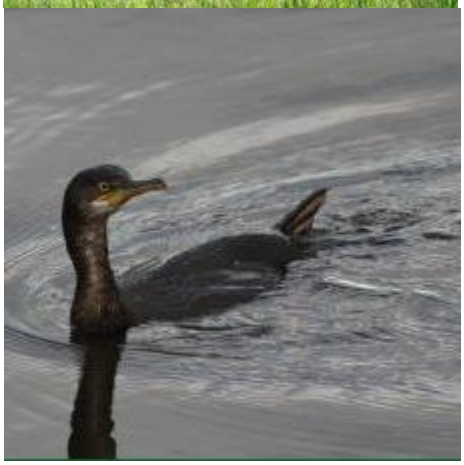

Ecological Impact Assessment

Smeed Dean Works

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This report is presented to Wienerberger in respect of the proposed development at the Smeed Dean Works, Sittingbourne and may not be used or relied on by any other person or by the client in relation to any other matters not covered specifically by the scope of this report. Notwithstanding anything to the contrary contained in the report, Ecosurv Ltd is obliged to exercise reasonable skill, care, and diligence in the performance of the services required by Wienerberger and Ecosurv Ltd shall not be liable except to the extent that it has failed to exercise reasonable skill, care and diligence, and this report shall be read and construed accordingly.

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Quality Assurance

All ecologists employed on this project by Ecosurv Ltd are members of the Chartered Institute of Ecology and Environmental Management (CIEEM) and follow the Institute's code of practice when undertaking ecological surveys and associated work, or were supervised by such a member.

All assessment is based upon, and accurate to, the information made available to Ecosurv Ltd prior to the completion of this report. Any alterations to this information at a later date will reduce the accuracy of this report, to which Ecosurv Ltd cannot be held accountable.

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1 EXECUTIVE SUMMARY

Ecosurv Ltd have been instructed to undertake a Ecological Impact Assessment (EcIA) at the proposed development around the Smeed Dean Works, Sittingbourne. The survey area comprised of 3 distinct areas, named *Tile factory, Ash stockpile* and *the Paddock.* Habitats across the three sites included Ephemeral/short perennial (J1.3), Poor semi-improved grassland (B6), Tall ruderal (C3.1), Shrub (A2), Earth bank (J2.8), Spoil (I12.2), Woodland (A1), Bare ground (J4).

The proposals are for a new concrete tile roof factory, which will include 3 new aluminium silos alongside a new loading route and primary service yard paved in concrete. The existing stockpile to the north will be enlarged. There will be a new paved road which will be a continuation of the existing as well as 42 additional parking spaces. A 2.1m tall post and mesh fence will be erected between the car parks and the road. The development of the site is 6.79 Hectares in size.

The EcIA has been completed in accordance with the CIEEM Guidelines for Ecological Impact Assessment the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2018). The EcIA comprised of a desktop study and a series of site visits. This included three Preliminary Ecological Appraisals completed in September 2021, which followed the CIEEM GPEA document (CIEEM, 2017) that includes: a standard Phase 1 habitat survey (JNCC, 2010); an assessment of the presence, or likely presence, of notable species; and an assessment of the value of habitats present on site.

In addition to the above and in order to identify likely impacts arising from the proposals, surveys have been undertaken for badgers *Meles meles*, otters *Lutra lutra*, water vole *Arvicola amphibius*, reptiles, wintering birds, great crested newt *Triturus cristatus* and breeding birds. These site visits were carried out in 2021/2022 by Douglas Kilpatrick MSc MA BSc (Hons) FGS.

The desktop study collated publicly available information on the biodiversity of the site and surrounding area, including the presence of any statutory and non-statutory sites. Biological records for a 3 km radius surrounding the site were also obtained from the Kent & Medway Biological Records Centre.

The site was considered to have low ecological value overall. Poorly developed ephemeral and ruderal species were present. However, areas of taller vegetation and long grasses provided suitable habitat for small vertebrates. And areas of woodland and shrub did have higher value, though often dominated by single species. The site is located adjacent to the Swale SSSI/ Ramsar/SPA. Furthermore, several UKBAP habitats are located on and adjacent to site.

Due to the absence of mature trees and significant shrub there is limited potential for nesting birds on site. No evidence of badger setts was found on site. The site is considered to have negligible potential to support roosting bats due to the absence of trees or suitable buildings on site. The site may provide only limited suitable foraging/commuting habitat for bats. Five ponds were located within 500 m of the site, the closest being 455 m north. A HSI of the pond indicated below average suitability for GCN, but the connecting terrestrial habitat was considered suitable. No records of GCN have been recorded on the site however there is some limited potential for GCN to be present. The long grasses and patchy vegetation were considered ideal reptile habitat, and high numbers of reptiles have been recorded.

Works should be timed to occur outside of overwintering bird season (October - February) to avoid impacting any overwintering birds within the Swale SSS/Ramsar/ SPA. Rabbit holes on site to be covered with one-way gates for

a period of 2 weeks, prior to the removal of bunds, in order to prevent live burial of mammals. To reduce the impact to other wildlife that may use the site, it is recommended that any trenches or voids are dug and filled within the same working day. Should this not be possible, an adequate means of escape should be provided and/ or the trench should be securely covered overnight. Compensatory planting of shrubs and small trees should be adopted within the final development. The improvement of any retained grassland areas, through wildflower seeding and appropriate management, should also be considered. The placement of a number of reptile hibernacula relative to the population size should be placed in the adjacent areas, in order to increase the population carrying capacity of the receptor site.

- The Swale is adjacent to site. This is a designated SPA, Ramsar and SSSI. No works are to infringe on the perimeter of the protected area without prior authorisation from Natural England.
- Reedbed, lowland mixed deciduous woodland, and Coastal and Floodplain Grazing Marsh (UKBAP) are located on or adjacent to site. Damage to perimeter vegetation will occur. Compensatory planting should be considered.
- Results of the 7-day reptile population surveys suggest that reptiles are present in high numbers on site and will significantly impacted. A 30-day translocation is recommended and mitigation habitat creation. Reptile exclusion fencing required
- The otter survey found no evidence of field signs around the Swale waterline. It is believed otters are absent from this site and therefor won't be impacted.
- The badger survey has found no evidence of setts within the site or within a 50 m buffer thereof. A single badger print was found north of site. It is not expected that badgers will be impacted by the development.
- Breeding bird surveys have not identified any birds making use of the *Paddock* area. A limited number of smaller birds make use of the site which will have a minor negative impact at a local level.
- Wintering bird surveys have identified several BoCC red list, Annex 1 and Schedule 1 that make use of the Swale (Ramsar, SSSI). Noise from the development and operations may disturb these species. None were observed on the footprint of the site. Increase height of screening hedges and bunds to reduce disturbance cues.
- No bat roosts have been identified on site. Presence of foraging and commuting bats was noted. Compensatory planting to create linear features. Increase insect recruitment to offset loss in suitable foraging habitat. Placement of bat boxes in the adjacent shrub and woodland to increase roosting potential around the site.
- The water vole survey found no evidence of field signs around the Swale waterline. It is believed water voles are absent from this site and therefor won't be impacted.
- No presence of hazel dormouse was noted.
- No presence of great crested newt was noted.
- Rabbit is present on site. Exclusion prior to rabbit hole destruction.
- Fox is present on site. No mitigation is required.

Ecological impacts arising from the development are presented in the table below alongside appropriate mitigation and compensation measures where applicable.

Table 1. EcIA Summary Table

Species/ Habitat	Impact	Magnitude	Mitigation/ Compensation	Significance of effects after mitigation
Badgers	None	Negligible	None	Negligible
Bats	• Change in commuting habitat • Possible loss in foraging habitat	Low	None	Low
Birds	• Loss of foraging habitat • Loss of nesting habitat • Noise disturbance • Visual disturbance • Clay dust • Vibrations from ongoing operations	Moderate	• Increase screening height. • Installation of bird boxes in neighbouring woodland and shrubland. • Vegetation clearance outside of nesting bird season. (March – August). Where this is not possible a suitably qualified Ecologist should make a check of the buildings and surrounding vegetation to identify the presence of any active nests.	Low
Great crested newt	• Loss of terrestrial habitat	Negligible	• Retention of a connecting habitat strip for dispersal.	Negligible
Reptiles	• Loss of habitat.	High	• Translocation of reptiles in the designated area. • Construction of hibernacula in receptor sites. • Retention of a connecting habitat strip for dispersal.	Moderate
Hazel Dormouse	None	Negligible	None	Negligible
Otter	None	Negligible	None	Negligible
Watervole	None	Negligible	None	Negligible
Rabbit	• Loss of foraging habitat • Loss of place of shelter	High	• Exclusion of rabbits from rabbit holes • ECoW present during development	Moderate
Fox	• Loss of foraging habitat • Loss of place of shelter	Low	None	Low

The Swale	• Dust • Vibrations	Moderate	• Dust suppression to be used where required to avoid degradation of surrounding habitat	Moderate
Reedbed	• Damage to perimeter vegetation	Low	• Enforce perimeter with markers • ECoW presence during construction • Compensatory planting • Increase buffer zone	Low
Coastal and Floodplain Grazing Marsh	• Reduction in habitat • Damage to perimeter vegetation during construction.	High	• Enforce perimeter with markers • ECoW presence during construction • Compensatory planting • Increase buffer zone	Moderate
Lowland mixed deciduous woodland	• Damage to perimeter vegetation during construction. • Reduction in habitat	Moderate	• Enforce perimeter with markers • ECoW presence during construction • Compensatory planting • Increase buffer zone • Tree root protection	Moderate (Damage to established trees persistent)

2 INTRODUCTION

2.1 Author

The survey work and preparation of this report has been undertaken by Douglas Kilpatrick MSc MA BSc (Hons) FGS.

This EcIA has been produced in accordance with the CIEEM Guidelines for Ecological Impact Assessment the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2018).

2.2 Report commissioned by

Ecosurv Ltd were instructed by Wienerberger Ltd. to complete a EcIA at the Smeed Dean Works, Sittingbourne.

2.3 Purpose

The aim of the study was to reasonably appraise the ecological value of the study area. The following objectives were set to achieve this aim:

- To identify potential ecological constraints to the proposed development;
- To identify the further ecological surveys needed to (inform an ecological impact assessment to be identified and appropriately designed) provide sufficiently robust data to the appropriate planning authority;
- To allow likely mitigation or compensation measures to be developed;
- To form a basis for agreeing the scope of the ecological impact assessment to be identified and appropriately designed;
- Complete a desk study of study area to gather information related to legally protected/ecologically important sites, habitats and/or species;
- Map all general habitats within the field survey area and identify any habitats that are ecologically important and/or have legal protection;
- Identify dominant species of vascular plants present within each mapped habitat type;
- Highlight any parts of the field survey area that support invasive plant species;
- Assess the potential of each identified habitat to support, and where possible also undertake initial preliminary field surveys for, any ecologically important and/or legally protected fauna species.

This information has then been used to identify potential ecological constraints to development and formulate reasonable ecological recommendations and define the future ecological scope of works.

To inform this report on potential ecological impacts regarding the proposed development at this site three PEA's conducted on site, including *The Tile Factory, The Paddock* and *The Ash Stockpile Area*. The PEA's comprised of desktop studies and site visits which were completed in October 2021 and followed the CIEEM GPEA document (CIEEM, 2017) that includes: a standard Phase 1 habitat survey (JNCC, 2010); an assessment of the presence, or likely presence, of notable species; and an assessment of the value of habitats present on site. Following the PEA badger, otter, reptile, breeding bird and wintering bird surveys were conducted.

2.4 Site name

Wienerberger Ltd., Smeed Dean Works, Swale Way, Sittingbourne, Kent, ME10 3TN.

2.5 Site description

The proposed development site comprised of three distinct areas, namely *The Tile Factory, The Paddock* and *The Ash Stockpile Area*. These areas consisted of bare ground, clay storage area, Ephemeral/short perennial (J1.3), Poor semi-improved grassland (B6) and tall ruderal (C3.1) and several storage depots/warehouses. The site is on the perimeter of an urbanised area, surrounded by a statutory protected area SPA, SAC, Ramsar and LWR

2.6 Project

The proposals are for a new concrete tile roof factory, which will include 3 new aluminium silos alongside a new loading route and primary service yard paved in concrete. The existing ramp into the existing brick factory will be removed to make way for the new building. The existing workshop and stock shed will also be demolished.

The site will include a new sand store, crushed concrete store, pallet store with 2.1m high brick surround/. A new raw materials storage area will also be created. There will be new large concrete tile stock areas in front of the factory and to the north of the site.

To the north of the site alongside the existing stockpile areas there will be a large stock pile area on unmade ground. Note this stockpile area will be kept separate from the green ecology area.

There will be a new paved road which will be a continuation of the existing road and allow lorries to drive further into the site. 30 parking spaces are proposed adjacent to the existing factory with a further 12 spaces adjacent to the proposed factory with 2.1m tall post and mesh fence between the car parks and the road.

The application is submitted in full and proposes the development of the site which is 6.79 Hectares in size. Approximately 4 Hectares of this is given over to hard landscaping, storage areas, a new car park and new proposed factory. The rest of the site is made up of unmade ground with stockpiles, grass and shrubbery. The proposed concrete tile brick factory is 5200m^2 and a 3400 m^2 tile drying area including 3 metal silos adjacent to the proposed factory.

Creation of a 1.5 m high flood attenuation bund along the perimeter is needed in accordance with requirements made by Natural England to protect the site from flooding and limit sediment runoff into the protected area.

2.7 Location

The site is centred on Grid Reference TQ 92403 65187 and can be accessed by the B2005 Swale Way (Figure 1).

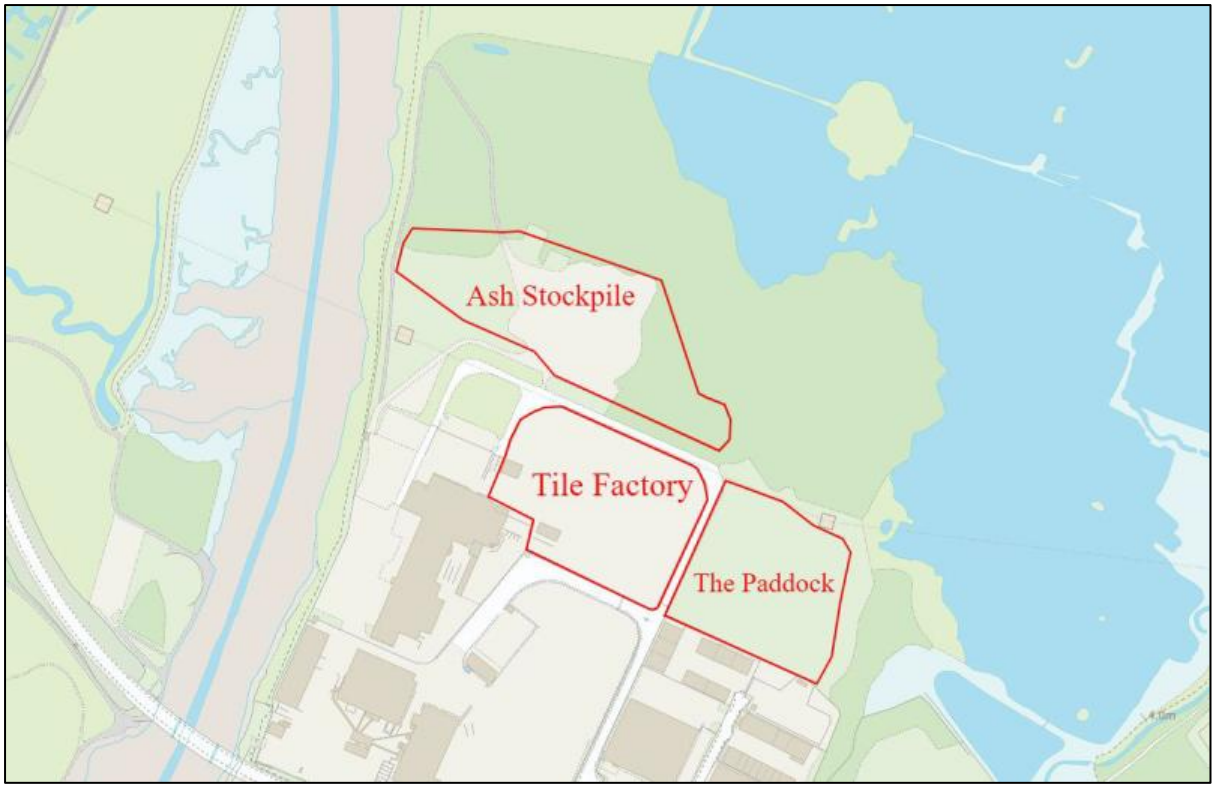

Figure 1. Site location plan. Red line shows the area proposed for development.
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3 LEGISLATION

3.1 Summary of legislation

This section summarises the legislation which is relevant, in ecological terms, to this assessment, i.e. legislation relevant to species present or potentially present within the survey area is included here along with legislation relevant to protected sites in the vicinity.

- Wildlife and Countryside Act 1981 (as amended);
- Countryside and Rights of Way (CROW) Act 2000;
- The Protection of Badgers Act (1992);
- Wild Mammals (Protection) Act 1996;
- The Conservation of Habitats and Species Regulations 2010 (as amended);
- Environment Act 1995;
- Natural Environment and Rural Communities (NERC) Act 2006.

The most significant legislation governing the protection of British wildlife is the Wildlife and Countryside Act 1981, the Countryside Rights of Way Act 2000 and The Conservation of Habitats and Species Regulations 2017. The Wildlife and Countryside Act, as amended mainly by the Countryside Rights of Way Act, protects animal species listed in Schedule 5 and plant species in Schedule 8 of the Act from being killed, injured, and used for trade. The provisions of this act further protect certain species, such as great crested newts and bats from being disturbed or taken from the wild, as well as protecting elements of their habitats. The Act also specifies that offences occur regardless of whether they were committed intentionally or recklessly. The parts of this legislation that apply to most reptile species are in regard to killing, injury and trade only and do not protect their habitat, nor are they protected from disturbance or from being taken from their habitat.

The Conservation of Habitats and Species Regulations is the English enactment of European legislation and provides similar but subtly different protection for species listed on Schedules 2 and 4 of those regulations. The provisions of this act complement those of the Wildlife and Countryside Act. Species to which these provisions apply are the European Protected Species. Activities that might cause offences to be committed can be legitimised by obtaining a licence from the relevant statutory body

The following EC Directives and international conventions are applied by some of the above UK Acts and Regulations:

- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and wild fauna and flora (as amended);
- Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds (as amended);
- Convention on the Conservation of European Wildlife and Natural Habitats (the Bern Convention) (1979) (as amended);
- Convention on the Conservation of Migratory Species of Wild Animals (the Bonn Convention) (1979) (as amended);
- Agreement on the Conservation of Bats in Europe (1999) (as amended).
- Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds

3.2 National Planning Policy

The National Planning Policy Framework (NPPF) published in 2012 and revised in July 2021 states that policy should promote the preservation, restoration and recreation of priority habitats, ecological networks and the protection and recovery of priority species populations linked to national and local targets.

The planning system should contribute to and enhance the natural environment by;

- Protecting and enhancing valued landscapes, geological conservation interests and soils;
- Recognise the wider benefits of ecosystem services;
- Minimising impacts on and providing net gains for biodiversity, contributing to the Government's commitment to halt the overall decline in biodiversity, included by establishing coherent ecological networks that are more resilient to current and future pressures.

The NPPF also states that planning for biodiversity should be done at a landscape scale across local authority boundaries, identifying components of the local ecological network including nationally and locally important sites for biodiversity and wildlife corridors and stepping stones that connect them.

