the proposed development and comprises a range of industrial uses including a biomass incinerator (constructed), Materials Recycling Facility (MRF) and various storage facilities (including wood for the biomass incinerator). All of the current applications (submitted and not determined) relate to variations to existing permissions, none of which are considered likely to have an in-combination effect with the K3 Proposed Development.

SW/15/500348 – Construction of advanced thermal conversion and energy facility (4Evergreen Technologies Ltd.)

The proposed energy facility will pyroloyse refuse-derived fuel to generate syngas that can then be burnt to generate heat and, subsequently, electricity. The process of burning the syngas leads to the emission to air of a range of chemicals, similar to those emitted by the Proposed Development, the in-combination effect of which is described above. 17/505073/FULL Erection of a tile factory including service yard, storage yard and car parking area.

11.11.37 The application is for a new tile factory, along with a storage yard, car park and associated landscaping features. As part of the planning application, a suite of ecological surveys were undertaken, including reptile, GCN, bird, otter and water vole. The assessment also looked at impacts on the nearby designated sites, however, it was concluded that, given the site was already highly disturbed, that the slight increase in noise would not negatively impact the birds using the SPA/Ramsar, especially given the mitigation measures, such as the creation of a bund.

11.11.38 Therefore, no residual impacts remain that could result in in-combination impacts with the K3 Proposed Development.

18/500393/FULL Erection of a natural gas fuelled reserve power plant with a maximum export capacity of up to 12MW.

11.11.39 Natural England have recently provided a response to this application, requiring more information on the air quality impacts on the SPA and Ramsar sites prior to a decision being issued.

11.11.40 There are therefore potential impacts through cumulative changes to air quality which are considered above. No other in-combination effects are considered likely.

11.11.41

SW/14/0224 – Application for a solar farm;

11.11.42 An application for a solar farm, on 38 hectares of arable farmland on the Tonge Corner Farm, near Sittingbourne, Kent.

11.11.43 Wintering bird surveys found that the arable fields provided occasional opportunities for curlew and golden plover. Redshank and Lapwing were also recorded within the arable land but in very low numbers and on only a small number of occasions. Other species associated with the nearby SPA and Ramsar site were recorded in adjacent habitats, in particular over the sheep grazed pasture to the north of the application area.

11.11.44 In order to ensure that no negative impacts occur on the SPA / Ramsar, all good-practise dust suppression measures were used during the construction phase of the development. Noise was not considered to be an issue, during either the construction or the operational phase. The increased ecological landscaping, aimed at providing habitat for wintering birds, will also increase the carrying capacity of the site.

11.11.45 Given this, the lack of impacts associated with any of these pathways identified above from the K3 Proposed Development and that all other developments on the site are slight and not considered to have any effect on The Swale.

SW/13/1495

11.11.46 Variation of condition 9 of planning permission SW/11/548, to increase the number of HGV movements from 58 to 98 (49 in and 49 out) for a period of 12 months. The application does not provide any additional details on whether this increase in vehicular movement will impact any of the nearby designated sites. However, the 12 months sought will not overlap with the construction period of the K3 Proposed Development. Therefore, no cumulative impacts are anticipated.

EN010090 (18/501923/ADJ) K4

11.11.47 There will be no overlap between the construction activity of the K3 Proposed Development and that of K4.

There are potential impacts through cumulative changes to air quality from K4 operating with the K3 Proposed Development. These are described above. No other in-combination impacts are considered likely.

WKN Proposed Development + other relevant cumulative developments within the zone of influence of the development

16/507687/COUNTY IBA Recycling Facility

11.11.48 Given that the WKN Proposed Development is located on the same site as the permitted IBA facility, they are mutually exclusive; therefore, there can be no in combination effects between the IBA facility and the WKN Proposed Development.

16/501484/COUNTY Gypsum Recycling Building

11.11.49 Various developments have been proposed or are being constructed at the Countrystyle Recycling Ltd. site 350 m to the north of the proposed development. The largest of these includes 16/501484/COUNTY - Gypsum Recycling Building for which the Habitats Regulations Assessment submitted [Ref 11.19] identified potential impacts from the development with respect to changes in water quality and disturbance of wintering birds during impact piling. The proposed mitigation to avoid such impacts included a detailed surface water management plan and the timing of piling works to occur between May and September.

11.11.50 WKN Proposed Development is not anticipated to have any impact upon water quality, and the embedded mitigation measures to be included are eliminating the impacts upon wintering birds. Therefore, no in-combination effects are likely with the WKN Proposed Development.

