

11. ECOLOGY AND NATURE CONSERVATION

11.1 Introduction

This chapter of the ES assesses the likely significant effects of the Proposed Development in terms of Ecology and Nature Conservation.

The Chapter describes the assessment methodology; the baseline conditions currently existing at the Site and surroundings; the likely significant ecological effects; the mitigation measures required to prevent, reduce or offset any significant adverse effects; and the likely residual effects after these measures have been employed.

11.2 Scope of Assessment

The current assessment, including the structure of this chapter, has been adjusted in order to reflect more recently published guidelines for Ecological Impact Assessment in the United Kingdom which were issued by the Chartered Institute of Ecology and Environmental Management in 2018. The Proposed Development, when compared to the Consented Development, is very similar i.e. the working footprint is largely consistent with the Consented Development and only limited loss of natural habitat is proposed. Due to the length of time that has passed it was necessary to carry out updated survey i.e. an updated Preliminary Ecological Appraisal (PEA) followed by its recommended Phase II Surveys to inform the current assessment.

11.3 Assessment Methodology and Significance Criteria

11.3.1 Establishing a Baseline

11.3.1.1 Desk Study

Table 11.1 provides details of the Site and species records obtained to provide background information on ecological features in the vicinity of the Site. The local biological records centre referred to in **Table 11.1** was taken from the Northamptonshire Biodiversity Records Centre (NBRC). The relevant web-based data was accessed on 18th May 2018.

Table 11.1 Desk Study Details

Record Type	Search Radius (km) ¹	Source(s) ²
<i>Sites and Habitats</i>		
European statutory sites	15	Locations: Natural England GIS Digital Boundary Database: www.gis.naturalengland.org.uk/pubs/gis/tech_ds.htm
National statutory sites designated for bats and birds	10	Citations: Natural England Site Designations:

¹In each case the search included the Site and the specified distance beyond the Site boundary. Search radius was based on the professional judgement of the ecologist leading this appraisal with reference to the 2012 Preliminary Ecological Appraisal Guidelines produced by the Chartered Institute for Ecology and Environmental Management (CIEEM, Ref. 11.1).

²Natural England GIS Digital Boundary Database accessed on 18th May 2018 unless otherwise stated.

Record Type	Search Radius (km) ¹	Source(s) ²
National statutory sites	2	www.gov.uk/protected-or-designated-areas
Local wildlife sites designated for bats	2	Local biological records centre
Local wildlife sites, important hedgerows and veteran trees	0.5	Local biological records centre
Habitats of Principal Importance	0.5	Natural England GIS Digital Boundary Database: www.gis.naturalengland.org.uk/pubs/gis/tech_ds.htm
Ancient woodland	0.5	Natural England GIS Digital Boundary Database ¹ : www.gis.naturalengland.org.uk/pubs/gis/tech_ds.htm
Waterbodies	0.5	Ordnance Survey Street View Google Maps
<i>Species²</i>		
Bats, Otters and Water Voles	2	Local biological records centre Local bat group
Other Protected species ³	0.5	Local biological records centre
SPI and local BAP species	0.5	Local biological records centre ⁴

11.3.1.2 Field Survey

Extended Phase I Habitat Survey

An Extended Phase I Habitat Survey was undertaken on 9th April 2018 by an Assistant Ecologist from Keystone Ecology (Jack Howell, BSc (Hons)). Weather conditions at the time of survey were 16°C, 100% cloud cover and dry with a light breeze. The aim of the survey was to identify ecological features within or near the Site that could potentially pose a constraint to the Proposed Development and opportunities for incorporating biodiversity enhancement measures into the development proposals. In addition to Phase I Habitat mapping, each of the main habitats within the survey area

¹ Only ancient woodland sites that were over 2 ha on the 1920's base maps are included on the inventory.

² Records over 10 years old are excluded.

³ Birds only included if listed under the Wildlife & Countryside Act Sch 1. All species protected from sale only are excluded.