Of particular significance with the revised NPPF is the amendment to para 175(d) of the NPPF 2019 (now para 180(d) of the NPPF 2021 – see below) – it now requires opportunities to incorporate biodiversity improvements in and around development, rather than simply making it optional. This demonstrates further steps taken by the government towards achieving the 25 Year Environment Plan (2018).

175. When determining planning applications, local planning authorities should apply the following principles:

a) 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;

b) 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;

c) 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

d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate.

Further details on the legislation protecting species of British wildlife and habitats relevant to this assessment can be found in the Appendices of this report.

3..2.1 Kent Minerals and Waste Local Plan July 2016 Policy DM2

Proposals for minerals and/or waste development will be required to ensure that there is no unacceptable adverse impact on the integrity, character, appearance and function, biodiversity interests, or geological interests of sites of international, national and local importance.

International Sites

Minerals and/or waste proposals located within or considered likely to have any unacceptable adverse impact on international designated sites, including Ramsar, Special Protection Areas and Special Areas of Conservation (European Sites), will need to be evaluated in combination with other projects and plans. Before any such proposal will be granted planning permission or identified in the Minerals and Waste Sites Plans, it will need to be demonstrated that:

- There are no alternatives
- There is a robust case established as to why there are imperative reasons of overriding public interest
- There is sufficient provision for adequate timely compensation

National Sites

Proposals for minerals and/or waste developments within or outside of designated Sites of Special Scientific Interest, that are considered likely to have any unacceptable adverse impact on a Site of Special Scientific Interest, will not be granted planning permission or identified in the Minerals and Waste Sites Plans except in exceptional circumstances where it can be demonstrated that:

a. The benefits of the development outweigh any impacts that it is likely to have on the features of the site that make it of special scientific interest

b. The benefits of the development outweigh any impacts that it is likely to have on the national network of Sites of Special Scientific Interest.

Local Sites

Minerals and/or waste proposals within the Local Sites listed below will not be granted planning permission, or identified in the Minerals and Sites Plans, unless it can be demonstrated that there is an overriding need for the development and any impacts can be mitigated or compensated for, such that there is a net planning benefit:

a. Local Wildlife Sites

b. Local Nature Reserves

c. Priority Habitats and Species

d. Land that is of regional or local importance as a wildlife corridor or for the conservation of biodiversity

e. Local Geological Sites

f. Irreplaceable habitat including aged and veteran trees

g. Country Parks, common land and village greens and other important areas of open space or green areas within built-up areas

3.2.2 Policy DM3

Ecological Impact Assessment

Proposals for minerals and waste developments will be required to ensure that they result in no unacceptable adverse impacts on Kent's important biodiversity assets. These include internationally, nationally and locally designated sites, European and nationally protected species, and habitats and species of principal importance for the conservation of biodiversity / Biodiversity Action Plan habitats and species.

Proposals that are likely to have unacceptable adverse impacts upon important biodiversity assets will need to demonstrate that an adequate level of ecological assessment has been undertaken and will only be granted planning permission following:

1. An ecological assessment of the site, including preliminary ecological appraisal and, where likely presence is identified, specific protected species surveys

2. Consideration of the need for, and benefits of, the development and the reasons for locating the development in its proposed location

3. The identification and securing of measures to mitigate any adverse impacts (direct, indirect and cumulative)

4. The identification and securing of compensatory measures where adverse impacts cannot be avoided or mitigated for

5. The identification and securing of opportunities to make a positive contribution to the protection, enhancement, creation and management of biodiversity

4 METHODS

4.1 Overview

EcIA is a process of identifying, quantifying, and evaluating potential effects of development-related or other proposed actions on habitats, species, and ecosystems. The findings of an assessment assist the competent authorities understand ecological issues when determining applications for consent.

The overall aims of the EcIA are to:

- Determine the importance of ecological features affected, through survey and/or research and with reference to available contextual information;
- Assess impacts potentially affecting important features;
- Characterise the impacts, e.g. extent, magnitude, duration, reversibility, timing, and frequency;
- Identify cumulative impacts;
- Identify significant effects of impacts in the absence of any mitigation.

The EcIA has used a number of data sources, including a desktop study and a series of site visits and reports, which are summarised in the table below.

Table 2. Summary of Survey Effort Undertaken to inform the EcIA

Surveys	Surveyors	Date of Completion
Preliminary Ecological Appraisal – The Paddock	Douglas Kilpatrick	16th September 2021
Preliminary Ecological Appraisal – Tile Factory	Douglas Kilpatrick	15th October 2021
Preliminary Ecological Appraisal – Ash Stockpile Area	Douglas Kilpatrick	16th September 2021
Wintering Bird Surveys	Douglas Kilpatrick	17th December 2021
	Graham Jeffery	24th January 2022
	Scott Taylor	24th February 2022
	Douglas Kilpatrick	29th March 2022
Breeding Bird Surveys	Douglas Kilpatrick	21st September 2021
	Douglas Kilpatrick	8th April 2022
	Douglas Kilpatrick	13th April 2022
	Douglas Kilpatrick	21st April 2022

	Douglas Kilpatrick	6th May 2022
	Douglas Kilpatrick	12th May 2022
Reptile Surveys	Douglas Kilpatrick	7th of April 2022
	Douglas Kilpatrick	13th April 2022
	Douglas Kilpatrick	21st April 2022
	Douglas Kilpatrick	6th May 2022
	Douglas Kilpatrick	12th May 2022
	Douglas Kilpatrick	26th May 2022
	Douglas Kilpatrick	1st June 2022
	Douglas Kilpatrick	22nd of June 2022
Badger Survey	Douglas Kilpatrick	22nd June 2022
Otter Survey	Douglas Kilpatrick	5th September 2022
Water Vole Survey	Douglas Kilpatrick	5th September 2022

All survey and assessment work has been completed in line with official guidelines produced by Natural England and the Chartered Institute for Ecology and Environmental Management, and British Standard document BS 42020: 2013 '*Biodiversity – Code of practice for planning and development.*'

4.2 Limitations

4.2.1 Desk study limitations

Species specific groups, such as Kent Bat Group, Kent Barn Owl Group, were not contacted for their detailed records within the survey area. However, the combination of data obtained was felt to be sufficient to carry out the objectives of the report.

4.2.2 Field Survey Limitations

Due to the time of year in which the vegetation surveys were carried out some floral species are likely to have been missed, as most floral species are more readily identifiable during spring or summer. Additional species would undoubtedly be recorded at different times of the year due to the variety of flowering strategies.

In addition, sections of the Swale were not surveyed for Otter or Water vole due to dense foliage.

4.3 Survey Area

The application site is located at Grid Reference TQ 92403 65187 and can be accessed via the B2005 Swale Way. The assessment focused on the application site, as well as all habitats in the immediate surrounding area (where access was available).

Figure 2. Satellite view of the site.
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4.4 Desktop Study

The desktop study collected publicly available information regarding the biodiversity of the area, including the habitat structure of the site and wider landscape, as well as the presence of any statutory or non-statutory designated sites, using the Multi-Agency Geographic Information for the Countryside (MAGIC) resource. Biological records within 3 km of the site were also requested from the Kent & Medway Biological Records Centre which included records of protected and notable species and any nearby non-statutory designated sites not available through MAGIC.

The Kent and Medway Biological records Centre were contacted for details of protected species and sites within the area of the proposed development.

Records from this source incorporated the following data:

- Kent & Medway Biological Records Centre https://www.kmbrc.org.uk/
- MAGIC Maps http://magic.defra.gov.uk/magicmap.aspx
- NBN National Biodiversity Records Gateway https://data.nbn.org.uk/
- Ordnance Survey https://osmaps.ordnancesurvey.co.uk/osmaps/

4.5 PEA Field surveys

Three PEA's were undertaken at Smeed Dean, namely the *Tile Factory*, *Ash Stockpile*, and *The Paddock*. The field surveys followed the CIEEM GPEA document (CIEEM, 2013) and BS 42020:2013 document (BSI, 2013). The PEA's were carried out by Douglas Kilpatrick MSc MA BSc (Hons) FGS on the 16th September 2021 and 15th October 2021. The survey areas included the site and extended into areas which were deemed to be a potential receptor of ecological impact due to the proposed development.

Habitats found on the site were identified using the standard Phase 1 Habitat Survey methodology (JNCC 2010) with target notes made to describe features of interest.

In addition to mapping habitat types and dominant flora, the potential for the survey area to support any legally protected faunal species and/or faunal species of nature conservation importance, e.g., BAP priority species, was assessed. Detailed surveys were not undertaken; rather the potential for the survey area to support each species/species group was assessed.

Features that would likely support protected species, holes in trees, drainage ditches, ponds, embankments etc. were all examined for the possible presence of species known to utilise these features, in accordance with the methodologies outlined in section 4.5. In addition, field signs or sightings of such species were recorded as seen.

Key features identified during the survey are summarised in the form of Target Notes. Nomenclature for plant species names is taken from Stace (2019) and the Botanical Society of the British Isles (BSBI) plant checklist (2007).

4.6 Protected Species Surveys

Based on the habitats present, the site was assessed with particular regard to determine the presence or otherwise of badgers (*Meles meles*), bats, great crested newts (GCN) (*Triturus cristatus*), nesting birds, wintering birds, otters, water voles, dormice and reptiles. An overview of the survey methods used is outlined below.

4.6.1 Badgers:

An assessment of the site and surrounding habitats (where access was available), with particular focus on any areas of dense vegetation, was carried out in order to identify any evidence of badgers, including:

- the presence of any setts
- well-used runs/tracks
- supplementary evidence, such as hairs or prints
- badgers themselves

4.6.2 Bats

Buildings and trees were assessed to identify potential roost features (PRFs) for bats, and/or observe evidence of roosting bats, in accordance with the current Bat Conservation Trust (BCT) survey guidelines (Collins, 2016) and Bat Mitigation Guidelines (Mitchell-Jones, 2014). The BCT guidelines detailed in Table 1 and criteria outlined in the Bat Mitigation Guidelines, are presented below.

The likelihood of bat roosts being present will be higher where structures:

- are of a pre-20th Century construction;
- are in a lowland rural setting;
- have woodland, mature trees, species-rich grassland and/or water nearby;
- have large dimension roof timbers with cracks, joints and holes;
- have numerous crevices in stonework and structures;
- have an uneven roof covering with gaps, though not too draughty;
- have hanging tiles or roof cladding, especially on south-facing walls;
- have a roof warmed by the sun;
- are disused or little used; largely undisturbed; or
- provide appropriate hibernation conditions, such as abandoned mines, tunnels, kilns, or fortifications;
- recent or historical records of bats on the site, or bat roosts in the general area.

The likelihood of bat roosts being present will be lower where structures:

- are in an urban setting with little green space;
- are subject to heavy disturbance;
- have a small, cluttered roof void (particularly for brown long-eared);
- are of a modern construction with few gaps or crevices that bats can fly or crawl through (though pipistrelle bats may still be present);
- are comprised of prefabricated steel or sheet materials;

- are active industrial premises; Please note that the above list provides generic screening criteria only and there are exceptions to consider. For example, pipistrelle breeding roost sites are often found in modern housing estates and therefore the absence of bats from such locations should not always be assumed.

Table 3. Guidelines for assessing bat roosting potential of structures and trees.

Suitability	Habitat description	Further action required?
Negligible	Negligible habitat features on site likely to be used by roosting bats.	No further bat risk assessment effort or bat activity surveys are required.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e., unlikely to be suitable for maternity or hibernation).	Structures: One bat activity survey is required to determine whether the structure is being utilised by roosting bats; this may be a dusk or dawn survey. This survey must occur between May and August. The discovery of a roosting bat during this single bat activity survey will require further survey effort.
	A tree of sufficient size and age to contain PRFs, but with none seen from the ground or features seen with only very limited roosting potential.	Trees: No further bat risk assessment effort or bat activity surveys are required.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection conditions and surrounding habitat, but unlikely to support a roost of high conservation status.	Two bat activity surveys are required to determine whether the structure or tree is being utilised by roosting bats; this should be comprised of one dusk and one dawn survey. One survey must occur between May and August.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.	Three bat activity surveys are required to determine whether the structure or tree is being utilised by roosting bats; this should be comprised of one dusk and one dawn survey, with an additional survey (either dusk or dawn). Two surveys must occur between May and August.

Evidence of roosting bats can include: bat droppings; staining around access points; small scratches around an entrance hole; audible squeaking at dusk or in warm weather; smoothening of surfaces around cavity or an entrance hole; distinctive smell of bats.

The bat risk assessment was completed using ladders, binoculars and a powerful torch

.

4.6.3 Great Crested Newts

The habitats on site were assessed in regards to their suitability to support GCN. Potential refugia (such as logs, stones, discarded building materials etc.) present were also checked for the presence of GCN.

Any ponds on-site or within 500m of the site boundaries (where access was available) were assessed for their habitat suitability for GCN, utilising the modified Great Crested Newt Habitat Suitability Index (ARG UK 2010; Oldham et al. 2000). The Habitat Suitability Index (HSI) is used to evaluate the suitability of ponds to support GCN. It is a numerical index between 0 and 1, where 0 indicates completely unsuitable habitat and 1 represents optimal habitat. The HSI score is then utilised to define the suitability of the pond on a categorical scale. This system provides an indication as to the suitability of ponds to support GCN but is not precise enough to conclude that a pond with a high score will definitely support GCN, whilst those with a low score will definitely not.

An HSI assessment was completed for TQ92426587. The results of the HSI assessment are discussed within Section 5.3 of this report, with the calculation of the HSI score for the pond provided within the Appendices.

4.6.4 Nesting Birds

The habitats on site were assessed to determine their suitability for nesting, with a check carried out for the presence of any active nests or any evidence of nesting behaviour.

4.6.5 Reptiles

The site was also assessed in regards to its suitability to support reptiles, which is largely based on an assessment of the habitats present on site and whether they afford sufficient opportunities to support basking, foraging and sheltering. Any refugia present was also checked for the presence of reptiles or evidence of reptiles, such as sloughs (shed skins).

4.6.6 Hazel Dormouse

An assessment of the site was carried out to determine the suitability for dormice in terms of vegetation structure and species composition, along with identifying any evidence of dormice presence, such as characteristically chewed hazel nuts, dormice nests or dormice themselves.

4.6.7 Wintering Birds

As per request by Natural England, wintering bird surveys were conducted in and around the site. A set of 4 wintering bird surveys was conducted around the site. These consist of a monthly visit during the months of December, January, February and March. These were conducted on the 17th of December 2021, January 2022, February 2022, and 27th of March 2022.It included fixed point observations of 30 min each, noting species and frequency Surveys were to be completed before 11 am. Binoculars, recording equipment and cameras were used. Tidal variations were noted to assess bird movement to and from the estuary during high and low tides.

A 1 km circuit was walked, and 4 fixed observation points were chosen. These points gave vantage over the

1) Estuary, wetland across, and shrubland to the east.

2) The Swale, woodland to the south and unmanaged grassland to the north.

3) The Paddock, the Swale and shrub to the north.

4) The Ash Stockpile.

Figure 4: Designated walking route with observation points 1, 2 and 3. Route is walked clockwise.
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4.6.8 Otter

Due to the proximity of a waterbody the banks of the Swale were surveyed for field signs or activity. Habitat that was considered to be suitable for supporting otter was surveyed for signs of this species using the standard survey method described by the former National Rivers Authority (NRA, 1993).

This involved searching for signs of otter presence, such as spraint (i.e., droppings), tracks, trails, footprints etc. The habitat was also evaluated to see if potential or confirmed otter holts or “couches", i.e., resting places, were present.

The approach used for this survey was the same as that adopted for the water vole survey. Survey points were located, on average, at least one every 10 m with at least a 5 m section of both banks being surveyed at each spot sampling point. As previously noted, survey point selection was often dictated by the density of the riparian vegetation, the steepness of the banks and the depth of the water but, where possible, the watercourses were surveyed from within the channel.

Otters are often quite predictable in the way that they leave territorial markers and other signs, and for this reason during the survey all potential sprainting sites, such as boulders, vegetation tussocks, large woody debris, bridge footings etc. were thoroughly examined. Any signs observed during the survey were recorded on a map.

4.6.9 Water vole

Habitat that was considered to be suitable for supporting water vole was surveyed for signs of this species using an adapted version of the method described in the Water Vole Conservation Handbook (Strachan & Moorhouse, 2006). This involved spot sampling the watercourses located within and adjacent to the site. Survey points were located, on average, at least one every 10m with at least a 5m section of both banks being surveyed at each spot sampling point. Survey point selection was often dictated by the density of the riparian vegetation, the steepness of the banks and the depth of the water. Where possible the watercourse was surveyed from within the channel.

At each survey point the habitat was examined for signs of water vole activity, such as burrows, droppings, latrines, tracks, trails, footprints, grazing lawns and chopped vegetation. Close- focussing binoculars were used to examine the opposite bank of watercourses where direct access was not possible. Any observations of water voles were also recorded. Any signs observed during the survey were recorded on a map and a note made of the grid reference.

4.6.10 Other Wildlife

In accordance with good practice, the site was checked for the presence of any other protected/notable species, with particular regard to any other species highlighted in the desktop study.

4.6.11 Invasive Species:

The site was also surveyed for the presence of any invasive, non-native flora or fauna.

4.7 Assessment methodology Biodiversity value

The CIEEM Guidelines

These guidelines provide a framework criterion for determining the value and importance of each potential ecological receptor found within the survey area.

Various characteristics can be used to identify important biodiversity features (sites, habitats, and species) that are likely to represent potentially significant constraints to the development project. These include a feature's:

- Rarity at various geographical scales;
- Threat status and vulnerability at various geographical scales;
- Diversity and/or its synergistic associations;
- Population size, and;
- Location in relation to its' known geographical distribution and range at various geographical scales.

The characteristics listed above help define a features' conservation status which can then be used to help determine its biodiversity value. CIEEM (2006) provides further information on how the relative value and importance of a receptor can be determined and states that its biodiversity value should be measured against published selection criteria where available.

It is also useful to distinguish between the biodiversity value of a receptor and its legal status. Features of high biodiversity value may not necessarily attract legal protection and vice versa. For example, a viable area of ancient woodland is likely to be considered of high biodiversity value even if it does not receive any formal statutory designations.

In the evaluation of biodiversity value, reference is also made to HA, UK and Local BAPs, inclusion on national or county Red Data Books, and to conservation status (such as nationally notable/scarce, etc.). However, the inclusion within a BAP reflects the fact that the population of the species/habitat concerned is in a sub-optimal state (and hence that conservation action is required) and does not necessarily imply any specific level of value. Despite this, priority BAP species/habitats may represent a significant ecological constraint if their presence triggers planning guidance implications (as outlined above).

In accordance with CIEEM (2006), each biodiversity feature should be assessed as valuable, or potentially valuable, based on the following geographic frame of reference (some examples of ecological receptors that may be potentially valuable at each geographical scale are provided below):

- International e.g. biodiversity feature that warrant designation of an area as a SPA, SAC, or Ramsar site;
- National (i.e. UK), e.g. biodiversity feature that warrants designation of an area as a SSSI;
- Regional, e.g. biodiversity features valuable at a regional level e.g. South East England;
- County, e.g. biodiversity features valuable at a county (i.e. Kent) level;
- District, e.g. biodiversity features of value at the district (i.e. Sittingbourne) level;
- Local, e.g. biodiversity features of value in a local (i.e. parish or within ~5km of the scheme extent) context;
- Biodiversity features of value within the immediate survey area of the scheme only.
- Local, e.g. species populations of value in a local (i.e. within ~5km of the scheme extent) context;
- Species of value within the immediate survey area of the scheme only.