SW/11/1291 - Kemsley AD Plant (DS Smith Paper)

11.11.51 The proposed Kemsley AD Plant is located on the far side of the reedbed immediately to the north of the WKN Site. It is currently being commissioned, having been constructed during 2017/2018. In-combination impacts to the Swale SPA/Ramsar could occur via cumulative changes to air quality. An assessment of these effects is provided above. No other in-combination effects are considered likely.

14/500327/OUT New Offices

11.11.52 The proposed creation of up to 8,000 m^2 of new Class B1 and B2 floor space along with the extension of the Milton Creek Country Park 495 m to the south of the Proposed Development is in close proximity to The Swale SPA/SSSI/Ramsar. However, potential impacts associated with the development on these sites derive from an increased recreational use of the foreshore area by visitors to the Country Park. Since there are no such increases in recreational use associated with the proposed development, there are no overlapping pathways for effects to occur with the WKN Proposed Development; therefore, there are no in-combination effects.

14/502737/EIASCO and 16/506935/COUNTY – Works at Ridham Docks

11.11.53 Ridham Docks is 1.6 km to the north of the proposed development and comprises a range of industrial uses including a biomass incinerator (constructed), Materials Recycling Facility (MRF) and various storage facilities (including wood for the biomass incinerator). All of the current applications (submitted and not determined) relate to variations to existing permissions, none of which are considered likely to have an in-combination effect with the WKN Proposed Development.

SW/15/500348 – Construction of advanced thermal conversion and energy facility (4Evergreen Technologies Ltd.)

The proposed energy facility will pyroloyse refuse-derived fuel to generate syngas that can then be burnt to generate heat and, subsequently, electricity. The process of burning the syngas leads to the emission to air of a range of chemicals, similar to those emitted by the Proposed Development. The in-combination effect of these is considered above. No other in-combination effects are considered likely.
17/505073/FULL Erection of a tile factory including service yard, storage yard and car parking area.

11.11.54 The application is for a new tile factory, along with a storage yard, car park and associated landscaping features. As part of the planning application, a suite of ecological surveys were undertaken, including reptile, GCN, bird, otter and water vole. The assessment also looked at impacts on the nearby designated sites, however, it was concluded that, given the site was already highly disturbed, that the slight increase in noise would not negatively impact the birds using the SPA/Ramsar, especially given the mitigation measures, such as the creation of a bund.

11.11.55 Therefore, no residual impacts remain that could result in in-combination impacts with the WKN Proposed Development.

18/500393/FULL Erection of a natural gas fuelled reserve power plant with a maximum export capacity of up to 12MW.

11.11.56 Natural England have recently provided a response to this application, requiring more information on the air quality impacts on the SPA and Ramsar sites prior to a decision being issued.

11.11.57 There are therefore potential impacts through cumulative changes to air quality. An assessment of such effects is provided above. No other in-combination effects are considered likely.

SW/14/0224 – Application for a solar farm

11.11.58 An application for a solar farm, on 38 hectares of arable farmland on the Tonge Corner Farm, near Sittingbourne, Kent.

11.11.59 Wintering bird surveys found that the arable fields provided occasional opportunities for curlew and golden plover. Redshank and Lapwing were also recorded within the arable land but in very low numbers and on only a small number of occasions. Other species associated with the nearby SPA and Ramsar site were recorded in adjacent habitats, in particular over the sheep grazed pasture to the north of the application area.

11.11.60 In order to ensure that no negative impacts occur on the SPA / Ramsar, all good-practise dust suppression measures were used during the construction phase of the development. Noise was not considered to be an issue, during either the construction or the operational phase. The increased ecological landscaping, aimed at providing habitat for wintering birds, will also increase the carrying capacity of the site.

11.11.61 Given this, the lack of impacts associated with any of these pathways identified above from the WKN Proposed Development and that all other developments on the site are slight and not considered to have any effect on The Swale.

SW/13/1495

11.11.62 Variation of condition 9 of planning permission SW/11/548, to increase the number of HGV movements from 58 to 98 (49 in and 49 out) for a period of 12 months. The application does not provide any additional details on whether this increase in vehicular movement will impact any of the nearby designated sites. However, the 12 months sought will not overlap with the construction period of WKN Proposed Development. Therefore, no cumulative impacts are anticipated.