⁴ With reference to UK Biodiversity Action Reporting System if local BAP status is not indicated by information provided.

was described including details of component plant species abundances (recorded using the DAFOR scale. Incidental observations of protected and/or Species of Principal Importance (SPI) /local Biodiversity Action Plan (BAP species and the potential for such species to occur on-site (and in the surrounding landscape where relevant) were also noted; however, no specific protected/ SPI/local BAP species surveys were undertaken. The potential of the Site for foraging/commuting bats has been determined in accordance with Table 4.1 of Collins (2016, Ref. 11.2).

Full survey details can be found in **Appendix 11.1**.

Phase II Surveys

For methodologies applied to all Phase 2 surveys refer to the following appendix documents:

Appendices 11.2 to 11.5.

11.3.1.3 Consultation and Methodology for Assessing Impact to Weldon Park SSSI

Following review of air quality data, written text discussing the possible effects of acid deposition at Weldon Park SSSI has been produced by ERM and Lizi Robinson (MSc, MCIEEM), Keystone Ecology. This takes is included in section 11.8.1 and takes into account a verbal consultation between Keystone Ecology and John Minney, Natural England's responsible officer for this SSSI.

11.3.1.4 Determining Importance

The process of impact assessment applied in this chapter follows CIEEM guidance for Ecological Impact Assessment (Ref. 11.3). The process of assigning levels of geographical importance to ecological features follows the methodology defined in CIEEM. The value or potential value of an ecological resource or feature has been estimated on the following geographical scale:

- International and European;
- National;
- Regional;
- County or Metropolitan;
- Local or Parish; and
- Within Zone of Influence Only (i.e. the Site including boundary features).

Those resources that are assessed as being of negligible nature conservation value (i.e. not significant within the geographic scale defined above) are scoped out of the assessment and not considered further.

For designated sites, importance reflects the geographical context of the designation. Where a feature has value at more than one level, its overriding value is that of the highest level.

The value of areas of habitat and plant communities has been assessed against published selection criteria where available. BAPs have been searched to identify whether action has been taken to protect all areas of a particular habitat and to identify current factors causing loss and decline of particular habitats. Where the current baseline condition of a habitat is sub-optimal, its potential value is considered and vice versa, including its possible contribution to conservation objectives. The presence of injurious and legally controlled weeds has also been taken into account.

11.3.1.5 Importance Based on Biodiversity Attributes

When assigning a level of value to a species, its distribution and status, including a consideration of trends based on available historic records, have been taken into account. Other factors influencing the value of a species are legal protection, rarity and Species Action Plans (SAPs) (where they remain relevant). Guidance, where it is available, for the identification of populations of sufficient size for them to be considered of national or international importance has also been taken into account

For specific features associated with the site, the CIEEM guidance identifies various characteristics which are likely to be important in terms of biodiversity including:

- naturalness;
- animal or plant species, sub-species or varieties that are rare or uncommon, either internationally, nationally or more locally, including those that may be seasonally transient;
- ecosystems and their component parts, which provide the habitats required by important species, populations and/or assemblages;
- endemic species or locally distinct sub-populations of a species;
- habitats that are rare or common;
- habitats that are effectively irreplaceable;
- size of habitat or species population;
- habitat connectivity and/or synergistic associations;
- habitats and species in decline;
- rich assemblages of plants and animals;
- large populations of species or concentrations of species considered uncommon or threatened in a wider context;
- plant communities (and their associated animals) that are considered to be typical of valued natural/semi-natural vegetation types, including examples of naturally species poor communities; and
- species at the edge of their range, particularly where their distribution is changing as a result of global trends and climate change.

11.3.1.6 Assessment of Effects and Significant Criteria

An assessment of likely ecological impacts and the significance of their effects has been undertaken in accordance with CIEEM guidelines (Ref 11.3), only where clear evidence is available to substantiate and justify the findings. In the absence of such evidence, the precautionary principle has been applied and the effect included as significant in the absence of evidence to the contrary. Impacts have been assessed initially without mitigation in accordance with the approach adopted by CIEEM (Ref. 11.3).

Activities likely to generate effects on ecological receptors have been identified by considering the following:

- the design of the Proposed Development;
- desk study information;
- field survey information; and
- EIA experience and publications relating to similar projects/schemes.

Activities likely to generate effects were then broadly categorised into the following:

- construction of the Proposed Development;
- operation of the Proposed Development; and
- potential non-standard operations (e.g. one-off incidents and accidents).