5 RESULTS

5.1 Desktop Study

5.1.1 Statutory Protected Sites

There are 4 statutory sites within 2 km of the proposed development. 3 statutory sites are directly adjacent to site. The Swale SSSI, SPA, Ramsar, is a wetland of international importance, comprising intertidal mudflats, shell beaches, saltmarshes and extensive grazing marshes. It provides habitats for important assemblages of wintering waterfowl and also supports notable breeding bird population.

The proposed development area includes Coastal and Floodplain Grazing Marsh (UKBAP), Reedbeds (UKBAP), and Deciduous Woodland (UKBAP) some of which may be considered essential for the continued preservation of the statutory site. Due to the proximity of the works damage to perimeter vegetation can occur. Potential for root damage due to heavy construction vehicles, construction materials or construction of flood attenuation bunds is possible.

Disturbance, especially to wading or wintering birds can occur through noise, visual cues, vibrations from tracked vehicles or piling.

Because no reduction in the relevant habitat type will occur, it is believed no significant impact will arise from the development. No works are to be conducted during the overwintering season or during bird breeding season, therefore no direct impact to the overwintering birds will take place. In addition, the proposed development of the Paddock and Ash Stockpile is limited to clay storage with no building works occurring.

Elmley National Nature Reserve is located 1.5 km north and is home to large numbers of wintering wildfowl as well as breeding waders. This wide expanse of grazing marsh, divided by ditches and frequent shallow surface flooding, is at or below sea level.

The Medway estuary and marshes is located 3.9 km from site. Due to the distance from site, and the absence of direct connecting habitat, it is believed no direct impacts will occur. No changes in foraging habitat will occur as the relevant habitats will remain intact.

A summary of the sites is provided in table 2 below, with their location presented on the map in figure 3.

Table 4. Summary of Surrounding Statutory Protected Sites

Name	Features	Distance	Impact
Sites of Special Scientific Interest (SSSI's)			
THE SWALE	The Swale includes the largest remaining areas of freshwater grazing marsh in Kent and is representative of the estuarine habitats found on the north Kent coast. The habitats comprise chiefly mudflats, saltmarsh, and freshwater grazing marsh, the latter being intersected by extensive dykes and fleets. The area is particularly notable for the internationally important	Adjacent	• Construction Noise. • Operational Noise. • Vibrations. • Visual Disturbance. • Clay Dust. • Damage to Perimeter Vegetation.

	numbers of wintering and passage wildfowl and waders, and there are also important breeding populations of a number of bird species. Associated with the various constituent habitats of the site are outstanding assemblages of plants and invertebrates.		
MEDWAY ESTUARY AND MARSHES	The Medway Estuary and Marshes form the largest area of intertidal habitats which have been identified as of value for nature conservation in Kent and are representative of the estuarine habitats found on the North Kent coast. A complex of mudflats and saltmarsh is present with in places grazing marsh behind the sea walls which is intersected by dykes and fleets. The area holds internationally important populations of wintering and passage birds and is also of importance for its breeding birds. An outstanding assemblage of plant species also occurs on the site.	3.9 km NW	None.
Special Protection Areas (SPAs)			
THE SWALE	The Swale comprises extensive intertidal mudflats that encompass the entire northern and southern shores of the estuary extending from Ferry Marshes in the west down to Whitstable on the southern shore and Leysdown-on-Sea on the northern shore. The SPA also contains the largest expanse of grazing marsh in Kent (although is much reduced from its previous extent), which provide important feeding and roosting grounds for many waterbirds.	Adjacent	• Construction Noise. • Operational Noise. • Vibrations. • Visual Disturbance. • Clay Dust. • Damage to Perimeter Vegetation.
MEDWAY ESTUARY AND MARSHES	The Medway Estuary and Marshes is located in north Kent. The estuary forms a single tidal system with the Swale and joins the southern part of the Thames Estuary between the Isle of Grain and Sheerness. The site has a complex arrangement of tidal channels, which drain around large islands of salt marsh and peninsulas of grazing marsh. There are large areas of mudflat, which have high densities of invertebrates	3.9 km NW	None.

	providing a good food source for wading birds. Grazing marsh can also be found landward of some sea walls in the area. Small shell beaches occur too, particularly in the outer parts of the estuary. The area is very flat and low lying, with large expanses of uninterrupted views. 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 middle and outer parts of the estuary represent the most important areas for the birds. Important areas for birds include the Saltings and Hoo flats on the north side and the stretch from Copperhouse marshes eastwards towards Chetney marshes on the south side. The islands within the Medway also provide good habitat for SPA birds, in particular some of the breeding species.		
Special Areas of Conservation (SAC)			
N/A			
Ramsar Sites			
THE SWALE	An extensive complex of mudflats, saltmarsh and freshwater grazing marsh, an estuarine channel, and areas of shingle, shell and sand beaches and mussel beds. The saltmarshes and mudflats support a high species diversity of plants and invertebrates, including several nationally rare species. The area is of national importance for various breeding, passage and wintering ducks and waders, and regularly supports internationally important numbers of numerous species of wintering waterbirds. Ramsar site no. 299.	Adjacent	• Construction Noise. • Operational Noise. • Vibrations. • Visual Disturbance. • Clay Dust. • Damage to Perimeter Vegetation.
MEDWAY ESTUARY AND MARSHES	The Medway Estuary and Marshes is located in north Kent. The estuary forms a single tidal system with the Swale and joins	3.9 km NW	None.

	the southern part of the Thames Estuary between the Isle of Grain and Sheerness. The site has a complex arrangement of tidal channels, which drain around large islands of salt marsh and peninsulas of grazing marsh. There are large areas of mudflat, which have high densities of invertebrates providing a good food source for wading birds. Grazing marsh can also be found landward of some sea walls in the area. Small shell beaches occur too, particularly in the outer parts of the estuary. The area is very flat and low lying, with large expanses of uninterrupted views. 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 middle and outer parts of the estuary represent the most important areas for the birds. Important areas for birds include the Saltings and Hoo flats on the north side and the stretch from Copperhouse marshes eastwards towards Chetney marshes on the south side. The islands within the Medway also provide good habitat for SPA birds, in particular some of the breeding species.		
Local Nature Reserves (LNR's)			
N/A			
National Nature Reserve (NNR's)			
ELMLEY	Elmley National Nature Reserve 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. Main habitats: coastal	1.55km N	None.

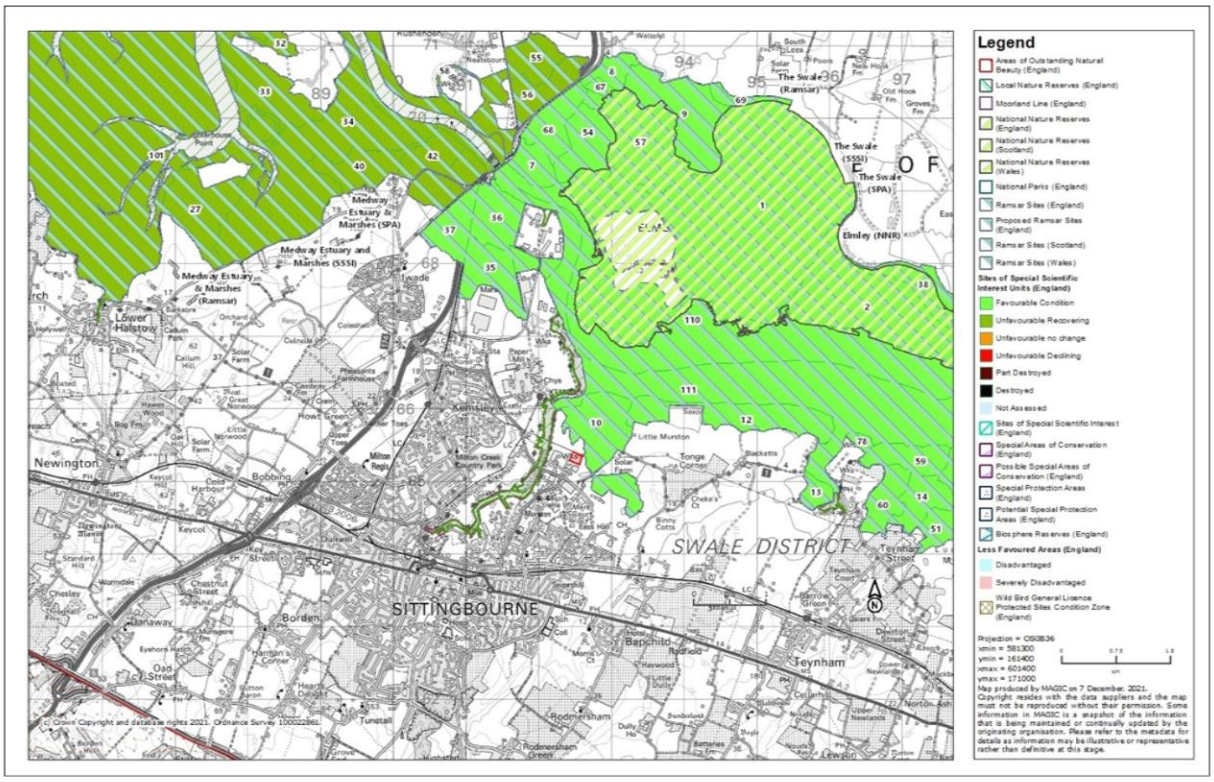

Figure 5. Location of site in relation to surrounding statutory protected sites

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5.1.2 Non-statutory sites

One Local Wildlife Site (LWS) was identified within 2 km of the proposed development site. Milton Creek LWS is located adjacent to the landowner's property and is directly west of site. The distance to the proposed new clay storage area is 340 m. This is farther than the current clay storage, though some potential for dust creation is possible. Noise from development work, operations or vegetation clearance is not expected to be significant at this distance. Therefore, due to the distance from the development this LWS is unlikely to be significantly impacted.

Table 5. Summary of Surrounding Local Wildlife Sites

Name	Features	Distance	Impact
Local Wildlife Sites/ Site of Importance for Nature Conservation			
MILTON CREEK	Milton creek estuary	Adjacent	• Construction Noise. • Operational Noise. • Vibrations. • Visual Disturbance. • Clay Dust.

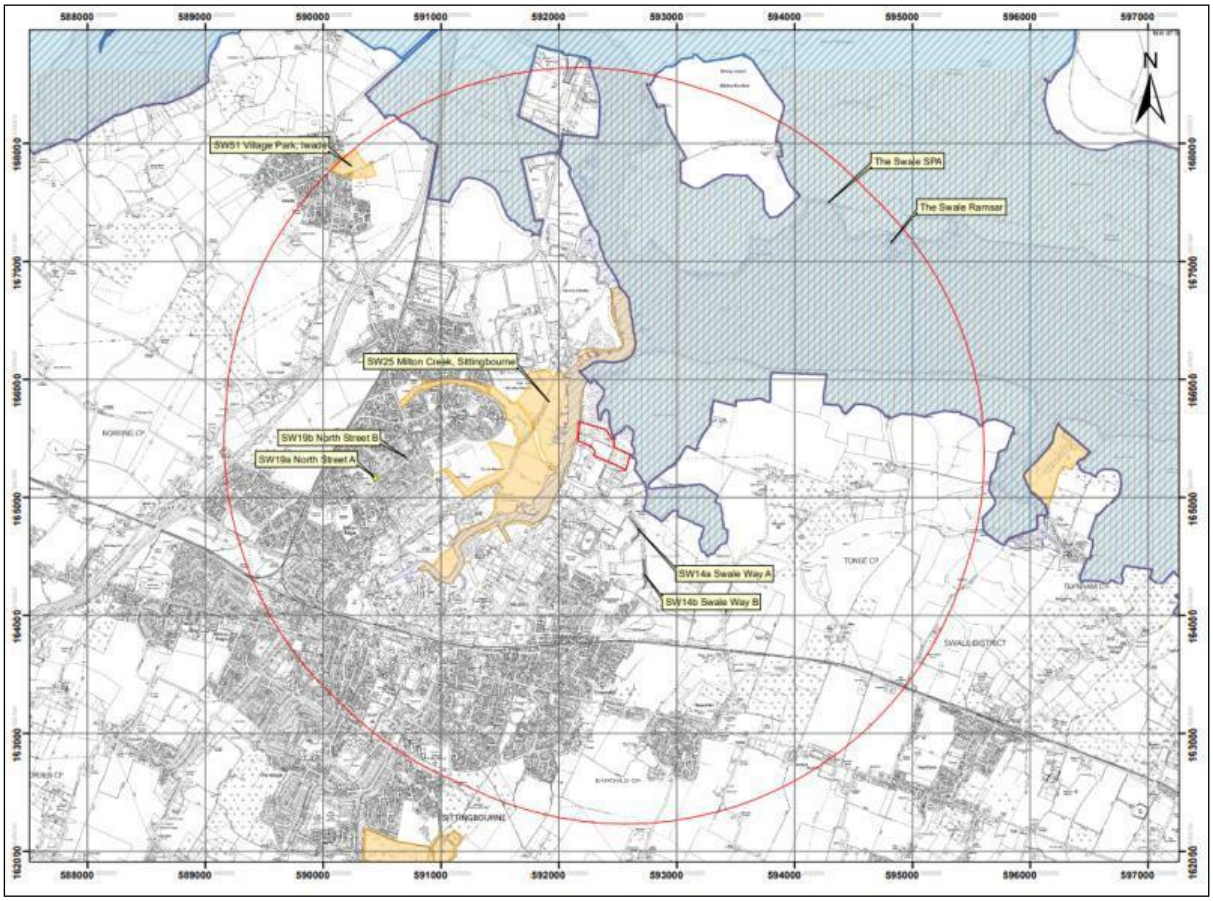

Figure 6. Map of Local wildlife sites located within a 3 km radius of the proposed development.

© Kent & Medway Biological Records Centre.

5.1.3 Priority Habitats

Several Priority Habitats are located adjacent to site, including Coastal and Floodplain Grazing Marsh, Saline Lagoons, Reedbeds, and Deciduous Woodland. None of the habitats will be cleared by the works. The location of Priority Habitats is shown on the map in figure 5.

Vegetation clearance works are limited to the footprint of the development. Damage to perimeter vegetation is possible. Loss of Coastal and Floodplain Grazing Marsh will occur. Limited loss to Deciduous Woodland will also occur during construction.

Loss of habitat should be compensated with a like-for-like habitat and footprint.

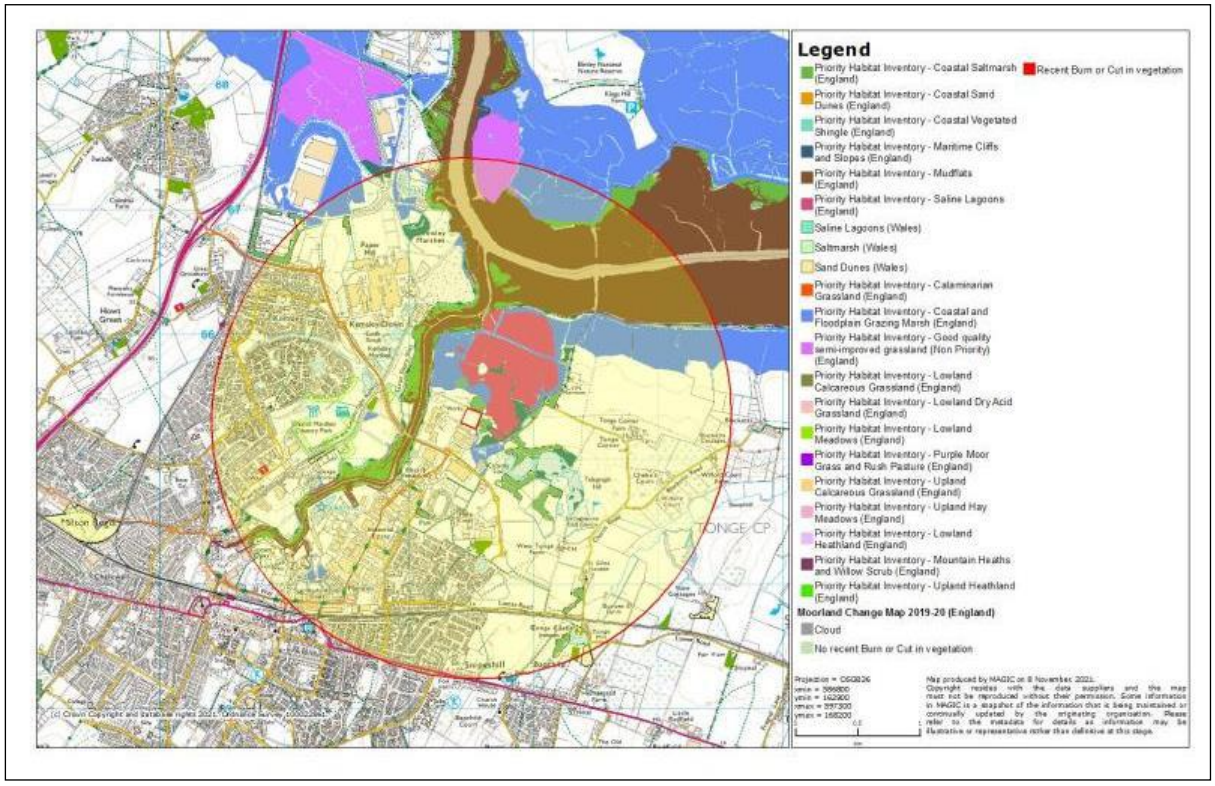

Figure 7. Map of Priority Habitat within 2 km of the Proposed Development

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5.1.4 Biological Records

Biological records were obtained from the Kent & Medway Biological Records Centre (KMBR) for a 3 km radius surrounding the application site. A total of 14924 records were obtained, which can be separated into the following groups: 493 amphibian records (11 common toad, 77 common frog, 121 smooth newt, 2 palmate newts, 82 marsh frog, 200 great crested newt); 12,329 bird records (240 species); 450 reptiles (51 grass snake, 151 common lizard, 248 slow worm; 3 fish records (1 species); 20 flowering plant records (7 species); 272 insect records (31 species); 4 marine mammal records (4 common seal, grey seal, common porpoise); 0 moss records; 1349 terrestrial mammal records (1197 European water vole, 3 badger, 6 harvest mouse, 54 hedgehog, 3 otter, 2 polecat, 26 stoat, 17 weasel, 5 water shrew, 24 common shrew, 12 pygmy shrew), 289 bat records (10 species).The significance of individual species records in the context of the current proposals is discussed in section 5.3. A full list of received records is available on request with the permission of the records centre, excluding records of sensitive species.

Biological records returned by NBN atlas within a 2 km radius included a total of 1536 species. This can be separated into the following groups: 4 amphibians (smooth newt, marsh frog, great crested newt, common frog), 1238 arthropods, 138 birds, 2 fishes, 16 mammals, 11 molluscs, 2 reptiles, 23 worms, 3 chromista, 77 fungi, 18 plants, 2 algae, 14 bryophytes, 2 flowering plants.