EN010090 (18/501923/ADJ) K4

11.11.63 It is possible that the general construction activity within the WKN Proposed Development (in combination with K4) could further make the reedbed unattractive to Marsh Harrier. However, the existing mitigation for this (1 ha of new reedbed habitat in an appropriate location on the Isle of Sheppey to provide alternative breeding habitat during the development) would also provide sufficient mitigation for any further disturbance/urbanisation associated with the WKN Proposed Development in combination with K4.

11.11.64 There are also potential impacts through cumulative changes to air quality. Such effects are considered above. No other in-combination effects are considered likely.

WKN Proposed Development + K3 Proposed Development + other relevant cumulative developments within the zone of influence of the development

16/507687/COUNTY IBA Recycling Facility

11.11.65 Given that the IBA Facility and WKN Proposed Development are mutually exclusive (since they are located on the same site), there can be no cumulative effects when considering both the WKN Proposed Development and the K3 Proposed Development.

16/501484/COUNTY Gypsum Recycling Building

11.11.66 Various developments have been proposed or are being constructed at the Countrystyle Recycling Ltd. site 350 m to the north of the proposed development.

The largest of these includes 16/501484/COUNTY - Gypsum Recycling Building for which the Habitats Regulations Assessment submitted [Ref 11.19] identified potential impacts from the development with respect to changes in water quality and disturbance of wintering birds during impact piling. The proposed mitigation to avoid such impacts included a detailed surface water management plan and the timing of piling works to occur between May and September.

11.11.67 Given this, the lack of impacts associated with either of these pathways identified above from the K3 Proposed Development, no in-combination effects are considered likely.

11.11.68 WKN Proposed Development is not anticipated to have any impact upon water quality, and the embedded mitigation measures to be included are eliminating the impacts upon wintering birds. Therefore, no in-combination effects are likely with the WKN Proposed Development.

SW/11/1291 - Kemsley AD Plant (DS Smith Paper)

11.11.69 The proposed Kemsley AD Plant is located on the far side of the reedbed immediately to the north of the DCO boundary. It is currently being commissioned, having been constructed during 2017/2018. In-combination impacts to the Swale SPA/Ramsar could occur via cumulative changes to air quality. Such effects are considered above. No other in-combination effects are considered likely.

14/500327/OUT New Offices

11.11.70 The proposed creation of up to 8,000 m^2 of new Class B1 and B2 floor space along with the extension of the Milton Creek Country Park 495 m to the south of the Proposed Development is in close proximity to The Swale SPA/SSSI/Ramsar. However, potential impacts associated with the development on these sites derive from an increased recreational use of the foreshore area by visitors to the Country Park. Since there are no such increases in recreational use associated with the proposed development, there are no overlapping pathways for effects to occur cumulatively, with both WKN and K3 Proposed Developments; therefore, there are no in-combination effects.

14/502737/EIASCO and 16/506935/COUNTY – Works at Ridham Docks

11.11.71 Ridham Docks is 1.6 km to the north of the proposed development and comprises a range of industrial uses including a biomass incinerator (constructed), Materials Recycling Facility (MRF) and various storage facilities (including wood for the biomass incinerator). All of the current applications (submitted and not determined) relate to variations to existing permissions, none of which are considered likely to have an in-combination effect with the K3 and WKN Proposed Developments when considering both in-combination.

17/505073/FULL Erection of a tile factory including service yard, storage yard and car parking area.

11.11.72 The application is for a new tile factory, along with a storage yard, car park and associated landscaping features. As part of the planning application, a suite of

ecological surveys were undertaken, including reptile, GCN, bird, otter and water vole. The assessment also looked at impacts on the nearby designated sites, however, it was concluded that, given the site was already highly disturbed, that the slight increase in noise would not negatively impact the birds using the SPA/Ramsar, especially given the mitigation measures, such as the creation of a bund.

11.11.73 Therefore, no residual impacts remain that could result in in-combination impacts with both K3 / WKN Proposed Developments together.

15/500348/COUNTY | Install advance thermal conversion and energy facility at Kemsley Fields Business Park

11.11.74 To produce energy and heat, including construction of new buildings to house thermal conversion and energy generation plant and equipment; construction of associated offices; erection of external plant including storage tanks; and erection of discharge stack (KCC planning application KCC/SW/0010/2015 refers).

11.11.75 An air quality assessment was undertaken for the site (Environmental Compliance 2014), which found that the proposed development would not negatively impact The Swale SPA / Ramsar, as the nitrogen, sulphur dioxide and ammonia levels were not modelled to be above the critical loads.