The process of predicting ecological impacts takes into account the relevant aspects of ecosystem structure defined in Box 17 of CIEEM (Ref. 11.3).

When describing ecological impacts reference is made to the following characteristics that are relevant to understanding the ecological effect:

- positive or negative;
- extent;
- magnitude;
- duration;
- timing;
- frequency; and
- reversibility.

Once impacts have been characterised an assessment has been made to determine if the effects are significant and at what geographical scale. For the purpose of EclA 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general.

Significant effects encompass impacts on structure and function of defined sites, habitats or ecosystems and the conservation status of habitats and species (including extent, abundance and distribution). The scale of an effect may not be the same as the geographical context in which the feature is considered important. For example, an effect on a species which is of national importance may not have an effect on its national population.

The evaluation of significant effects is based on the best available scientific evidence. Where it is not possible to robustly justify a conclusion of no significant effect, a significant effect is assumed, and any uncertainty is acknowledged.

11.3.1.7 Mitigation and/or Compensation Measures and Residual Effects

Suitable measures are identified to:

- avoid adverse ecological effects;
- reduce adverse ecological effects that cannot be avoided;
- provide compensation to off-set effects; and
- deliver ecological enhancements.

Residual effects are assessed using the same approach and criteria as the assessment of unmitigated impacts.

11.3.1.8 Nomenclature

The English names of flora and fauna species are given in the main text of this report. Scientific names are used only in the absence of English names. Vascular plants and Charophytes follow the nomenclature of The Botanical Society for the British Isles database (2007) with all other flora and fauna following the UK Species Inventory (Natural History Museum, 2016, Ref 11.4).

11.4 Legislation, Planning Policy and Guidance

11.4.1 Relevant Legislation

This section sets out the wildlife legislation and policy relevant to the proposed development. Please note that this legal information is a summary and intended for general guidance only. The original legal documents should be consulted for definitive information. Legislation pertaining to protected sites and species is provided in **Table 11.2** and **Table 11.3** below.

Table 11.2 Relevant Legislation Protection Afforded to Sites/Habitats

Designated Site/Habitat	Legal Status
SSSI (Sites of Special Scientific Interest)	SSSIs are the national suite of sites providing statutory protection for the best examples of the UK's flora, fauna, or geological or physiographical features. Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs have been renotified 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.
LNR (Local Nature Reserves)	Under the National Parks and Access to the Countryside Act 1949, LNRs may be declared for nature conservation by local authorities after consultation with the relevant statutory nature conservation agency. Legal protection of LNRs is provided under The Wildlife and Countryside Act 1981 (as amended).

Table 11.3 Relevant Legislation Protection Afforded to Species

Species	Legal Status
<i>European Protected</i>	
Great Crested Newts, Bats, Otter	<p>These animal species and their breeding sites or resting places are protected under Regulation 41 of the Conservation of Habitats and Species Regulations 2010 (as amended), which makes it illegal to:</p> <p>Deliberately capture, injure or kill any such animal or to deliberately take or destroy their eggs;</p> <p>Deliberately disturb such an animal (under the Conservation Regulations disturbance of protected animals includes, in particular, any disturbance which is likely to impair their ability to survive, breed or reproduce, or to rear or nurture their young or to hibernate or migrate and/or significantly affect the local distribution or abundance of the species in question);</p> <p>Damage or destroy a breeding site or resting place of such an animal.</p> <p>European Protected Species (EPS) licences can be granted by Natural England in respect of development to permit activities that would otherwise be unlawful under the Conservation Regulations, providing that the following 3 tests (set out in the EC Habitats Directive) are passed:</p> <ul style="list-style-type: none"> ■ The development is for reasons of overriding public interest; ■ There is no satisfactory alternative; and ■ The favourable conservation status of the species concerned will be maintained and/or enhanced. <p>Under Regulation 9(5) of the Conservation Regulations, Planning Authorities have a legal duty to 'have regard to the requirements of the EC Habitats Directive in the exercise of their functions'. This means that they must consider the above 3 tests when determining whether Planning Permission should be granted for developments likely to cause an offence under the Conservation Regulations. As a consequence, Planning Applications for such developments must demonstrate that the 3 tests will be passed.</p>
<i>Nationally Protected</i>	