5.2 Site Assessment

5.2.1 On-site Habitats and Ecological Features

The site comprised Ephemeral/short perennial (J1.3), Poor semi-improved grassland (B6) and tall ruderal (C3.1). The characteristics and ecological value of each habitat is described in the paragraphs below. The extent and locations of these habitats and ecological features is also outlined on the phase 1 habitat map (Appendix 9.3 - Figure 8)

Species recorded on site include dogrose *(Rosa canina*), bramble (*Rubus fruticosus*), dogwood (*Cornus sanguinea*), hawthorn sapling (*Crataegus monogyna*), travellers joy (*Clematis vitalba*), common fleabane (*Pulicaria dysenterica*), teasel (*Dipsacus fullonum*), thistle (*Cirsium sp*.), ragwort (*Senecio jacobaea*), evening primrose (Oenothera biennis), ribwort plantain (*Plantago lanceolata*), common hogweed (*Heracleum sphondylium*), rosebay willowherb (*Chamerion angustifolium*), perennial sow thistle (*Sonchus arvensis*), German chamomile (*Matricaria chamomilla*) and bristly oxtongue (*Picris echioides*).

Woodland (A1)

Woodland is defined as vegetation dominated by trees more than 5m high when mature, forming a distinct, although sometimes open, canopy. Dominant species should be coded and the understorey and ground layer target noted. Distinct blocks of woodland, whether broadleaved or coniferous, should be mapped separately wherever possible.

Bare ground (J4)

A large portion of the site consists of compacted bare ground frequented by heavy plant vehicles. Areas of the site are also used for clay and spoil storage with regular soil movements preventing vegetation growth.

Earth bank (J2.8)

Several earth banks run along the boundary of the site. These flood attenuation bunds are overgrown with Budleja, bramble, and ruderal species such as common nettle, as well as ephemeral species on the margins.

Ephemeral/Short Perennial (J1.3)

Short, patchy plant associations typical of derelict urban sites, quarries and railway ballast. The land must be freely draining, and usually has shallow stony soil. The vegetation typically lacks a clear dominant species, but consists of a mixture of low-growing plants, often less than 25cm high. This habitat is considered to be of low ecological value.

Poor semi-improved grassland (B6)

Restricted diversity of flowering species, and being more improved, it is more likely to resemble a species poor neutral grassland.

Tall ruderal (C3.1)

This category comprises stands of tall perennial or biennial dicotyledons, usually more than 25cm high, of species such as Rosebay Willowherb *(Chamaenerion angustifolium)* and nettle (*Urtica dioica)*.

Scrub (A2)

Scrub is seral or climax vegetation dominated by locally native shrubs, usually less than 5 m tall, occasionally with a few scattered trees. The species on site include hawthorn *Crataegus monogyna*, blackthorn P*runus spinosa*, wild privet *Ligustrum vulgare*, dogwood *Cornus sanguinea*, elder *Sambucus nigra*, travellers joy *Clematis vitalba* and bramble.

Spoil (I12.2)

Several spoil heaps are present on site; these are a mixture of contemporary heaps and historic spoil covered in ephemeral vegetation. Several spoil heaps have active rabbit holes.

5.2.2 Off-site Habitat and Ecological Features

The adjacent off-site habitat includes areas of hawthorn dominated shrubland (A2) to the north as well as Coastal and Floodplain Grazing Marsh (UKBAP). Industrial complexes predominate in the west and southwest. A narrow corridor of vegetation in the south-east connects the site to further areas of grassland and shrubland. The vegetation in this corridor consists mainly of bramble, common reed, grasses, and ruderal species. Areas of wetland with reedbeds can be found to the immediate east. UKBAP habitats adjacent to site include; Coastal and Floodplain Grazing Marsh, Saline Lagoons, Reedbeds, and Lowland Mixed Deciduous Woodland. 5 ponds are located within 500 m of the proposed development area, one to the north, and four to the southeast.

5.3 Protected Species Surveys

5.3.1 Badgers

Habitat assessment: The site contains several flood attenuation bunds consisting of clay and sand, and clay stockpiles that are considered to be suitable for sett creation. The habitat was also considered to be suitable for foraging, with hawthorn shrubland and mixed deciduous woodland to the immediate north. Connective habitat was present via a strip of vegetation connecting to rural areas to the east.

Records: A total of 3 records were returned within a 3 km radius of the site by the Kent & Medway Biological Records Centre. The nearest record dating from 2014 being 1.6 km south. No records were returned by NBN Atlas. No records for badgers are present on site.

Survey results: No setts, or evidence of badger presence was found, with a distinct absence of field signs including well-worn mammal tracks, latrines, guard hairs or snuffle holes, save for 1 single footprint. This is in an area where footprints are easily found due to the on-site clay.

Figure 8: The three sites with a 50 m buffer search area.

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5.3.2 Bats:

Habitat assessment: Two warehouses are located on site. Both consist of an open steel construction. Warehouse 1 is a large open fronted warehouse used for storage of sand and ash. This building has a cavity on the lower section on the rear of the building, with an easily accessible entrance on the east side. Upon inspection it was not possible with torch to completely inspect the internals of this cavity wall and is deemed highly suitable for roosting. The top half of the warehouse is an open steel frame, which is generally considered unsuitable for roosting due to the temperature fluctuations of the metal and the draft caused by the open frame design.

The second warehouse, named Warehouse 2, is of smaller design, and is open at the front and rear. The frame is constructed of metal, with cement reinforced asbestos sheet roofing. The foundation wall is less than 1 m off the ground and does not show any cracks or crevices. No potential roost sites were found. This building is considered to be of negligible roosting potential.

Vegetation on site is sparse with limited foraging potential. While the vegetated flood attenuation bunds do form linear features there is no substantial vegetation in the areas for these to be of high foraging potential. Further, no trees are present on site. The nearby hawthorn shrub was assessed for tree cavities but none were found.

Records: A total of 198 records were returned within a 3 km radius of the site by the Kent & Medway Biological Records Centre. These include; brown long eared, serotine, Daubenton's bat, Natterer's bat, Leisler's bat, Noctule as well as common pipistrelle, Nathusius pipistrelle and soprano pipistrelle. The most recent dates to 2019 regarding a common pipistrelle. The nearest record dating from 2018 being 300 m southwest.

No known roosts are located on site.

9 separate species were returned by NBN Atlas, including; brown long-eared bat, common pipistrelle, soprano pipistrelle, serotine, Brandt's bat, Natterer's Bat, Noctule. One record for bats was present on site, a Serotine dating to 1969.

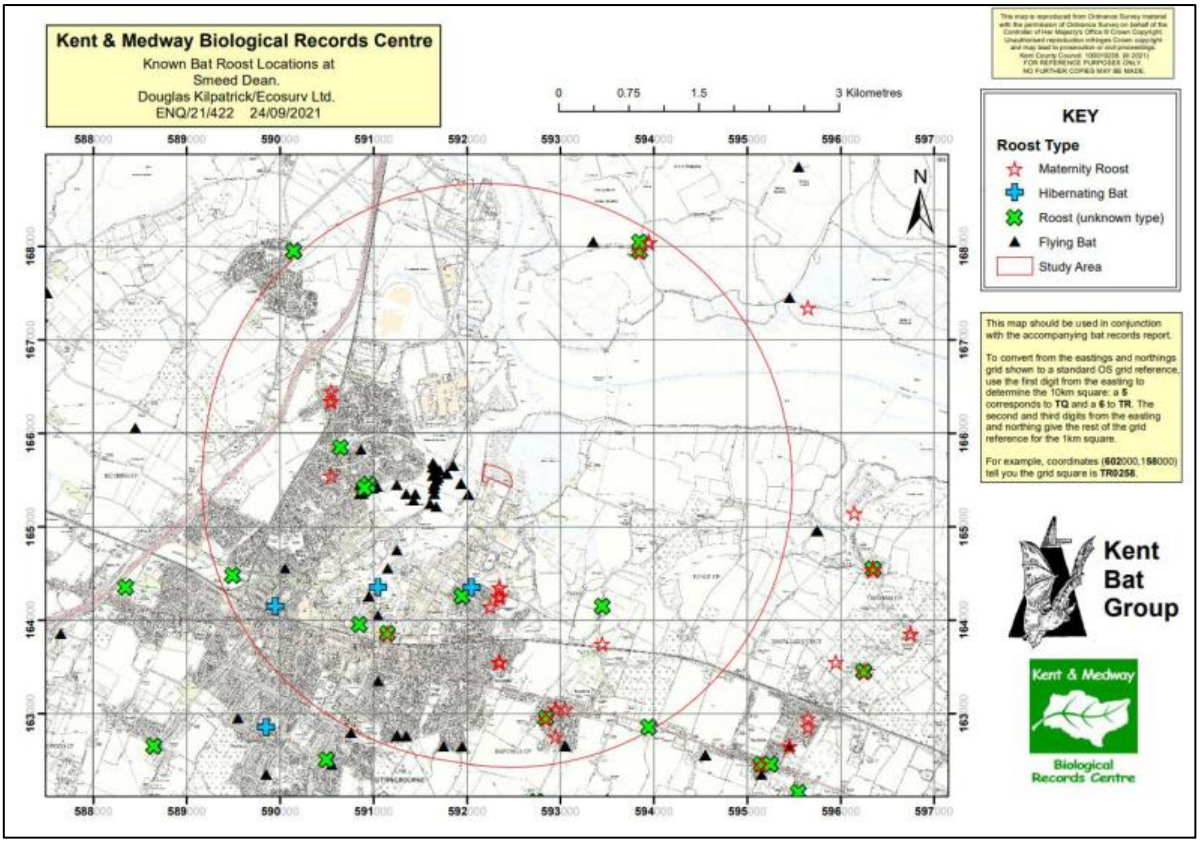

Figure 9: Known bat roost locations within a 3 km radius of the site.

Survey Results: Due to the absence of trees and the negligible roosting potential of the only 2 buildings that will be affected on site, no further bat surveys were undertaken. However, as part of our previous ecological impact assessment of the site undertaken in 2016, static monitoring surveys were undertaken to gauge general levels of bat activity on site and identify if any of the activity recorded could be attributed to roosting bats to warrant different survey methods.

5.3.3 Great Crested Newts:

Habitat assessment: There are 5 ponds within a 500 m distance of the site. One pond lies to the north, the other to the southeast. There is suitable connecting habitat between the site and the ponds, consisting of long unmanaged grasses, shrub vegetation and ruderal species. The site itself was considered suitable terrestrial habitat, based on the long unmanaged grasses and shrub, providing cover and moisture to amphibians.

Habitat Suitability Indexes (HSI's) were carried out on all ponds. In addition, each pond was torch surveyed and bottle trapped.

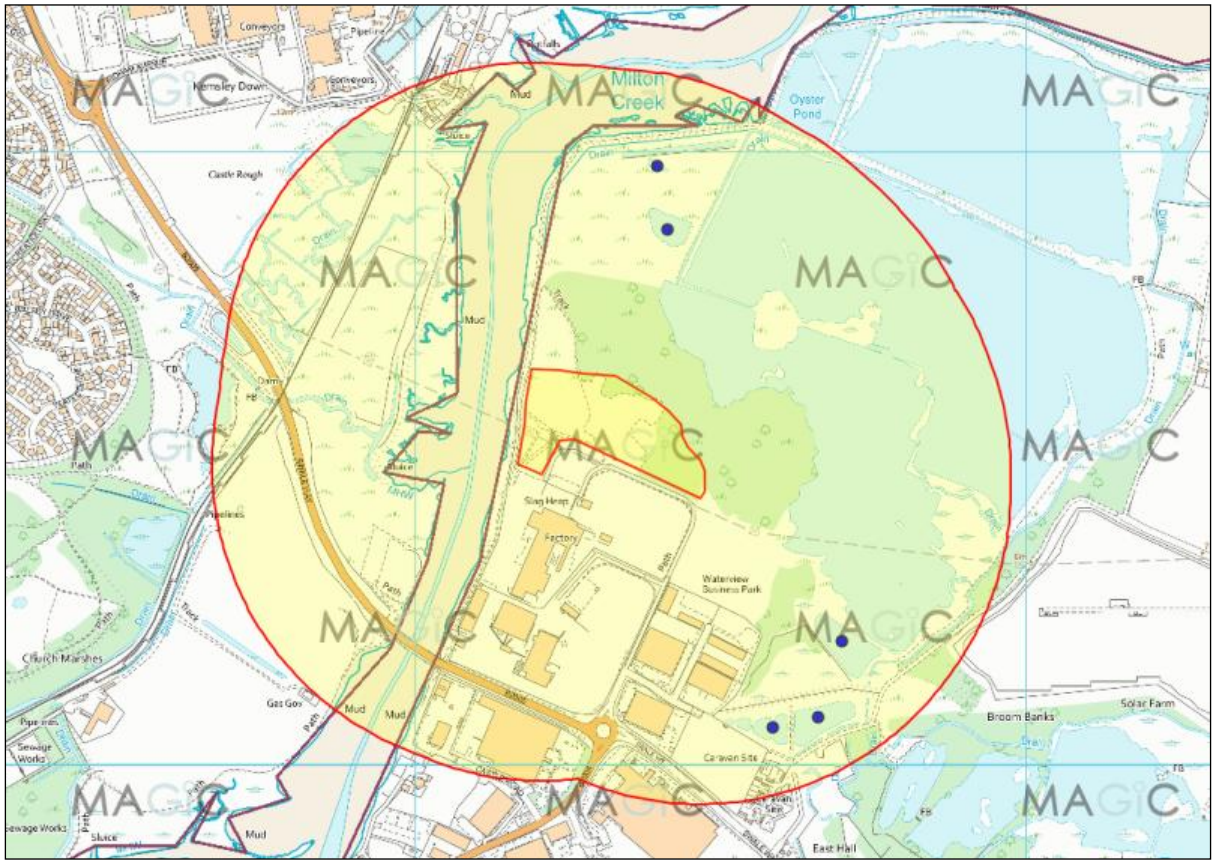

Figure 10. Map of Ponds within 500m of the proposed development

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Records: A smooth newt was found during a reptile survey conducted on site in 2017. The nearest GCN records from NBN atlas are 800 m west southwest of site and are from 2017. 200 great crested newt records were returned from the Kent & Medway biological records centre within a 3 km radius of the site. However, the majority were recorded in the Milton Creek Country Park located on the west side of the creek. Milton creek is an estuary which is considered to be a significant dispersal boundary from the west due to the saltwater content.

Survey results: No Great Crested Newts were recorded in any of the ponds surveyed.

5.3.4 Birds

Habitat assessment: The site itself is poor habitat for nesting birds, with sparse vegetation present. Most of the site is bare ground or has sparse or low growing ruderal vegetation. The vegetation that is present predominantly consists of dense bramble, dogrose, butterfly bush, and a number of other shrub species. This shrub vegetation that is present is limited in size which restricts the potential for larger nesting birds. The site itself is therefor considered poor habitat.

However, 3 statutory sites are directly adjacent to site. The Swale SSSI, SPA, Ramsar, is a wetland of international importance, comprising intertidal mudflats, shell beaches, saltmarshes and extensive grazing marshes. It provides habitats for important assemblages of wintering waterfowl and also supports notable breeding bird population.

Records: A total of 7,545 records were returned within a 3 km radius of the site by the Kent & Medway Biological Records Centre. The nearest record dating from 2014 being 1.6 km south. 276 species were returned by NBN Atlas within a 5 km radius of the site. 351 bird records are present for the site, split between 78 species.

Survey results: Winter bird surveys have been undertaken on site throughout the 2021-2022 winter season, with four surveys undertaken in total. 41 species were noted within and to the surrounding areas of the site. Of these, 3 species are protected under NERC S41, 3 are protected under Annex 1, 5 are Red listed and 7 are protected under Schedule 1.

No wetland or wintering waterfowl species were observed making use of the proposed development areas. The woodland birds recorded were only noted flying over site and not made use of the site itself. A number of smaller birds were noted foraging on the Paddock

Bird observations during site visits outside of the wintering bird surveys included 23 species.

Table 6. Winter bird survey results.

Common name	Latin name	NERC S41	Annex 1	BoCC	Schedule 1	17th December 2021	24th January 2022	24th February 2022	29th March 2022
Avocet	Recurvirostra avosetta		x	Amber	x	0	4	4	0
Blackbird	Turdus merula			Green		5	6		1
Black-headed gull	Chroicocephalus ridibundus			Amber		0	1	3	9
Brent goose	Branta bernicla			Amber		0	0	0	7
Buzzard	Buteo buteo			Green		0	0	0	2
Canada goose	Branta canadensis			Introduced		0	0	0	2
Carrion Crow	Corvus corone			Green		0	0	0	8
Cetties warbler	Cettia cetti			Green	1	0	0	0	2
Chiffchaff	Phylloscopus collybita			Green		0	0	0	4
Cormorant	Phalacrocorax carbo			Green		5	6	2	1
Dunlin	Calidris alpina			Red		16	6	6	8
Dunnock	Prunella modularis			Green		0	0	0	1
Eurasian curlew	Numenius arquata	x		Red	x	1	2	2	0
European Coot	Fulica atra			Green		8	8	2	6
Feral pigeon	Columba livia			Green		0	0	0	4
Graylag goose	Anser anser			Amber		0	0	0	4
Great crested grebe	Podiceps cristatus			Green		2	2	1	3
Great white egret	Ardea alba		x	Amber		0	0	2	
Greenshank	Tringa nebularia			Amber	x	0	1	0	
Grey heron	Ardea cinerea			Green		1	0	0	0
Herring Gull	Larus argentatus	x		Red		0	1	1	0
Kestrel	Falco tinnunculus			Green		0	0	0	1
Knot	Calidris canutus			Amber		1	15	8	
Little egret	Egretta garzetta		x	Green		1	3	0	3
Little grebe	Tachybaptus ruficollis			Green		0	1	1	0
Magpie	Pica pica			Green		1	2	0	1
Mallard duck	Anas platyrhynchos			Amber		0	6	0	2
Northern pintail	Anas acuta			Amber	1 part II	1	0	0	0
Oyster Catcher	Haematopus ostralegus			Amber		0	1	3	0
Pheasant	Phasianus colchicus			Introduced		1	0	0	1
Pink-footed Goose	Anser brachyrhynchus			Amber		0	0	1	0
Pochard	Aythya ferina			Red		0	40	0	0
Scaup	Aythya marila	x		Red	x	0	40	0	0
Smew	Mergus albellus			Red	x	0	2	0	0
Teal	Anas crecca			Amber		0	20	0	0
Tufted duck	Aythya fuligula			Green		0	11	0	20
Water rail	Rallus aquaticus			Green		0	0	0	0
Wigeon	Anas penelope			Amber		68	4	12	7
Woodpecker sp.	-			-		0	0	0	1
Woodpigeon	Columba palumbus			Amber		1	0	0	3
Wren	Troglodytes troglodytes			Amber		1	0	0	2

Table 7: Spatial locations of bird observations

No.	Description	Image
1.	December 2021	

2.	January 2022	
3.	February 2022	
4.	March 2022	

Table 8: Spring / Summer bird observations

Common name	Latin name	NERC S41	Annex 1	BoCC	Schedule 1	21st September 2021	8th April 2022	13th April 2022	21st April 2022	6th May 2022	12th May 2022
Blackbird	Turdus merula			Green		x			x	x	x
Blackheaded gull	Chroicocephalus ridibundus			Amber							x
Blue tit	Cyanistes caeruleus			Green		x					
Buzzard	Buteo buteo			Green		x					
Carrion crow	Corvus corone			Green		x					
Chiffchaff	Phylloscopus collybita			Green		x			x	x	x
Cormorant	Phalacrocorax carbo			Green		x					
Cuckoo	Cuculus canorus	x		Red							x
Eurasian blackcap	Sylvia atricapilla			Green				x	x	x	
European Serin	Serinus serinus			Former breeder	x						x
Greater Whitethroat	Curruca communis			Amber							x
Green winged Teal	Anas crecca			Amber							x
Grey heron	Ardea cinerea			Green		x					
European Coot	Fulica atra			Green							x
Long tailed tit	Aegithalos caudatus			Green		x		x	x		
Nightingale	Luscinia megarhynchos			Red						x	
Goldfinch	Carduelis carduelis			Green			x				
Reed warbler	Acrocephalus scirpaceus			Green							x
Rook	Corvus frugilegus			Amber						x	
Starling	Sturnus vulgaris	x		Red		x					
Swallow	Hirundo rustica			Green							x
Tufted duck	Aythya fuligula			Green			x				
Woodpigeon	Columba palumbus			Amber		x					

5.3.5 Reptiles

Habitat assessment: The site was considered suitable reptile habitat, consisting of long grasses and meadow species. Tracks and open patches provided suitable basking spots. A previous reptile survey conducted in 2017 found no evidence of reptiles on site.