11.11.76 In-combination impacts to the Swale SPA/Ramsar could occur via cumulative changes to air quality. Such effects are considered above. No other in-combination effects are considered likely.

18/500393/FULL Erection of a natural gas fuelled reserve power plant with a maximum export capacity of up to 12MW.

11.11.77 Natural England have recently provided a response to this application, requiring more information on the air quality impacts on the SPA and Ramsar sites prior to a decision being issued.

There are therefore potential impacts through cumulative changes to air quality. Such effects are considered above. No other in-combination effects are considered likely.

SW/14/0224 – Application for a solar farm;

11.11.78 An application for a solar farm, on 38 hectares of arable farmland on the Tonge Corner Farm, near Sittingbourne, Kent.

11.11.79 Wintering bird surveys found that the arable fields provided occasional opportunities for curlew and golden plover. Redshank and Lapwing were also recorded within the arable land but in very low numbers and on only a small number of occasions. Other species associated with the nearby SPA and Ramsar site were recorded in adjacent habitats, in particular over the sheep grazed pasture to the north of the application area.

11.11.80 In order to ensure that no negative impacts occur on the SPA / Ramsar, all good-practise dust suppression measures were used during the construction phase of the development. Noise was not considered to be an issue, during either the

construction or the operational phase. The increased ecological landscaping, aimed at providing habitat for wintering birds, will also increase the carrying capacity of the site.

11.11.81 Given this, the lack of impacts associated with any of these pathways identified above from the K3 Proposed Development and WKN Proposed Development in-combination and that all other developments on the site are slight and not considered to have any effect on The Swale.

SW/13/1495

11.11.82 Variation of condition 9 of planning permission SW/11/548, to increase the number of HGV movements from 58 to 98 (49 in and 49 out) for a period of 12 months. The application does not provide any additional details on whether this increase in vehicular movement will impact any of the nearby designated sites. However, the 12 months sought will not overlap with the construction period of either WKN or K3 Proposed Developments. Therefore, no cumulative impacts are anticipated.

EN010090 (18/501923/ADJ) K4

11.11.83 It is possible that the general construction activity within the WKN Proposed Development (in combination with K4) could further make the reedbed unattractive to Marsh Harrier. However, the existing mitigation for this (1 ha of new reedbed habitat in an appropriate location on the Isle of Sheppey to provide alternative breeding habitat during the development) would also provide sufficient mitigation for any further disturbance/urbanisation associated with the WKN Proposed Development in combination with K4.

11.11.84 There are potential impacts through cumulative changes to air quality. Such effects are considered above. No other in-combination effects are considered likely.

WKN Proposed Development + Practical effect of the K3 Proposed Development + other relevant cumulative developments within the zone of influence of the development

16/507687/COUNTY IBA Recycling Facility

11.11.85 Given that the IBA Facility and WKN Proposed Development are mutually exclusive (since they are located on the same site), there can be no cumulative effects when considering both the WKN Proposed Development and the K3 Proposed Development.

16/501484/COUNTY Gypsum Recycling Building

11.11.86 Various developments have been proposed or are being constructed at the Countrystyle Recycling Ltd. site 350 m to the north of the proposed development. The largest of these includes 16/501484/COUNTY - Gypsum Recycling Building for which the Habitats Regulations Assessment submitted [Ref 11.19] identified potential impacts from the development with respect to changes in water quality and disturbance of wintering birds during impact piling. The proposed mitigation

to avoid such impacts included a detailed surface water management plan and the timing of piling works to occur between May and September.

11.11.87 Given this, the lack of impacts associated with either of these pathways identified above from the K3 Proposed Development, no in-combination effects are considered likely.

11.11.88 WKN Proposed Development is not anticipated to have any impact upon water quality, and the embedded mitigation measures to be included are eliminating the impacts upon wintering birds. Therefore, no in-combination effects are likely with the WKN Proposed Development.

SW/11/1291 - Kemsley AD Plant (DS Smith Paper)

11.11.89 The proposed Kemsley AD Plant is located on the far side of the reedbed immediately to the north of the DCO boundary. It is currently being commissioned, having been constructed during 2017/2018. In-combination impacts to the Swale SPA/Ramsar could occur via cumulative changes to air quality. Such effects are considered above. No other in-combination effects are considered likely.

14/500327/OUT New Offices

11.11.90 The proposed creation of up to 8,000 m^2 of new Class B1 and B2 floor space along with the extension of the Milton Creek Country Park 495 m to the south of the Proposed Development is in close proximity to The Swale SPA/SSSI/Ramsar. However, potential impacts associated with the development on these sites derive from an increased recreational use of the foreshore area by visitors to the Country Park. Since there are no such increases in recreational use associated with the proposed development, there are no overlapping pathways for effects to occur cumulatively, with both WKN and K3 Proposed Developments; therefore, there are no in-combination effects.

14/502737/EIASCO and 16/506935/COUNTY – Works at Ridham Docks

11.11.91 Ridham Docks is 1.6 km to the north of the proposed development and comprises a range of industrial uses including a biomass incinerator (constructed), Materials Recycling Facility (MRF) and various storage facilities (including wood for the biomass incinerator). All of the current applications (submitted and not determined) relate to variations to existing permissions, none of which are considered likely to have an in-combination effect with the K3 and WKN Proposed Developments when considering both in-combination.

17/505073/FULL Erection of a tile factory including service yard, storage yard and car parking area.

11.11.92 The application is for a new tile factory, along with a storage yard, car park and associated landscaping features. As part of the planning application, a suite of ecological surveys were undertaken, including reptile, GCN, bird, otter and water vole. The assessment also looked at impacts on the nearby designated sites, however, it was concluded that, given the site was already highly disturbed, that the slight increase in noise would not negatively impact the birds using the SPA/Ramsar, especially given the mitigation measures, such as the creation of a bund.

11.11.93 Therefore, no residual impacts remain that could result in in-combination impacts with both K3 / WKN Proposed Developments together.

15/500348/COUNTY | Install advance thermal conversion and energy facility at Kemsley Fields Business Park

11.11.94 To produce energy and heat, including construction of new buildings to house thermal conversion and energy generation plant and equipment; construction of associated offices; erection of external plant including storage tanks; and erection of discharge stack (KCC planning application KCC/SW/0010/2015 refers).

11.11.95 An air quality assessment was undertaken for the site (Environmental Compliance 2014), which found that the proposed development would not negatively impact The Swale SPA / Ramsar, as the nitrogen, sulphur dioxide and ammonia levels were not modelled to be above the critical loads.

11.11.96 In-combination impacts to the Swale SPA/Ramsar could occur via cumulative changes to air quality. Such effects are considered above. No other in-combination effects are considered likely.

18/500393/FULL Erection of a natural gas fuelled reserve power plant with a maximum export capacity of up to 12MW.

11.11.97 Natural England have recently provided a response to this application, requiring more information on the air quality impacts on the SPA and Ramsar sites prior to a decision being issued.

11.11.98 There are therefore potential impacts through cumulative changes to air quality. Such effects are considered above. No other in-combination effects are considered likely.

SW/14/0224 – Application for a solar farm;

11.11.99 An application for a solar farm, on 38 hectares of arable farmland on the Tonge Corner Farm, near Sittingbourne, Kent.

11.11.100 Wintering bird surveys found that the arable fields provided occasional opportunities for curlew and golden plover. Redshank and Lapwing were also recorded within the arable land but in very low numbers and on only a small number of occasions. Other species associated with the nearby SPA and Ramsar site were recorded in adjacent habitats, in particular over the sheep grazed pasture to the north of the application area.

11.11.101 In order to ensure that no negative impacts occur on the SPA / Ramsar, all good-practise dust suppression measures were used during the construction phase of the development. Noise was not considered to be an issue, during either the construction or the operational phase. The increased ecological landscaping, aimed at providing habitat for wintering birds, will also increase the carrying capacity of the site.

11.11.102 Given this, the lack of impacts associated with any of these pathways identified above from the K3 Proposed Development and WKN Proposed

Development in-combination and that all other developments on the site are slight and not considered to have any effect on The Swale.

SW/13/1495

11.11.103 Variation of condition 9 of planning permission SW/11/548, to increase the number of HGV movements from 58 to 98 (49 in and 49 out) for a period of 12 months. The application does not provide any additional details on whether this increase in vehicular movement will impact any of the nearby designated sites. However, the 12 months sought will not overlap with the construction period of either WKN or K3 Proposed Developments. Therefore, no cumulative impacts are anticipated.

EN010090 (18/501923/ADJ) K4

11.11.104 It is possible that the general construction activity within the WKN Proposed Development (in combination with K4) could further make the reedbed unattractive to Marsh Harrier. However, the existing proposed mitigation for this (1 ha of new reedbed habitat in an appropriate location on the Isle of Sheppey to provide alternative breeding habitat during the development) would also provide sufficient mitigation for any further disturbance/urbanisation associated with the WKN Proposed Development in combination with K4.