Records: A data search from the Kent & Medway biological records centre included slow worm, viviparous lizard, grass snake within a 3 km radius of the site. Of these a single grass snake (*Natrix Helvetica*) was recorded on site in 1965. A single slowworm (*Anguis fragilis*) was recorded on site during the PEA from 2017.

Survey results: A seven-day reptile population survey was conducted on site between the 7th of April 2022 and the 22nd of June 2022. In total 123 reptiles were recorded, including 33 Viviparous lizards (*Zootoca vivipara*), 86 Slow worms and 4 Grass snakes.

Table 7. Summary of reptile surveys.

Author: Douglas Kilpatrick

		Common Name	Viviparous Lizard	Slow Worm					Grass snake	Adder	Smooth snake	Sand lizard							
		Latin Name	*Zootoca vivipara*	*Anguis fragilis*					*Natrix natrix*	*Vipera berus*	*Coronella austr*	*Lacerta agilis*							
Date:	Survey Number			Not sexed	Male	Female	Subadult	Juv					Weather: Time	Temperature	Cloud cover	Humidity	Precipitation	Dry/Wet?	Wind
07/04/2022	Set up																		
13/04/2022	1	1 adult, 1 subadu	1	0	0	1	0	0	0	0	0	0	13:30	17c	Parly cloudy	61%%	10%%	Dry	11mph
21/04/2022	2	1 (subadult)		0	0	0	0	1	0	0	0	0	13:30	16c	Clear	60%	1%	Dry	16mph
06/05/2022	3	2		4	2	0	0	0	0	0	0	0	15:00	21	Sunny	34%	1%	Dry	12mph
12/05/2022	4	9		10	0	0	0	0	0	0	0	0	15:00	19	Mostly sunny	46%	0%	Dry	14mph
26/05/2022	5	9	15	8	3	4	3	1	0	0	0	0	14:45	19	Mostly cloudy	64%	1%	Dry	16mph
01/06/2022	6	9		10	7	1	7	2 juveniles	0	0	0	0	11:00	14c	Mostly cloudy	65%	7%	Dry	7mph
22/06/2022	7	1		3	4	2	1	0	0	0	0	0	09:30	18c	Clear	56%	5%	Dry	8mph
		Total										Sum Total							
		33	16	35	16	8	11	4	0	0	0	123							

Figure 11: Satellite image of the site presenting the spatial locations of reptiles recorded.

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5.3.6 Dormouse

Habitat assessment: The shrubland adjacent to the Ash stockpile was considered to have moderate suitability for hazel dormouse. Species composition included the presence of at least 6 food resources utilised by dormice including hawthorn, blackthorn, elder, dogwood, honeysuckle and bramble. Though the majority of the site consisted primarily of hawthorn and blackthorn. The habitat had well developed undergrowth in a few locations but the majority of the site was absent of undergrowth with no bramble. Connectivity with the canopy was good in areas though dirt trackways through the shrub fragmented the habitat to a degree. Tree hollows were absent on all hawthorn shrub surveyed. Areas for torpor are likely to be very rare in this habitat. Connecting habitat to the wider landscape is limited to a small strip to the south east. Due to the

The majority of the vegetation is less than 21 years old therefore it is not possible to have a relic population. In addition, due to the limited connecting habitat to the site and the limited time for populating it, presence was considered extremely unlikely.

The Paddock and Tile Factory were considered unsuitable.

Records: No biological records were returned by the Kent & Medway biological records centre within a 3 km radius of the site.

8 records were returned by NBN Atlas within a 5 km radius of the site. No records are present for the site. The most recent record dates to September 2017 4.9 km south of site. The nearest record was recorded 4.6 km southwest of site.

Survey Results: It was considered highly unlikely hazel dormouse would be present on this site. Therefore, further surveys were not conducted.

5.3.7 Otter

Habitat assessment: An otter survey was conducted along the bank of the Swale on 5th September 2022. This involved the search for field signs that indicate the presence of otter in the area. Field signs included features such as otter spraint, feeding stations, trackways, tracks, and hollows in the bank. No field signs were found during the survey.

Records: Three otter records were returned from the record centre. The most recent dates to 22nd February 1982, approximately 850 m east southeast of the site. Suitable connective habitat is present between these two sites. No records were returned by NBN Atlas.

Survey results: No fields signs were recorded to suggest presence of otter on site.

5.3.8 Water vole

Habitat assessment: A water vole survey was conducted in tandem with an otter survey on the 5th September 2022. This involved surveys for droppings or latrines, burrows in the bank, footprints in mud, grazed vegetation or direct observations.

Records: No records were returned by NBN Atlas within a 2 km radius of the site.

No records were turned by the Kent & Medway biological records centre.

Survey results: No evidence of water vole was recorded during the survey.

5.3.9 Other wildlife

Rabbit

Rabbit has been recorded on site and rabbit holes are present in several areas that fall within the development. It is likely these will be displaced and the rabbit holes destroyed. While their burrows and habitat are not protected, rabbits fall under the Wild Mammals (Protection) Act (1996) which protects them from undue cruelty.

Fox

Fox tracks have frequently been recorded on site. It is likely that these individuals will be displaced and habitat lost. Their habitat is not protected. They are however protected under the Wild Mammals (Protection) Act (1996) which protects them from undue cruelty.

Hedgehogs: There is limited woodland on site, however there may be limited scope for hedgehogs to be present within the shrub. No Hedgehog have been observed during any site visits. Hedgehog is a UK BAP priority species. They are also protected under the Wild Mammals (Protection) Act (1996) which protects them from undue cruelty.

5.4 Invasive Species

A high volume of butterfly bush (*buddleia davidii)* was present on site, most notably on disturbed ground such as the clay bunds.

No other invasive species – including non-native invasive species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) – were recorded within the site extent at the time of the site survey, or within habitats adjacent to the site.

6 MITIGATION

Badgers: Due to the absence of badger setts on site or within a 50 m buffer, no mitigation strategy is required. Enhancement recommendations for badgers can be found in chapter 7.

Bats: Due to the absence of suitable roosting sites on this site the impact on roosting bats is expected to be negligible.

However, a loss of foraging habitat will occur in the Paddock area. To mitigate for the loss of foraging habitat, insect recruitment in the remaining areas should be increased. To increase insect recruitment a number of insect hotels in the immediate area should be placed. In addition, items such as dead wood should be spread in the surrounding habitat. A wide variety of flowering plants and bushes should be planted to support a wide range of insects.

In addition, commuting routes may be impacted due to changes in:

- linear features,
- increase in site activity during the early mornings, evenings and nights and
- the introduction of artificial lighting such as floodlights or vehicle lights.

The linear features include the vegetated flood attenuation bunds present on site, or the vegetated field margins. To reduce the impact on commuting bats, the linear features lost should be replaced and replanted. The construction of a flood attenuation bund along the perimeter of the Swale is required by Natural England, and may serve as the mitigation.

The new factory will likely include floodlights and plant vehicle headlights. Artificial lighting have been shown to impact behaviour in certain species of bat. To reduce the impact of lighting to commuting or foraging bats, a low-level lighting scheme should be adopted during and after the works to avoid indirect disturbance to foraging and commuting bats as well as birds and small mammals that may be using the site boundary vegetation. The scheme should include the following elements:

Sensitive positioning of lighting to avoid unnecessary spill onto trees and vegetation/any habitat enhancement features to be incorporated into the works (see below).

Angle of lighting: avoidance of direct lighting and light spill onto areas of habitat that are of importance as commuting pathways and/or foraging areas. Reduce the height of lighting columns to avoid unnecessary light spill. No lights should be angled towards or spill onto the Swale.

Type of lighting: studies have shown that light sources emitting higher amounts of UV light have a greater impact to wildlife. Use of narrow-spectrum bulbs that avoid white and blue wavelengths are likely to reduce the number of species impacted by the lighting. Red lighting schemes has been shown to have minimal impact on bats.

Limit the lighting period during the night. Where possible lights should be switched off when the plant is not in operation. No automatic IR sensor lights should be implemented as these may be triggered by moths, foxes, rabbits or other wildlife.

Great crested newt: Due to the likely absence of great crested newts on this site, no mitigation strategy is required. Enhancement recommendations for GCN can be found in chapter 7.

Birds: The site itself is not utilised by wintering birds. Several birds have been noted flying over the site though none have landed within the Paddock, Ash Stockpile or Tile Factory boundaries. However, wintering birds within the Swale are within 30 m of the proposed development. Noise disturbance and visual disturbance during and after the development will be increased.

Placement of a 1.5 m flood attenuation bund along the perimeter to the Swale SSSI, Ramsar, SPA, is needed in accordance with requirements made by Natural England to limit sediment runoff into the adjacent protected area. This will also provide a visual barrier to the Swale. However, the height of the bund is likely insufficient for the purpose. Recommendations for enhancement of the bund are discussed in chapter 7.

Clay dust from the Paddock clay stockpile and exhaust from the Tile Factory once operational may have an undetermined impact on the adjacent protected area. It should be noted that the current clay stockpile is already present on site, though at a distance of approximately 180 m. Dust reduction strategy may be considered.

Impacts to local breeding birds in general are assessed as being a minor negative impacts at a localised scale. A minimal loss of nesting habitat will occur for smaller birds. Smaller bird boxes can be placed in the adjacent shrub and woodland to compensate for the loss of nesting potential of the shrub. A limited amount of foraging habitat will be lost. This may be compensated by implementing a planting scheme on the attenuation bund.

Reptiles: Based on the results of the 7-day reptile population surveys suggest that reptiles are present in high numbers on site and will significantly impacted. Because the proposed development will destroy on site habitat it is recommended that a 30-day reptile translocation is conducted to remove the majority of the reptiles present on this site. In order to prevent reptiles and other small terrestrial animals from re-entering the site, reptile fencing should be erected. It is considered unnecessary to erect fencing on the western and southern side of the site, due to these being developed areas unsuitable for wildlife. The fencing may be considered a permanent feature.

Figure 12: The Paddock marked in red. Proposed reptile fencing area marked in yellow.

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An appropriate receptor area is required for the translocated individuals. Suitable receptor sites are located 137 m north and 413 m northwest. These sites consist of tall unmanaged grassland, meadow and shrub. Habitat improvement will be necessary to increase the carrying capacity of these sites. This may include the addition of artificial hibernacula.

The connecting habitat to the southeast should remain intact to allow dispersal into the wider landscape. The new flood attenuation bund may act as additional habitat for reptiles, and should include reptile hibernacula, brush, as well as suitable habitat of long grasses.

Dormouse: It is believed that dormice are likely absent from the site and therefor the direct impact will be negligible. A strip of connecting habitat along the bank of the Swale should be retained to allow passive dispersal of dormice into the habitat north of site in future.

Otter: It is believed that otters are likely absent from the site and therefor the direct impact will be negligible. The embankment of the Swale will not be altered and no change in habitat availability will occur.

Water vole: Water voles are likely absent from site and therefor the direct impact will be negligible. The embankment of the Swale will not be altered and no change in habitat availability will occur.

Rabbit: Rabbit will be excluded from the active rabbit holes using one-way flaps. The flood attenuation bund will provide compensatory habitat for rabbit hole creation.

Fox: None required.

Hedgehog: An Ecological Clerk of Works will be present during vegetation clearance and will check any potential debris prior to clearance. If any hedgehogs are encountered, they will be moved to adjacent habitat. Habitat lost will be compensated by the creation of habitat on the new flood attenuation bund. Dead wood and other natural materials may be placed on the bund to mitigate for lost foraging habitat.

Vegetation:

Any vegetation cleared during the works should be replaced with compensatory planting, where feasible to do so, in order to off-set the impact of the clearance. Particularly UKBAP priority habitats should be compensated with similar habitats where possible.

Mixed wildflower seed can be planted to rapidly increase plant biodiversity on site in the short term. This will aid in supporting local pollinating insects and increase the carrying capacity for bats due to the increase in insects.

Trees to be retained are to be protected using Heras or equivalent fencing around their Root Protection Areas, in accordance with British Standard documentations BS 5837:2012 – ‘Trees in relation to design, demolition and construction. Recommendations.’ Advice from a professional arboriculturist should be sought when establishing the protection areas.

This extends as far as practicable to the construction of the flood attenuation bund. The bund should be constructed outside the tree root area of the retained vegetation as increased weight of the bund will put pressure on the soil below.

7 ENHANCEMENT

Biodiversity Net Gain is expected to become a mandatory requirement in Winter 2023. The target includes a minimum increase of 10% of the baseline calculation, prior to site development. The aim is to avoid the degradation of UK habitat by retaining and enhancing habitat or off setting damage. Biodiversity net gain is calculated using the Biodiversity metric 3.0.

As part of the National Planning Policy Framework there is an assumption that as part of any development for opportunities to incorporate biodiversity in and around developments should be encouraged.

Industrial premises due to continual disturbance within a site tend not to provide a suitable site for such enhancement and therefore off-site enhancement should be an alternative. This may be by way of a Section 106 agreement with the local authority.

Flood attenuation bund: A flood attenuation bund is to be constructed in line with requirements laid out by Natural England. The bund aims to reduce runoff from the site into the surrounding habitat. Minimum requirements for the bund were previously set at 1.5 m in height.

The flood attenuation bund should also aim at reducing visual and audible disturbance along the Swale and adjacent habitats. Each species has varying tolerance levels to either visual and audio disturbances. The species with the lowest tolerance level is of most concern. To this end visual and audio disturbance from the proposed factory should be brought down to below this tolerance.

Visual disturbance will include humans, cars and plant movement such as bulldozers and diggers. Diggers (e.g. JCB's) operating on site can exceed 20 tons, with the digger arm reaching up to 9.5 m high. The bund and screening combined must therefore reach a minimum height of the vehicles planned to be used on site in order to block visual cues. This may be accomplished by increasing the height of the attenuation bund, and adding a screening hedge on top. This will also have the combined effect of minimising changing the aesthetic of the surrounding natural environment.

The bund should also have a waved profile along the horizontal (x) axis. This allows for a greater surface area to be used for wildlife.

A screening hedge should be planted to the west side of the site between the pylon linking up with the existing tree line located to Milton Creek the west of the current factory and its yard. A dense hedge of hawthorn, blackthorn and sea buckthorn should be stagger planted to produce a hedge of at least 1 metre in depth by 2 metres high as such will screed the site car park and storage area from wildlife on the creek and provide additional habitat for wildlife in the immediate area.

Badgers: Due to the likely absence of badgers in the area, no enhancements are needed. However, the new flood attenuation bund will provide suitable habitat for the creation of a new sett. The inclusion of an artificial badger sett may also be considered as part of the flood attenuation bund, which may be incorporated into the bund itself.

Bats: As a measure to enhance the local woodland and shrubland, it is recommended a number of bat boxes are placed to increase the roosting capacity of this area. The current woodland is young and the trees do not have cracks or crevices that may provide tree roosts. The shrubland is also of inadequate species composition to provide suitable tree roosts. Bat boxes may be installed throughout the site.

Great crested newt: The connecting habitat to the southeast should be retained. The flood attenuation bund can include reptile and amphibian hibernacula which will benefit GCN as well. Reptile fencing may remain in place which will prevent any future GCN and other amphibians or small mammals from entering the clay stockpile area.

Birds: Bird boxes of varying sizes may be installed throughout the retained shrubland and woodland.

Barn owl hunting perches may be installed in the areas of open grassland to the north. These should be placed 10 m apart. Barn owl boxes incorporated into the building design may also be considered.

Swallow specific bird boxes may also be considered on site.

Reptiles: Artificial hibernacula should be created in the receptor sites and along the connecting habitat. These hibernacula should follow recommendations set out by ARG UK and include materials such as wood, stone and soil. Permanent reptile fencing should be considered around the clay stockpile.

Dormouse: Installation of dormouse boxes within the wood and shrubland and along the connecting habitat may be considered. Dormouse specific food sources may be planted on the attenuation bund. These include Hazel, Buckthorn, Blackthorn, Ash, Oak, Birch, hawthorn, sycamore, wayfaring, elder, dogwood, yew, honeysuckle and bramble.

Hawthorn and blackthorn are already present in large quantities on site and may be omitted from any planting scheme.

Otter: It is important the banks of the Swale remain viable habitat for future reoccupation of otters. A buffer zone along the bank of the Swale should be incorporated into the development. This may be done in conjunction with the construction of a flood attenuation bund.

Water vole: Similar to otter, the banks of the Swale should remain viable for future reoccupation. A buffer zone along the bank of the Swale should be incorporated into the development.

Rabbit: The flood attenuation bund will provide compensatory habitat for rabbit hole creation.

Fox: Artificial badger setts will also provide suitable shelter for foxes.

Hedgehog: Retention of the connecting habitat to the southeast is important to allow dispersal to and from site. Appropriate planting of the attenuation bund and placement of deadwood along the strip. Permanent habitat fencing along the perimeter of the clay stockpile may be beneficial to help exclude hedgehogs from the active operations.

Invertebrates: To increase invertebrate recruitment a number of insect hotels in the immediate area should be placed. Particularly the flood attenuation bund, but may also include areas in the woodland and scrubland. In addition, items such as dead wood should be spread in the surrounding habitat. A wide variety of flowering plants and bushes should be planted to support a wide range of insects.

Plants: Native UK wildflowers can be seeded along the entirety of the flood attenuation bunds. This will rapidly increase biodiversity of the site and increase foraging habitat for invertebrates. Note that seeding should be conducted only during certain times of year. Sow during March and April or in September, depending on soil conditions.

8 CONCLUSIONS & RECOMMENDATIONS

The surveys carried out on site have considered the impacts to protected habitats, bats, breeding birds and reptiles.

- The Swale is adjacent to site. This is a designated SPA, Ramsar and SSSI. No works are to infringe on the perimeter of the protected area without prior authorisation from Natural England.
- Reedbed, lowland mixed deciduous woodland, and Coastal and Floodplain Grazing Marsh (UKBAP) are located on or adjacent to site. Damage to perimeter vegetation will occur. Compensatory planting should be considered.
- Results of the 7-day reptile population surveys suggest that reptiles are present in high numbers on site and will significantly impacted. A 30-day translocation is recommended and mitigation habitat creation. Reptile exclusion fencing required
- The otter survey found no evidence of field signs around the Swale waterline. It is believed otters are absent from this site and therefor won't be impacted.
- The badger survey has found no evidence of setts within the site or within a 50 m buffer thereof. A single badger print was found north of site. It is not expected that badgers will be impacted by the development.
- Breeding bird surveys have not identified any birds making use of the *Paddock* area. A limited number of smaller birds make use of the site which will have a minor negative impact at a local level.
- Wintering bird surveys have identified several BoCC red list, Annex 1 and Schedule 1 that make use of the Swale (Ramsar, SSSI). Noise from the development and operations may disturb these species. None were observed on the footprint of the site. Increase height of screening hedges and bunds to reduce disturbance cues.
- No bat roosts have been identified on site. Presence of foraging and commuting bats was noted. Compensatory planting to create linear features. Increase insect recruitment to offset loss in suitable foraging habitat. Placement of bat boxes in the adjacent shrub and woodland to increase roosting potential around the site.
- The water vole survey found no evidence of field signs around the Swale waterline. It is believed water voles are absent from this site and therefor won't be impacted.
- No presence of hazel dormouse was noted.
- No presence of great crested newt was noted.
- Rabbit is present on site. Exclusion prior to rabbit hole destruction.
- Fox is present on site. No mitigation is required.