11.11.105 There are potential impacts through cumulative changes to air quality. Such effects are considered above. No other in-combination effects are considered likely.

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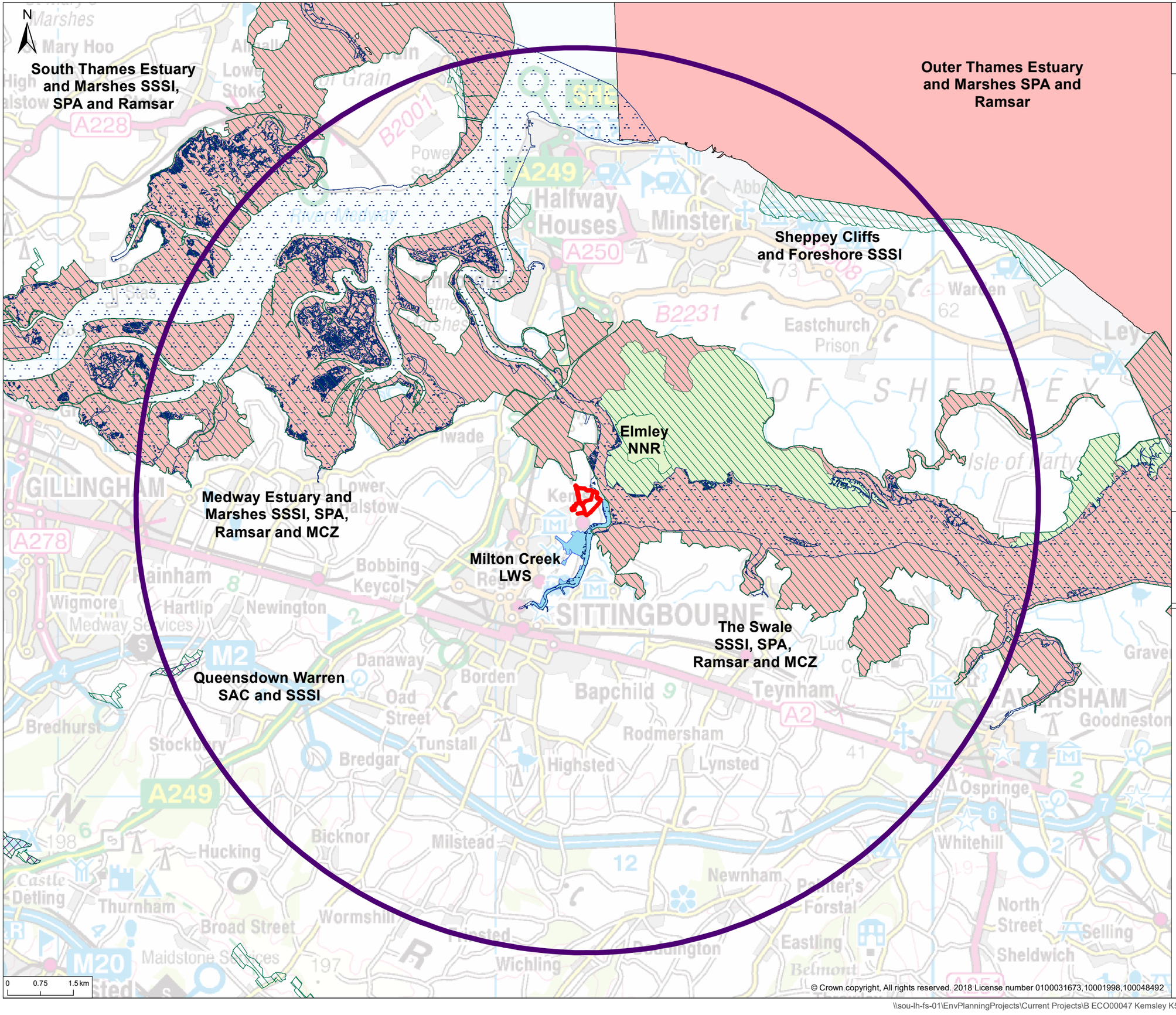

Legend

- Application boundary
- 10km radius
- SPA & Ramsar
- SAC
- SSSI
- MCZ
- LWS
- NNR

Notes
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Client	Wheelabrator Technologies Inc.
Project	K3 and WKN DCO
Title	Designated Sites Location Plan