Table 8. ECIA Summary Table

Species/ Habitat	Impact	Magnitude	Mitigation/ Compensation	Significance of effects after mitigation
Badgers	None	Negligible	None	Negligible
Bats	• Change in commuting habitat • Possible loss in foraging habitat	Low	None	Low
Birds	• Loss of foraging habitat • Loss of nesting habitat • Noise disturbance • Visual disturbance • Clay dust • Vibrations from ongoing operations	Moderate	• Increase screening height. • Installation of bird boxes in neighbouring woodland and shrubland. • Vegetation clearance outside of nesting bird season. (March – August). Where this is not possible a suitably qualified Ecologist should make a check of the buildings and surrounding vegetation to identify the presence of any active nests.	Low
Great crested newt	• Loss of terrestrial habitat	Negligible	• Retention of a connecting habitat strip for dispersal.	Negligible
Reptiles	• Loss of habitat.	High	• Translocation of reptiles in the designated area. • Construction of hibernacula in receptor sites. • Retention of a connecting habitat strip for dispersal.	Moderate
Hazel Dormouse	None	Negligible	None	Negligible
Otter	None	Negligible	None	Negligible
Watervole	None	Negligible	None	Negligible
Rabbit	• Loss of foraging habitat • Loss of place of shelter	High	• Exclusion of rabbits from rabbit holes • ECoW present during development	Moderate
Fox	• Loss of foraging habitat • Loss of place of shelter	Low	None	Low
The Swale	• Dust • Vibrations	Moderate	• Dust suppression to be used where required to avoid degradation of surrounding habitat	Moderate
Reedbed	• Damage to perimeter vegetation	Low	• Enforce perimeter with markers	Low

			• ECoW presence during construction • Compensatory planting • Increase buffer zone	
Coastal and Floodplain Grazing Marsh	• Reduction in habitat • Damage to perimeter vegetation during construction.	High	• Enforce perimeter with markers • ECoW presence during construction • Compensatory planting • Increase buffer zone	Moderate
Lowland mixed deciduous woodland	• Damage to perimeter vegetation during construction. • Reduction in habitat	Moderate	• Enforce perimeter with markers • ECoW presence during construction • Compensatory planting • Increase buffer zone • Tree root protection	Moderate (Damage to established trees persistent)

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10 SITE IMAGES

10.1 The Tile Factory

No.	Description	Image
1.	Warehouse 1, used for ash and sand storage.	
2.	The open front allows access for feral pigeons up in the rafters. These may make use of the building during nesting season.	

3.	East side view of warehouse 1 cavity wall	
4.	View inside cavity wall using torch.	

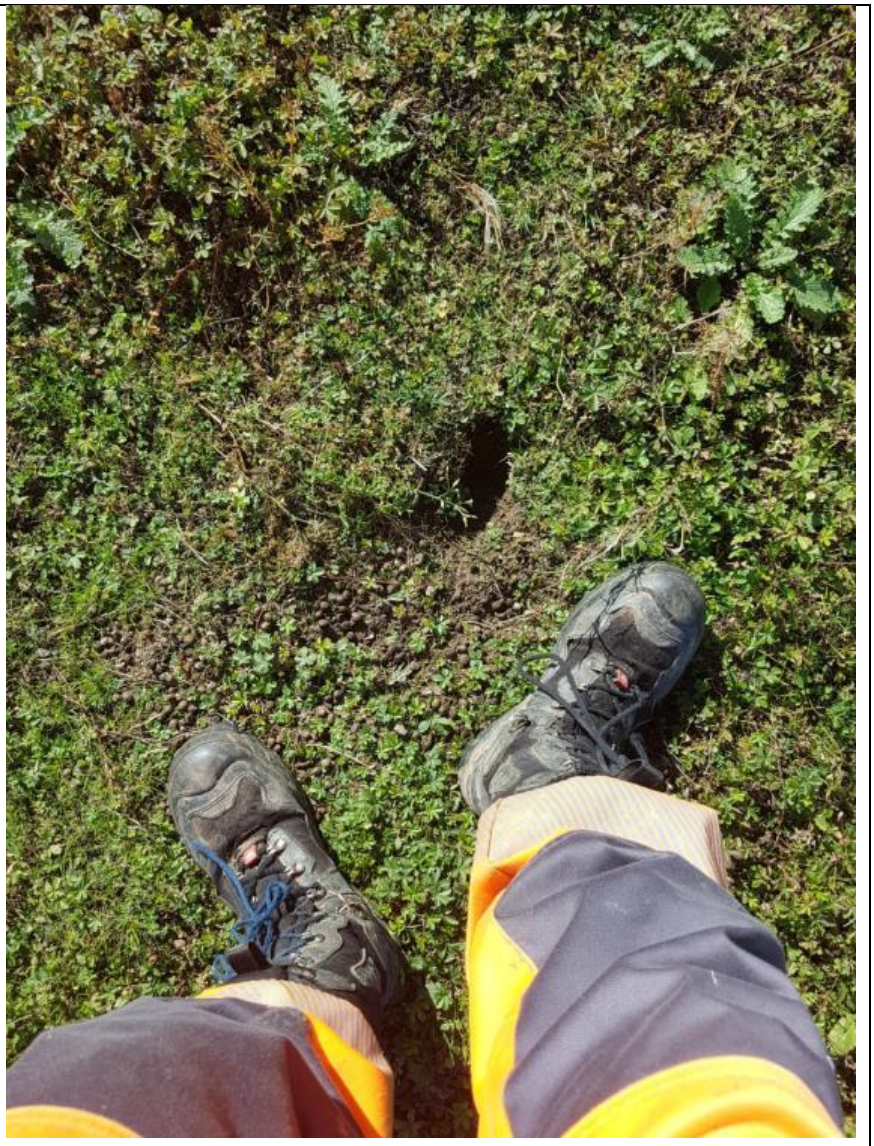
5.	Warehouse 2.	
5.	Warehouse 2. A steel construction with asbestos roofing. No evidence of previous bird nesting. Low brick walls are present as foundation. A metal machine is stored at the rear.	

6.	Metal machine inside warehouse 2.	
7.	Disused tractor with grasses, ruderal and butterfly bush.	

8.	Clay storage area (facing east) covered in ephemeral vegetation. Frequent soil movements prevent more vegetation from occurring.	
9.	Clay storage area (facing north east). The material consists of clay brickearth.	

10.2 The Paddock

No.	Description	Image
1.	Areas predominant in teasel and grasses.	

2.	Rabbit droppings and digging.	
3.	Patches of shrub and grass. The artificial mound in the background has butterfly bush.	

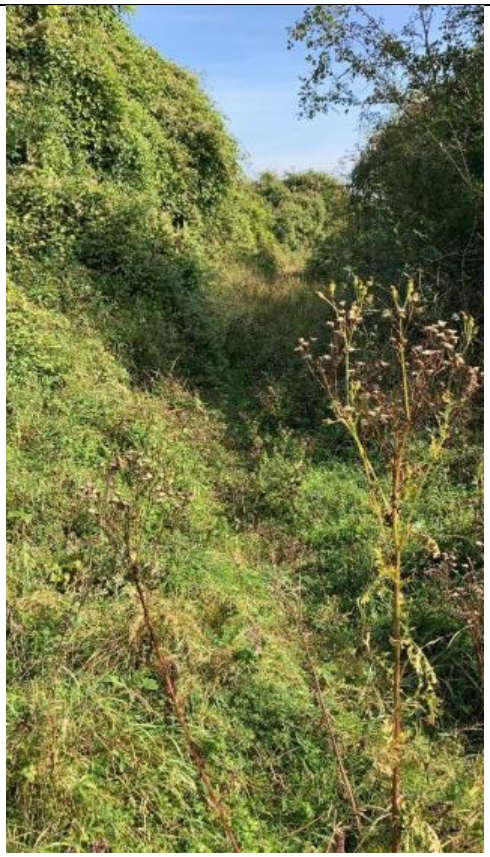
4.	Facing north-east towards the pylons.	
5.	Access road facing east.	

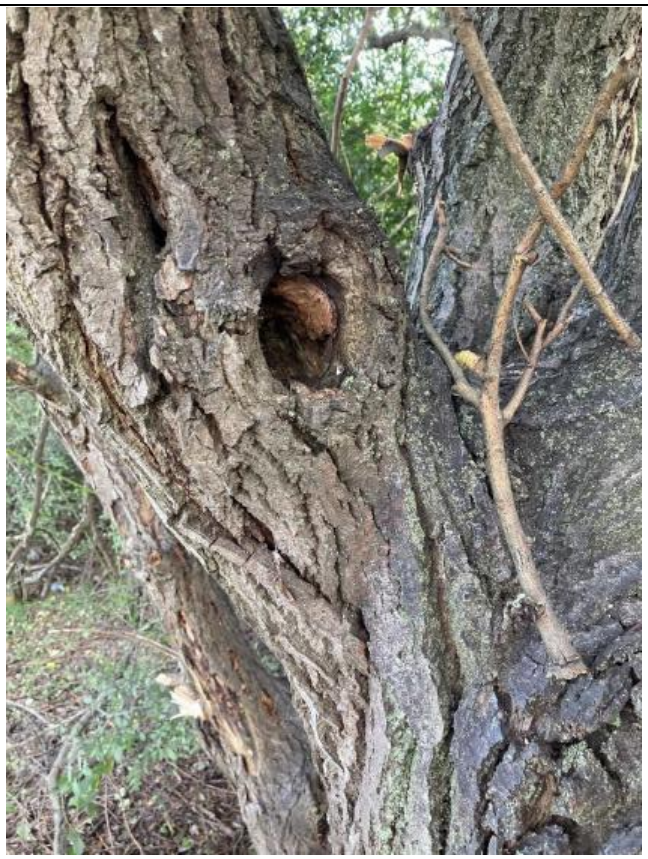
6.	Access road facing west. Dogwood, travellers joy, dog rose and bramble can be seen.	
7.	Dog rose and bramble are predominant around the periphery of the site.	

10.3 The Ash Stockpile

No.	Description	Image
1.	Pond 1: HSI below average.	
2.	Old bird nest found on site.	

3.	Bramble and hawthorn.	
4.	Active rabbit hole with fresh prints made after previous night's rainfall.	

5.	Area of meadow considered suitable reptile habitat.	
6.	Example of vegetation along trackway, hawthorn covered in traveller's joy. Long grasses considered suitable for reptile, hedgehog and GCN terrestrial habitat.	

7.	Example of PRF's in willow tree. This tree will be retained.	
8.	Kestrel on site.	

9.	Elder shrub with nettle ground layer.	
10.	Areas of unmanaged grassland north of site, connecting habitat with pond 1.	

11.	Rabbit and fox prints.	
12.	Areas of ephemeral vegetation, hawthorn shrub in background.	

13.	Spoil heaps covered in hogweed.	

10.4 Birds

No.	Description	Image
1.	Tufted Duck and Great Crested Grebe recorded on 12/05/2022	

2.	Tufted Duck recorded on 12/05/2022	

3.	Kestrel recorded on 13/10/2021	

10.5 Reptile

No.	Description	Image
1.	Grass snake recorded on 01/06/2022	

2.	Viviparous lizard recorded on 13/04/2022	

3.	Slow worms recorded on 26/05/2022	

11 APPENDIX

11.1 Additional Information for the Legislation of Protected Habitats and Species

Species Legislation

European protected species (EPS)

These animals are fully protected through inclusion within Schedule II of The Conservation of Habitats and Species Regulations 2010(as amended).

This legislation makes it an offence to deliberately capture, kill or disturb an EPS. For the purposes of this legislation disturbance has been defined by the European Commission (EC) and Natural England as that likely to significantly affect: i) the ability of a significant group of an EPS to survive, breed, rear or nurture their young or ii) the local distribution or abundance of the species (EC, 2007, Natural England, 2007). Further detail on what constitutes significant disturbance and significant groups in relation to most EPS can be obtained from these guidance documents.

It is also an offence under the Habitats Regulations 1994 (as amended) to damage or destroy and/or obstruct access to a breeding site or resting place of these species; please note the former is a strict liability offence. This legislation applies to all life stages of an EPS, including eggs. Former defences relating to actions being the incidental result of a lawful operation or taking place within a dwelling house no longer apply to offences under the Habitats Regulation 1994 for EPS.

EPS potentially present in the survey area:

- All bats within England and Wales.
- Great Crested Newt.

Bats

The primary legislative protection for bats is under the Habitats Regulations 1994 through designation as an EPS (see above). However, bats are also partially protected in England and Wales through their inclusion in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). It is an offence to intentionally or recklessly disturb a bat whilst it is using a place of rest or shelter. This applies to individuals, but is subject to a number of defences including if the disturbance was the 'incidental result of a lawful operation that could not reasonably have been avoided'. The legislation applies to all life stages.

Great crested newt

The primary legislative protection for GCNs is under the Habitats Regulations 1994 through designation as an EPS (see above). However, the GCN is also partially protected in England and Wales through its inclusion in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Under this legislation, it is an offence to intentionally or recklessly disturb a GCN whilst it is using a place of rest or shelter. This applies to individuals, but is subject to some defences including if the disturbance was the 'incidental result of a lawful operation that could not reasonably have been avoided'. The legislation applies to all life stages.

Breeding birds

All wild birds in England and Wales are protected under Section 1 of the Wildlife and Countryside Act, 1981 (as amended) which makes it an offence to intentionally kill, injure or take any wild bird, or take, damage or destroy the nest (whilst being built or in use) or its eggs. Species listed on Schedule 1 of The Act, e.g. kingfisher *Alcedo atthis*, receive further protection which makes it an offence to intentionally or recklessly disturb these species while building a nest, or in, on or near a nest containing eggs or young; or to disturb dependent young of such a bird. Further enhanced statutory protection is provided for bird species included on Annexe 1 of the Wild Birds Directive.

Badger

Badgers receive protection under the Protection of Badgers Act 1992 and the Wildlife and Countryside Act 1981 (as amended), under Schedule 6, Section 11. Under this legislation badgers receive protection from killing or taking by certain methods. It is also an offence to wilfully kill, injure, take or attempt to kill, injure or take a badger or interfere with a badger sett by damaging a sett or any part thereof. It is also an offence to wilfully destroy a sett, obstruct access to a sett or disturb a badger while occupying a sett. The 1992 Act defines a badger sett as “any structure or place, which displays signs indicating current use by a badger”.

Penalties for offences can be severe with fines of up to £5000, plus six months imprisonment for each illegal interference, badger death or injury. It is recognised however that there exists a range of certain legitimate activities which need to be conducted in spite of badger presence.

Other wildlife protection/control

The main legislation dealing with species protection/control at the national level is the Wildlife and Countryside Act 1981 (as amended). Plants listed under Schedule 8 and animals under Schedule 5 of the Act receive varying levels of protection. There are also measures to control the spread of non-native species contained in Schedule 9. Other relevant legislation may include the Protection of Badgers Act 1992 and the Wild Mammals (protection) Act 1996. Details of the protection/control afforded to the following species/groups considered of relevance to the survey area are given below.

Invasive plant species

Heracleum mantegazzianum giant hogweed, Fallopia japonica Japanese Knotweed and Impatiens glandulifera Indian Balsam are listed in Schedule 9, Part II of the Wildlife and Countryside Act 1981 (as amended) which makes it an offence to plant these species or otherwise cause them to grow in the wild. Any material containing Japanese knotweed or giant hogweed is also identified as ‘controlled waste’ under the Environment Protection Act 1990 and must be disposed of properly at landfill.

Rare and/or protected plants

Some plants are listed on Schedule 8 of the Wildlife and Countryside Act 1981 (as amended) which makes it an offence to intentionally pick, uproot, destroy or trade in these plants. Other plants appear on national red data lists, or are considered nationally, regionally or locally scarce, though these classifications do not confer any legal protection.

Other invertebrates

In England and Wales the Wildlife and Countryside Act 1981 (as amended) and The Conservation of Habitats and Species Regulations 2010 (as amended) offer legal protection to certain invertebrate species. Under the

aforementioned legislation, 17 invertebrate species in Britain have European protection and 45 species in England and Wales are fully protected at a national level.

Other Mammals

All non-domesticated mammal species including common species, such as rabbit Oryctolagus cuniculus and deer, receive protection under the Wild Mammals (Protection) Act 1996. This act protects wild mammals from certain cruel acts and makes it an offence to intentionally inflict unnecessary suffering on wild mammals.

Habitat Legislation Statutory Protected Sites & Features

Ramsar sites

Ramsar sites are designated under the Convention on Wetlands of International Importance, agreed in Ramsar, Iran, in 1971. Originally intended to protect sites of importance, especially as waterfowl habitat, the Convention has broadened its scope over the years to cover all aspects of wetland conservation and wise use, recognising wetlands as ecosystems that are extremely important for biodiversity conservation in general and for the well-being of human communities. They generally receive legal protection under the Wildlife and Countryside Act 1981 (as amended) as most UK Ramsar sites are also designated as SSSIs (see below). The majority are also SPAs (see below). Planning Policy Statement (PPS) 9 (see Section 2.3) also recommends that all Ramsar sites receive similar protection from development as Natura 2000 sites.

Special Areas of Conservation (SAC)

SACs receive full protection under the EC Habitats Directive (Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora). SACs are areas that have been identified as best representing the range and variety within the European Union of habitats and (non-bird) species listed on Annexes I and II of the Directive. SACs, together with Special Protection Areas (SPAs), form the Natura 2000 network. Natura 2000 sites are protected under The Conservation of Habitats and Species Regulations 2010(as amended) and any development likely to have significant impacts upon such a site will have to be assessed for its implications on the site's conservation status, an obligation under the aforementioned Regulations.

Special Protection Areas (SPAs)

SPAs receive full protection under the EC Birds Directive (Council Directive 79/409/EEC on the conservation of wild birds). SPAs are areas of the most important habitat for rare (listed on Annex I to the Directive) and migratory birds within the European Union. SPAs, together with SACs, form the Natura 2000 network. Natura 2000 sites are protected under The Conservation of Habitats and Species Regulations 2010(as amended) and any development likely to have significant impacts upon such a site will have to be assessed for its implications on the site's conservation status, an obligation under the aforementioned Regulations.

Sites of Special Scientific Interest (SSSIs)

SSSIs provide full statutory protection for the best examples of the UK's flora, fauna, geological, or physiographical features. Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs are now notified under the Wildlife and Countryside Act 1981 (as amended). Improved provisions for the protection and management of SSSIs were introduced by the Countryside and Rights of Way Act 2000. They are designated in England by Natural England who have powers to prevent damaging operations within and around the site. There is an obligation upon land owners and relevant authorities to notify Natural England if any activity they undertake may impact upon the conservation status of a SSSI.

National Nature Reserves (NNRs)

NNRs are fully protected from damaging operations within and around them under the National Parks and Access to the Countryside Act 1949 (as amended) and the Wildlife and Countryside Act 1981 (as amended). NNRs contain examples of nationally important natural and semi-natural terrestrial and coastal ecosystems in Great Britain.