Status	Drawn By:	PM/Checked By
FINAL	HK	NB
Job Ref	**Scale @ A3**	**Date Created**
ECO00047	1:82,131	AUG 2019

Figure Number
11.1

N

0 0.175 0.35 km

Legend

- Application boundary
- 2 km radius from site

Species

- Amphibian
- Bird
- Flora
- Mammal (common seal)
- Mammal (hedgehog)
- Mammal (stoat)
- Mammal (water shrew)
- Mammal (weasel)
- Reptile
- Water vole
- Maternity roost
- Bat roost
- Bat

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Client	Wheelabrator Technologies Inc.
Project	K3 and WKN DCO
Title	Protected Species Distributions

Status	Drawn By:	PM/Checked By
FINAL	HK	NB
Job Ref	**Scale @ A3**	**Date Created**
ECO00047	1:18,648	AUG 2019

Figure Number
11.2

\\sou-lh-fs-01\EnvPlanningProjects\Current Projects\B ECO00047 Kemsley K5\Tech\GIS\ECO00047_11.2 (Protected Species Distributions).mxd

Legend

- DCO Boundary
- Dense scrub
- Short perennial
- Hardstanding
- Neutral grassland
- Swamp
- Spoil pile
- Scattered scrub
- Tall Ruderal
- Not surveyed

Notes
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Client: Wheelabrator Technologies Inc.

Project: K3 and WKN DCO

Title: K3 Phase 1 Habitat Survey

Status	Drawn By:	PM/Checked By
SUBMISSION	CR	NB
Job Ref	**Scale @ A3**	**Date Created**
OXF9812	1:3,000	SEPT 2019

Figure Number
11.3

\\eur-mpfs-02\projects\9812 Kemsley Construction Phase\Tech\Drawings\9812-0062-004.mxd

\\eur-mpfs-02\projects\9812 Kemsley Construction Phase\Tech\Drawings\9812-0062-004.mxd

N

0 0.0275 0.055 km

Legend

Application boundary

dB LAmax

- <=30
- 30<=35
- 40<=45
- 35<=40
- 45<=50
- 50<=55
- 55<=60
- 60<=65
- 65<=70
- 70<=75
- 75<=80
- 85<

Notes
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Client: Wheelabrator Technologies Inc.