Local Nature Reserves (LNRs)

LNRs are designated under the National Parks and Access to the Countryside Act 1949 (as amended) as areas of geological or wildlife interest of special local interest. They are normally owned and managed by local authorities, though increasingly local wildlife trusts are taking over this role. They can be protected from damaging operations within or around them through local bylaws or the policies of the local development framework.

Local Wildlife Sites (LWS) / Sites of Importance for Nature Conservation (SINC's)

SINCs/LWSs are identified by local planning authorities (in this case Durham County Council) on account of their value for wildlife. These receive a measure of protection through local planning policies.

Important hedgerows

The Hedgerows Regulations 1997 seek to protect 'important' hedgerows in the countryside by controlling their removal through a system of notification to the relevant local planning authority.

Tree Preservation Orders (TPOs)

TPOs give some measure of protection to individual trees, groups or trees or even entire woodlands that are considered by the Local Planning Authority (LPA) to be of value. They are protected under the Town and Country Planning Act 1990 and the Town and Country Planning (Trees) Regulations 1999. Trees subject to a TPO are protected from deliberate damage, and an application to the LPA would be necessary to remove any such tree.

11.2 Proposed Development Plan

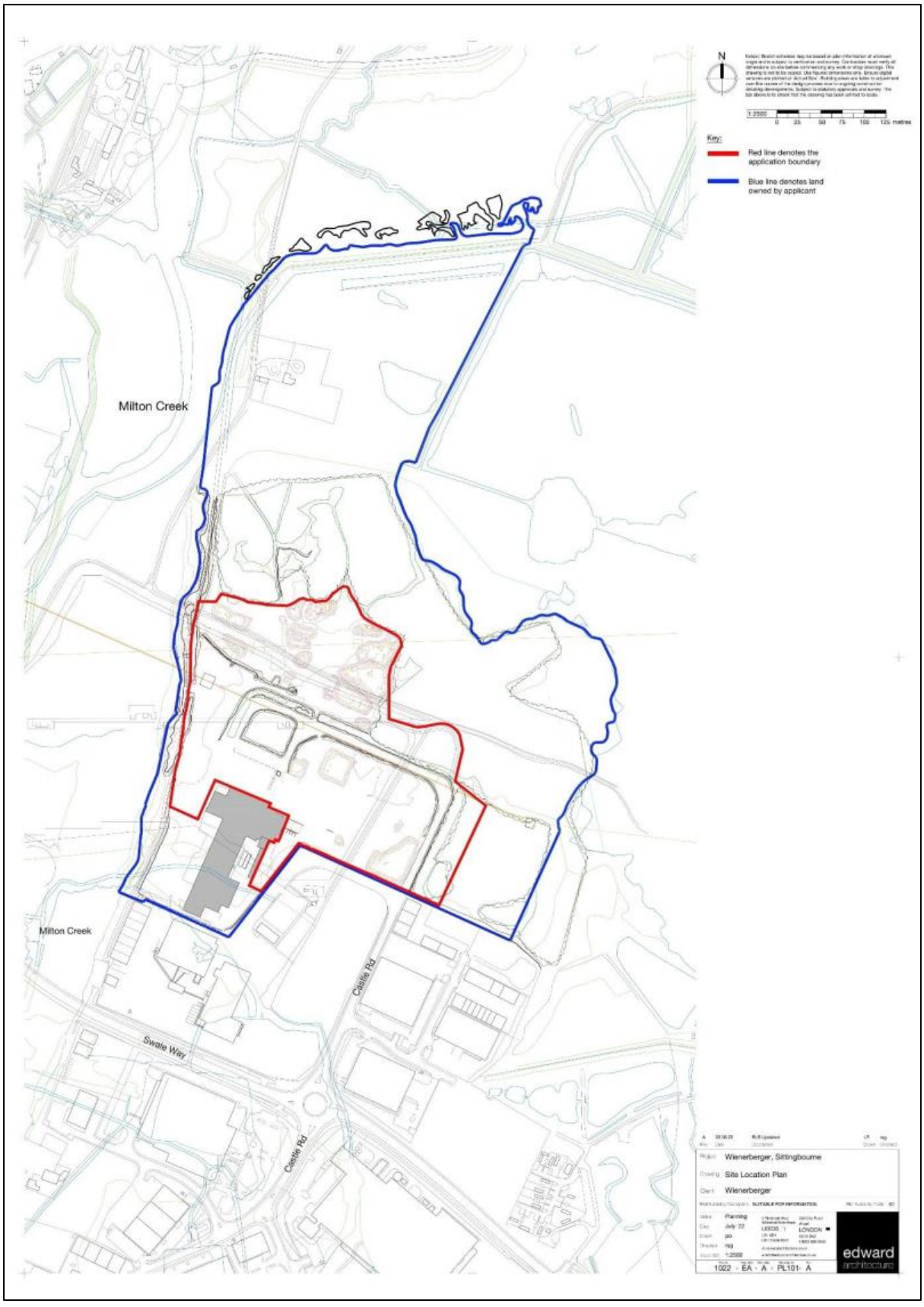


Figure 13: Site location plan.

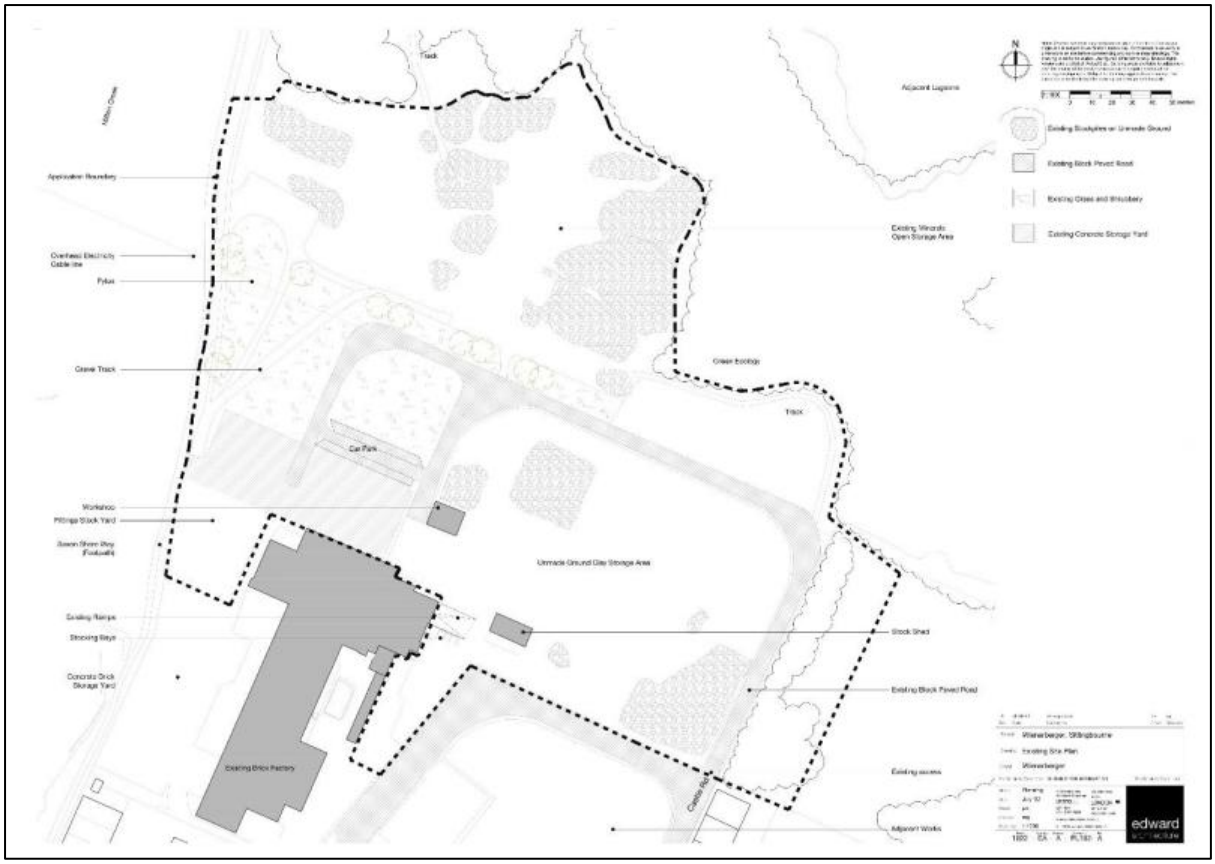


Figure 14: Existing site plan.

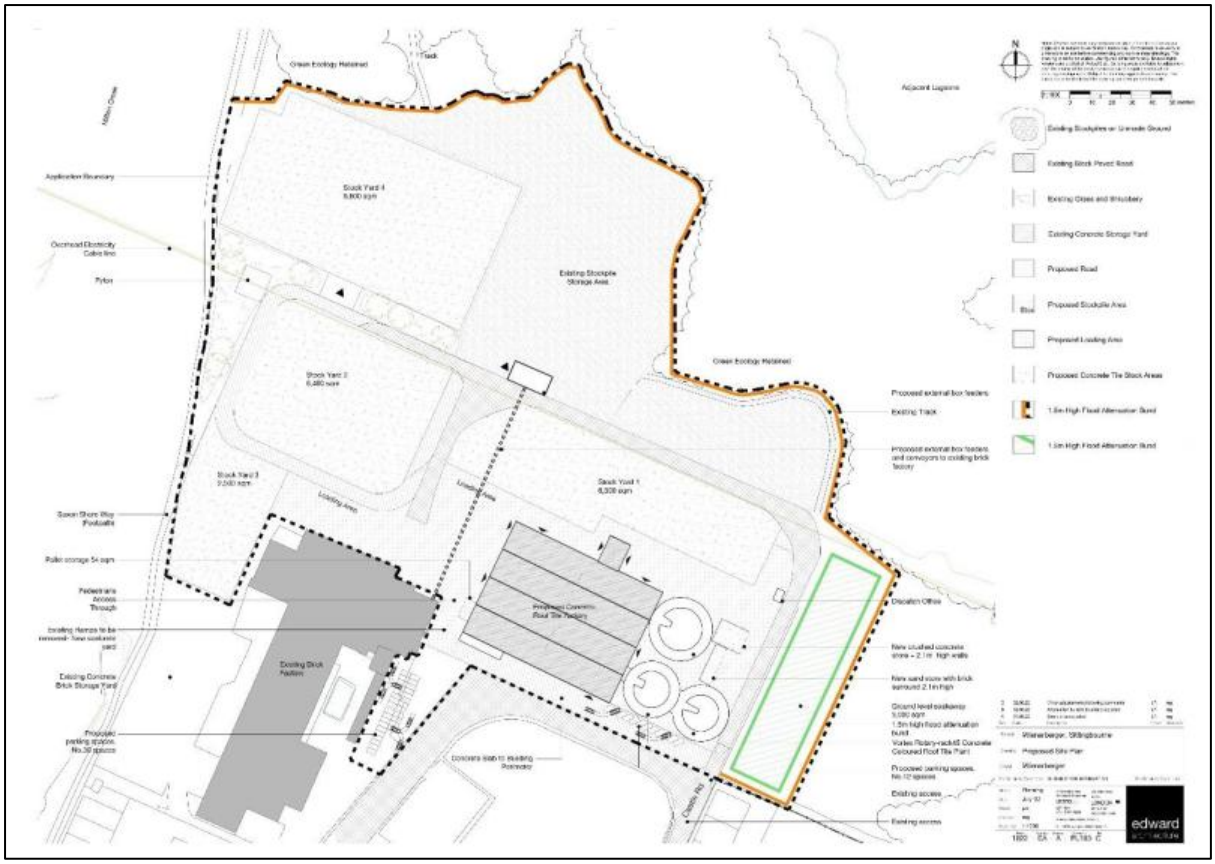


Figure 15: Proposed site plan.

11.3 Species List

Plant species list

Table 9: Plant List

Common name	Latin name
Birch	Betula sp.
Bitter fleabane	Erigeron acris
Blackthorn	Prunus spinosa
Bracken	Pteridium sp.
Bramble	Rubus fructicosus
Bristly oxtongue	Helminthotheca echioides
Butterflybush	Buddleja davidii
Chinque foil	Potentilla palustris
Common centaury	Centaurium erythraea
Common fleabane	Clematis vitalba
Common hogweed	Heracleum sphondylium
Common mallow	Malva sylvestris
Common mugwort	Artemisia vulgaris
Common reed	Phragmites australis
Dandelion	Taraxacum officinalis
Dog rose	Rosa canina
Dogwood	Cornus sanguinea
Elder	Sambucus nigra
Evening primrose	Oenothera biennis
German chamomile	Picris echioides
Goldenrod	Solidago sp
Hawthorn	Crataegus monogyna
Hemp agrimony	Eupatorium cannabinum
Horse raddishradis	Armoracia rusticana
Horse weed fleabane	Erigeron canadensis
Lesser burdock	Arctium minus
Mayweed	Anthemis cotula
Nettle	Urtica dioica
Perennial snowthistle	Sonchus arvensis
Ragwort	Senecio jacobaea
Red bartsia	Odontites vernus
Ribwort plantain	Plantago lanceolata
Rosebay willowherb	Chamerion angustifolium
Sea buckthorn	Hippophae rhamnoides
Spreading hedgeparsley	Torilis arvensis
Teasel	Dipsacus fullonum
Thistle	Cirsum sp.
Travellers joy	Clematis vitalba
Wild basil	Clinopodium vulgare
Wild privet	Ligustrum vulgare
Wild teasel	Dipsacus fullonum

11.4 HSI Scores

Pond 1: TQ92426587

Suitability Index		Value	Score
SI_1	Location	Zone A	1
SI_2	Pond Area	2900 sqm	Omit due to size
SI_3	Pond Drying	Never	0.9
SI_4	Water Quality	Poor (low invertebrate)	0.33
SI_5	Shade	10%	0.1
SI_6	Fowl	Minor	0.67
SI_7	Fish	Possible	0.67
SI_8	Ponds	0.95 ponds/ km sq	0.6
SI_9	Terrestrial Habitat	Good	1
SI_{10}	Macrophytes	0%	0.3
		Overall HSI Score:	**0.55**

H S I Score	Pond Suitability
<0.5	Poor
0.5-0.59	Below Average
0.6-0.69	Average
0.7-0.79	Good
>0.8	**Excellent**

11.5 Example Compensatory and Enhancement Features

Habibat Tree/Wall Mounted Nest Boxes

Habibat Wall/Tree Mounted Bat Boxes

017 External Access Box

Triple Chambered Access Box

Insect Hotels


example of insect hotels. (left; Cheshire Wildlife Trust, right; Scottish Wilflife Trust.

Reptile Hibernacula


Examples of brash pile and artificial hibernacula. (Left; ARG UK, Right; Ben Moore, Norfolk wildlife trust)

Artificial badger sett


Example of artificial badger sett. ECOSURV LTD.

12 CITATIONS

Ramsar Convention on Wetlands of International Importance
Especially as Waterfowl Habitat

The Swale extensions (Kent)

The Swale Ramsar site is a wetland of international importance comprising intertidal mudflats, shellbeaches, saltmarshes and extensive grazing marshes. It provides breeding and winter habitats for important assemblages of wetland bird species, particularly wildfowl and waders.

The proposed extensions to the Ramsar site include areas of intertidal mudflats and grazing marsh adjacent to the existing Swale Ramsar site and within The Swale Site of Special Scientific Interest. These areas are integral components of the complex of estuarine habitats composing the Swale.

The grazing marshes within the proposed extensions qualify under Criterion 2a of the Ramsar Convention by supporting a number of rare species of plants and animals. Nationally scarce plants include brackish water crowfoot *Ranunculus baudotii*, divided sedge *Carex divisa*, sea clover *Trifolium squamosum*, sea barley *Hordeum marinum* and soft hornwort *Ceratophyllum submersum*. Invertebrate records indicate that the grazing marshes support a rich wetland fauna, reflecting the complexity of habitats present. At least seven Red Data Book invertebrates have been recorded from Coldharbour, Iwade and Ridham Marshes, including an aquatic weevil *Bagous cylindrus*, a cranefly *Erioptera bivittata*, and a hoverfly *Lejops vittata*, listed as vulnerable; and a water bug *Micronecta minutissima*, a predatory rove beetle *Philothus punctus*, a small dolichopodid fly *Campsicnemus magius* and a small chloropid fly *Elachiptera rufifrons*, listed as rare. Four of these species have not been recorded elsewhere in the Swale. A large number of notable and scarce wetland invertebrates also occur within the proposed extensions.

The Swale qualifies under Criterion 3a by virtue of regularly supporting over 20,000 waterfowl, with an average peak count of 57,600 birds for the five winter period 1986/87 to 1990/91. The proposed extensions contribute to this total.

The Swale qualifies under Criterion 3c by supporting, in winter, internationally important populations of four species of migratory waterfowl; and nationally important populations of a further thirteen species. These include internationally important numbers of dark-bellied brent geese *Branta bernicla bernicla*; and nationally important numbers of dunlin *Calidris alpina*. In the five winter period 1986/87 to 1990/91 the average peak counts for these species were 2,850 dark-bellied brent geese (1.6% of the world population, 3.1% of the British wintering population). The mudflats of the proposed extensions support significant numbers of these species, with over 400 dark-bellied brent geese and 900 dunlin being recorded in recent years.

The mudflats of the proposed extensions also support smaller numbers of several other species of wintering migratory waterfowl, including oystercatcher *Haematopus ostralegus*, ringed plover *Charadrius hiaticula*, grey plover *Pluvialis squatarola*, curlew *Numenius arquata* and redshank *Tringa totanus*. These species occur in internationally or nationally important numbers within the Swale as a whole.

The grazing marshes of the proposed extensions support an assemblage of wintering species typical of the grazing marshes elsewhere within the Swale. These include shelduck *Tadorna tadorna*, wigeon *Anas penelope*, teal *Anas crecca* and curlew *Numenius arquata*, all of which present in internationally or nationally important numbers within the Swale as a whole.

During severe winter weather elsewhere, the Swale, including those areas within the proposed extensions, can assume even greater national and international importance as a cold weather refuge. Wildfowl and waders from many other areas arrive, attracted by the relatively mild climate, compared with continental European areas, and the abundant food resources available.

The Swale Ramsar site, including the proposed extensions, is part of the larger Thames estuary and contributes to its overall regional significance for birds in an international context.

Ramsar citation (Montreux 1990 Criteria)
LDS March 1993

EC Directive 79/409 on the Conservation of Wild Birds:
Special Protection Area

The Swale extensions (Kent)

The Swale Special Protection Area is a wetland of international importance, comprising intertidal mudflats, shellbeaches, saltmarshes and extensive grazing marshes. It provides habitats for important assemblages of wintering waterfowl, and also supports notable breeding bird populations.

The proposed extensions to the Swale SPA include areas of intertidal mudflats and grazing marshes adjacent to the existing site and within The Swale Site of Special Scientific Interest. These areas are integral components of the complex of estuarine habitats composing the Swale.

The Swale qualifies under Article 4.2 of the EC Birds Directive as a wetland of international importance by virtue of regularly supporting over 20,000 waterfowl, with an average peak count of 57,600 birds recorded in the five winter period 1986/87 to 1990/91. This total includes internationally or nationally important wintering populations of seventeen species of migratory waterfowl. Of these, two occur in significant numbers within the proposed extensions: dark-bellied brent geese *Branta bernicla bernicla* and dunlin *Calidris alpina*. In the five winter period 1986/87 to 1990/91, the average peak counts for the Swale as a whole were 2,850 dark-bellied brent geese (1.6% of the world population, 3.1% of the British wintering population) and 13,000 dunlin (3% of the British wintering population). The mudflats of the proposed extensions have, in recent years, supported over 400 dark-bellied brent geese and 900 dunlin.