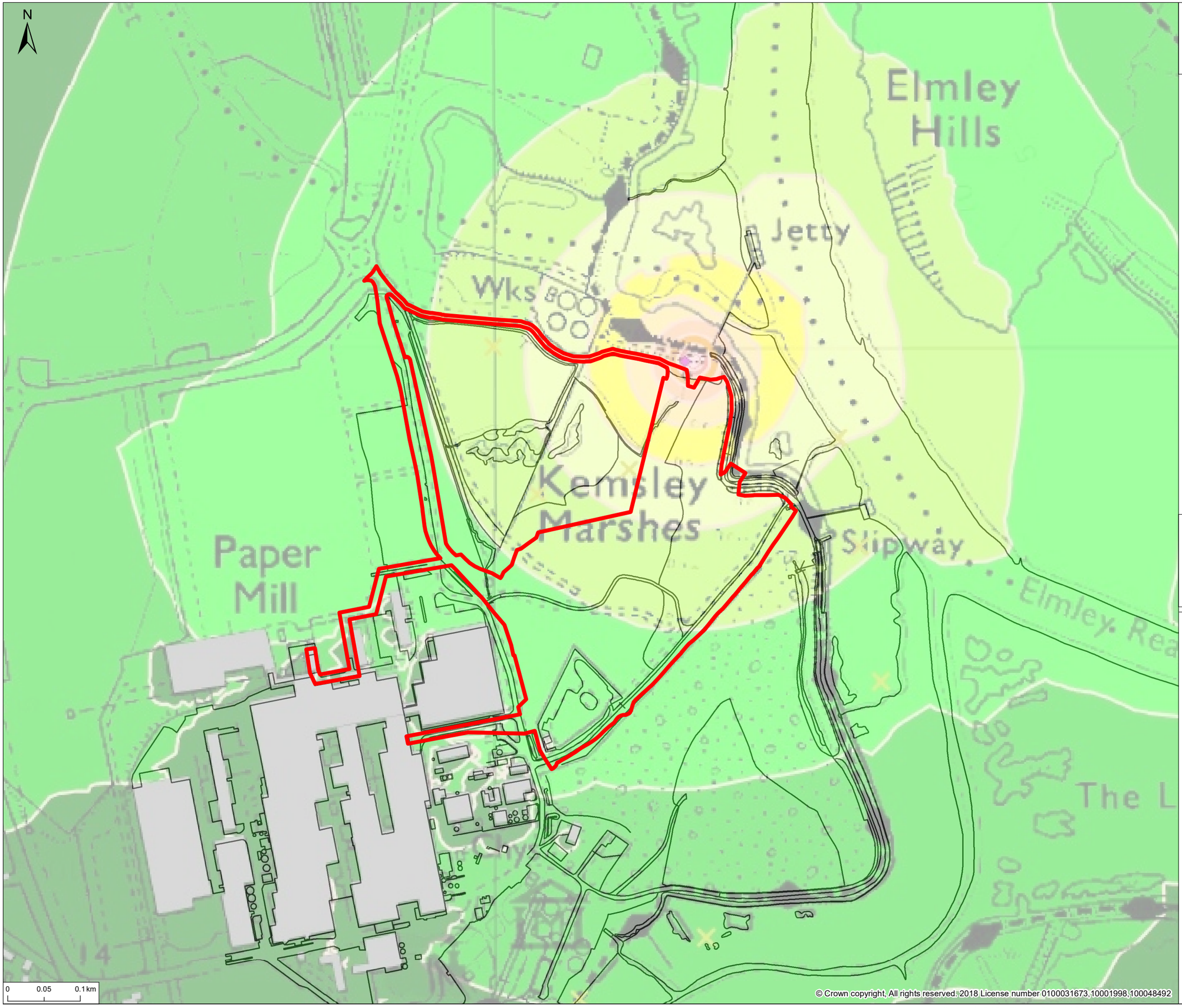
Project: K3 and WKN DCO

Title: Noise modelling - WKN Impact piling

Status	Drawn By:	PM/Checked By
FINAL	HK	NB
Job Ref	**Scale @ A3**	**Date Created**
ECO00047	1:3,000	AUG 2019

Figure Number
11.4

\\sou-lh-fs-01\EnvPlanningProjects\Current Projects\B ECO00047 Kemsley K5\Tech\GIS\ECO00047_Fig11.4 (Noise modelling - piling).mxd



REPORT TITLE

Legend

- Application boundary
- 85dB<
- 80<=85 dB
- 75<=80 dB
- 70<=75 dB
- 65<=70 dB
- 60<=65 dB
- 55<=60 dB
- 50<=55 dB
- 45<=50 dB
- 40<=45 dB
- 30<=35 dB
- 35<=40 dB
- <=30 dB

Notes
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Client: Wheelabrator Technologies Inc.

Project: K3 and WKN DCO

Title: WKN HGV - Noise modelling

Status	Drawn By:	PM/Checked By
FINAL	HK	NB
Job Ref	**Scale @ A3**	**Date Created**
ECO00047	1:5,000	AUG 2019

Figure Number
11.5

\\sou-lh-fs-01\EnvPlanningProjects\Current Projects\B ECO00047 Kemsley K5\Tech\GIS\ECO00047_Fig11.5 (HGV Noise modelling).mxd

\\sou-lh-fs-01\EnvPlanningProjects\Current Projects\B ECO00047 Kemsley K5\Tech\GIS\ECO00047_Fig11.5 (HGV Noise modelling).mxd

REPORT TITLE

Legend

- Application boundary
- Permanent habitat loss
- Loss of K3 landscaping
- Temporary habitat loss (re-instated post development)
- Re-instated habitat

Habitat	Area (ha)
Permanent loss	1.56
Temporary loss (re-instated)	0.9
Bare ground to be re-instated	0.52
Loss of K3 landscaping	0.59

0 0.0275 0.055 km

Notes
1. This drawing has been prepared in accordance with the scope of RPS's appointment with its client and is subject to the terms and conditions of that appointment. RPS accepts no liability for any use of this document other than by its client and only for the purposes for which it was prepared and provided.
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RPS

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Client: Wheelabrator Technologies Inc.

Project: K3 and WKN DCO

Title: Habitat Loss / Gain

Status	Drawn By:	PM/Checked By
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Figure Number
11.6

\\sou-lh-fs-01\EnvPlanningProjects\Current Projects\B ECO00047 Kemsley K5\Tech\GIS\ECO00047_Fig11.5a (Habitat Gain and Loss).mxd

\\sou-lh-fs-01\EnvPlanningProjects\Current Projects\B ECO00047 Kemsley K5\Tech\GIS\ECO00047_Fig11.5a (Habitat Gain and Loss).mxd