The mudflats of the proposed extensions support smaller numbers of several other species of wintering migratory waterfowl, including oystercatcher *Haematopus ostralegus*, ringed plover *Charadrius hiaticula*, grey plover *Pluvialis squatarola*, curlew *Numenius arquata* and redshank *Tringa totanus*. These species are present in internationally or nationally important numbers within the Swale as a whole.

The Swale also qualifies under Article 4.2 by virtue of regularly supporting diverse assemblages of the wintering and breeding migratory waterfowl of lowland wet grassland and other estuarine habitats.

The grazing marshes of the proposed extensions support an assemblage of wintering species typical of the grazing marshes elsewhere within the Swale, including shelduck *Tadorna tadorna*, wigeon *Anas penelope*, teal *Anas crecca* and curlew *Numenius arquata*. These species are present in internationally or nationally important numbers within the Swale as a whole.

The grazing marshes also support a typical assemblage of breeding species, including shelduck *Tadorna tadorna*, mallard *Anas platyrhynchos*, moorhen *Gallinula chloropus*, coot *Fulica atra*, lapwing *Vanellus vanellus*, redshank *Tringa totanus*, reed warbler *Acrocephalus scirpaceus* and reed bunting *Emberiza schoeniclus*. Some of these species have restricted distributions in Britain because of habitat loss and degradation.

The grazing marshes of the proposed extensions also regularly support wintering, and occasionally breeding, short-eared owl *Asio flammeus* (a species listed under Annex 1 of the EC Birds Directive).

During severe winter weather elsewhere, the Swale, including those areas within the proposed extensions, can assume even greater national and international importance as a cold weather refuge. Wildfowl and waders from many other areas arrive, attracted by the relatively mild climate, compared with continental European areas, and the abundant food resources available.

The Swale SPA, including the proposed extensions, is part of the larger Thames estuary and contributes to its overall regional significance for birds in a European context.

SPA citation
LDS March 1993

COUNTY: KENT **SITE NAME:** THE SWALE

DISTRICT: CANTERBURY/SWALE

Status: Site of. Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981 as amended. Part of the site has been designated a National Nature Reserve under Section 16 of the National Parks and Access to the Countryside Act 1949 and part is a Local Nature Reserve under Section 21 of the National Park and Access to the Countryside Act 1949.

Local Planning Authorities: Canterbury City Council, Swale Borough Council

National Grid Reference: TR 000670 **Area:** 6568.45 (ha.) 16,230.58 (ac.)

Ordnance Survey Sheet 1:50,000: 178, 179 **1:10,000:** TQ 96, TQ 97 SE & SW, TR 06, TR 07 SE, SW, TR 16 NW

Date Notified (Under 1949 Act): 1968 **Date of Last Revision:** 1981

Date Notified (Under 1981 Act): 1984 **Date of Last Revision:** 1990

Other Information:
Parts of the site are listed in '*A Nature Conservation Review*' D A Ratcliffe (ed) CUP 1979. The Royal Society for the Protection of Birds manage part of the site as a nature reserve. The site has been extended to include Coldharbour and Ridham Marshes, and an additional part of the Oaze. Most of the site is also designated under the Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention) and as a Special Protection Area under European Community Directive 79/409 on the Conservation of Wild Birds.

Reasons for Notification:
The Swale includes the largest remaining areas of freshwater grazing marsh in Kent and is representative of the estuarine habitats found on the north Kent coast. The habitats comprise chiefly mudflats, saltmarsh, and freshwater grazing marsh, the latter being intersected by extensive dykes and fleets. The area is particularly notable for the internationally important numbers of wintering and passage wildfowl and waders, and there are also important breeding populations of a number of bird species. Associated wit the various constituent habitats of the site are outstanding assemblages of plants and invertebrates.

The mudflats of the Swale are extremely rich in invertebrates, over 350 species having been recorded. Some of these, such as the polychaete worm *Clymenella torquata* are known from nowhere else in Britain, while other more widespread species are present at high densities and provide food for the huge numbers of birds, especially waders, which use the Swale.

The saltmarshes are among the richest for plant life in Britain with for example particularly good representation of the saltmarsh-grasses *Puccinellia* and the glassworts *Salicornia*. Other abundant species include sea aster *Aster tripolium*, sea lavender *Limonium vulgare*, sea purslane *Halimione portulacoides* and common cord-grass *Spartina anglica* while less-common plants include small cord-grass *Spartina maritima** and golden samphire Inula *crithmoides**. As well as providing feeding and roosting places for many birds, the saltmarshes are of entomological interest; for example, this is the habitat of the scarce ground lackey moth *Malacostoma castrensis**.

Also on the seaward side of the sea walls are smaller areas of other habitats. The harder substrates of shingle below high water mark in places support large mussel beds, which in turn attract different birds from those of the mudflats, such as turnstone *Arenaria interpres*. There are several areas of shell, or shell sand beach, notably at Shellness on Sheppey and at Castle Coote west of Seasalter.

These have an interesting calcareous flora with plants characteristic of both sand ant shingle beaches: sea kale *Crambe maritima**, yellow horned-poppy *Glaucium flavum*, marram grass *Ammophila arenaria* and sea rocket *Cakile maritima* occur for example. Where undisturbed these beaches attract breeding ringed plover *Charidrius hiaticula* and little tern *Sterna albifrons*.

The grazing marsh complexes, including seawalls, counterwalls, fleets, dykes, temporary runnels, etc. provide suitable conditions for a wide range of plants and animals. The grassland habitats range from the damp muddy areas near the dykes, where characteristic plants include divided sedge *Carex divisa** and small goosefoot *Chenopodium botryodes** to the dry seawalls and counterwalls which support several less-common in addition to many widespread plants. These less-common plants include the specially-protected hogs fennel *Peucedanum officinale*** and least lettuce *Lactuca saligna***, slender hare's-ear *Bupleurum tenuissimum**, sea clover *Trifolium squamosum** and sea barley *Hordeum marinum**, all of which are more abundant in the Thames estuary than elsewhere in Britain. The more level grassland is dominated by a variety of grasses including foxtails *Alopecuris*, bents *Agrostis*, rye-grass *Lolium* and fescues *Festuca* with various herbs such as clovers *Trifolium*, and buttercups *Ranunculus* also present.

The flora of the dykes and fleets varies according to the salinity. Those nearest the sea tend to be most brackish, and generally have sea club-rush *Scirpus maritimus*, common reed *Phragmites australis* and fennel pondweed *Potamogeton pectinatus* as the most abundant species. In the fresher water further inland there is a greater variety of species and plants such as branched bur-reed *Sparganium erectum* and reed-mace *Typha latifolia* may become dominant. Plants associated with the dykes include beaked tasselweed *Ruppia maritima* and soft hornwort *Ceratophyllum submersum**. There is also a good invertebrate community with beetles, dragon and damsel-flies, and flies especially well represented.

Other less extensive habitats in the Swale include water-filled disused clay-pits, and small patches of scrub and woodland. These provide additional variety and interest to the site, and in some cases also support uncommon plants or animals.

The bird interest of the Swale is centred on the large numbers of waders and wildfowl which use the area in winter, and on autumn and spring migrations. Several species: wigeon *Anas penelope*, teal *Anas-crecca* and grey plover *Pluvialis squatarola* regularly overwinter in numbers of international importance+. Others, including shoveler *Anas clypeata*, knot *Caladris canutus*, dunlin *Caladris alpina* and spotted redshank *Tringa erythropus* are regularly present in winter in nationally significant numbers+.

Many of the birds use more than one habitat, some for example feed on the mudflats at low tide and then move up to roost on the saltmarsh or on fields inland of the sea wall.

The commoner breeding dry-land birds include skylark *Alauda arvensis*, meadow pipit *Anthus pratensis* and yellow wagtail *Motacilla flava*, and among the wetland birds mallard *Anas platyrhynchos*, shelduck *Tadorna tadorna*, coot *Fulica atra*, moorhen *Gallinula chloropus*, lapwing *Vanellus vanellus* and redshank *Tringa totanus*. Scarcer breeding birds include teal *Anas crecca*, gadwall *Anas strepera*, *Anas clypeata* and pochard *Athyia ferina*. Garganey *Anas quercedula*, pintail *Anas acuta*, ruff *Philomachus pugnax* and black-tailed godwit *Limosa limosa* have bred, or attempted to do so in recent years.

+ *Wildfowl and Wader Counts* 1987--88, D G Salmon et al, Wildfowl Trust 1988.

* Species regarded as 'scarce' in Britain (recorded from 16--100 of the 10 x 10km squares in Britain).

** Species recorded as 'rare' in Britain (recorded from 1--15 10 x 10km squares) and listed in *British Red Data Books: 1. vascular Plants*, 2nd Ed F H Perring & L Farrell, RSNC 1983.

13 ORDNANCE SURVEY MAP AND SATELLITE IMAGES

Ordnance Survey map and satellite images showing former use and current image (for information purposes).

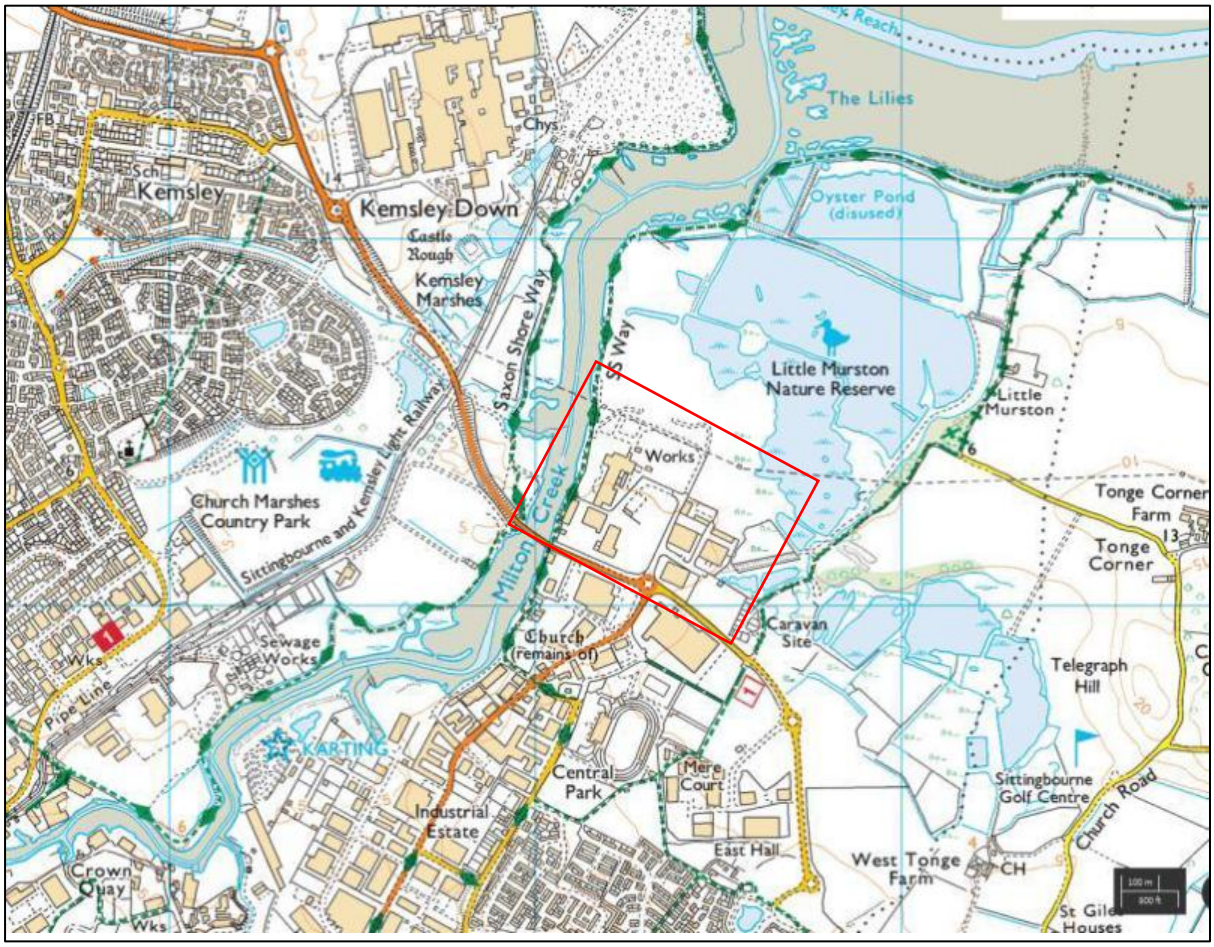


Figure 16: Ordnance Survey Map. Site within red boundary line.
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Figure 17: Smeed Dene 2015 development sites in red boxes

Figure 18: Smeed Dean 2003 development site in red box

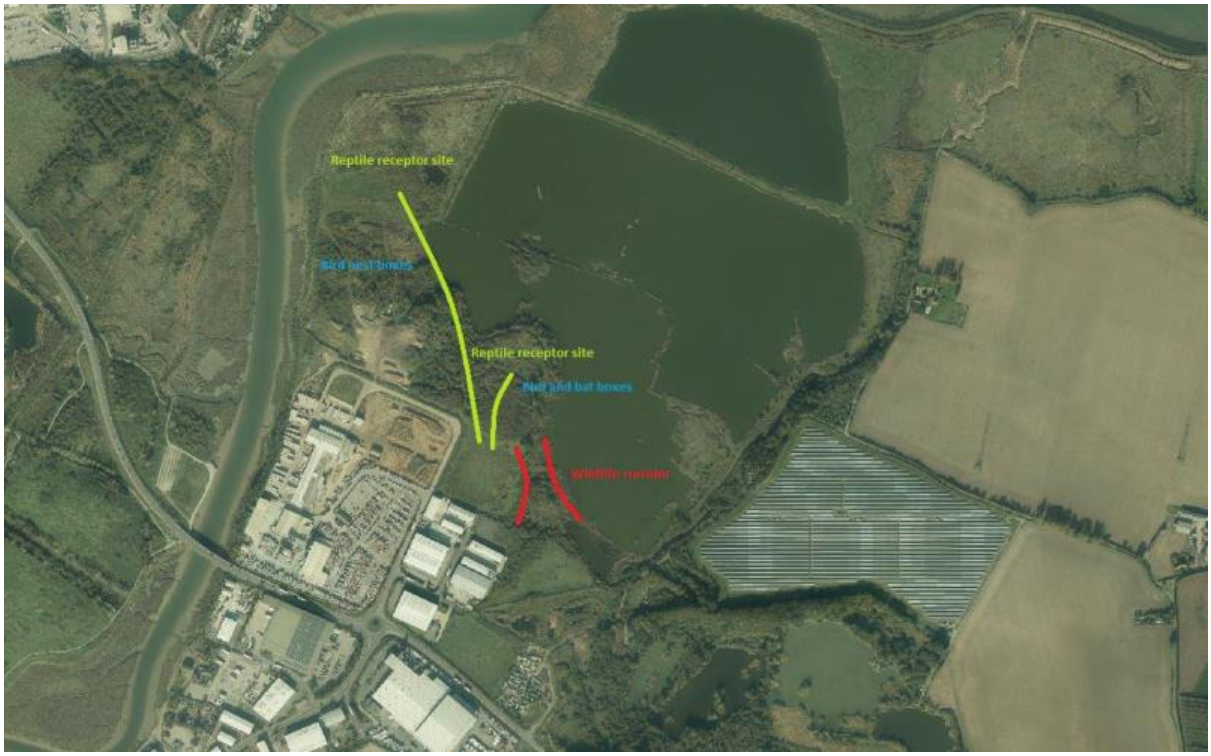

Figure 19: Proposed reptile receptor sites, and location for bird and bat boxes. The wildlife corridor to the southeast marked in red.

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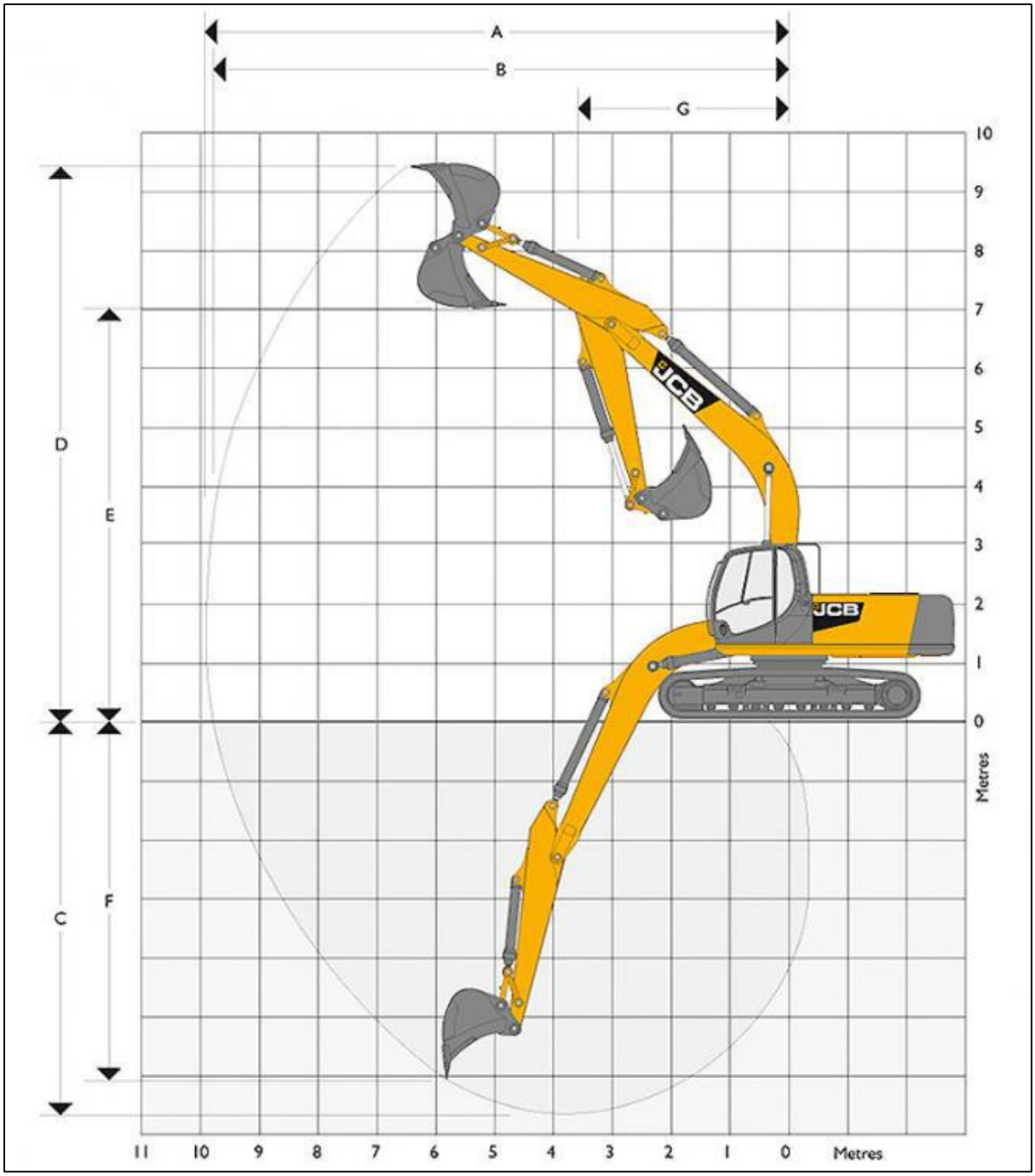

Figure 20: Example of dipper arm maximum height on a 22 tonne JS220 Tracked Excavator.