Species	Legal Status
Great Crested Newts, Bats, Water Vole	<p>These animals receive full protection under the Wildlife and Countryside Act 1981 (as amended by the Countryside and Rights of Way Act 2000), which makes it illegal (subject to exceptions) to:</p> <p>Intentionally kill, injure or take any such animal;</p> <p>Intentionally or recklessly damage, destroy or obstruct any place used for shelter or protection by any such animal;</p> <p>Intentionally or recklessly disturb such animals while they occupy a place used for shelter or protection.</p>
Common Lizard, Grass Snake, Slow-worm, White-Clawed Crayfish	<p>These animals receive limited protection under The Wildlife and Countryside Act 1981 (as amended by the Countryside and Rights of Way Act 2000), which makes it illegal to intentionally kill or injure any such animal.</p> <p>In addition, it is an offence to intentionally take White Clawed-crayfish from the wild.</p>
Nesting Birds (general)	<p>All wild birds are protected under the Wildlife and Countryside Act 1981 (as amended by the Countryside and Rights of Way Act 2000), which makes it illegal (subject to exceptions) to:</p> <p>Intentionally kill, injure or take any wild bird;</p> <p>Take, damage or destroy the nest (whilst being built or in use) or eggs of any wild bird.</p>
Badgers	<p>The Protection of Badgers Act 1992 makes it illegal to wilfully kill or injure a Badger, or attempt to do so and also make it illegal to intentionally or recklessly interfere with a Badger sett. This includes damaging or destroying a sett, obstructing access to a sett and disturbing a Badger while it is occupying a sett. Licences can be granted to permit sett closure and/or disturbance between July and November inclusive.</p>
Wild Mammals	<p>The Wild Mammals (Protection) Act 1996 makes it illegal to mutilate, kick, beat, nail, or otherwise impale, stab, burn, stone, drown, crush, drag or asphyxiate any wild mammal with intent to inflict unnecessary suffering.</p>

Section 40 of the Natural Environment and Rural Communities Act 2006 (the NERC Act) places a legal duty on public bodies, including planning authorities, to 'have regard' to the conservation of biodiversity when carrying out their normal functions, which includes consideration of planning applications.

In compliance with Section 41 of the NERC Act, the Secretary of State has published a list of species and habitats considered to be of principal importance for conserving biodiversity in England under the UK Post-2010 Biodiversity Framework. This is referred to as the list of Species/Habitats of Principal Importance in England, of which there are 56 habitats (HPI) and 943 species (SPI). The list is used to guide planning authorities in implementing their duty under the NERC Act.

11.4.2 National Planning Policy

The National Planning Policy Framework (NPPF, Ref 11.5) sets out the Government's planning policies for England and how these are expected to be applied. At the heart of the NPPF is a presumption in favour of sustainable development. This presumption does not apply where development requiring Appropriate Assessment under the Birds or Habitats Directives is being considered, planned or determined.

The NPPF states that, "When determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the following principles:

- if significant harm 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;
- proposed development on land within or outside a Site of Special Scientific Interest (SSSI) likely to have an adverse effect on a SSSI (either individually or in combination with other developments) should not normally be permitted. Where an adverse effect on the site's notified special interest features is likely, an exception should only be made where the benefits of the development, at this site, clearly outweigh both the impacts that it is likely to have on the features of the site that make it of special scientific interest and any broader impacts on the national network of SSSIs;
- development proposals where the primary objective is to conserve or enhance biodiversity should be permitted;
- opportunities to incorporate biodiversity in and around developments should be encouraged;
- planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless there are wholly exceptional reasons. For example, infrastructure projects where the public benefit would clearly outweigh the loss or deterioration of a habitat. In situations such as these a suitable compensation strategy must exist; and
- the following wildlife sites should be given the same protection as European sites: potential Special Protection Areas (SPA) and possible Special Areas of Conservation (SAC); listed or proposed Ramsar sites; and sites identified, or required, as compensatory measures for adverse effects on European sites, potential SPAs, possible SACs, and listed or proposed Ramsar sites.”

Under the NPPF, the Planning Authority has a responsibility to promote the preservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species populations, linked to national and local targets, and identify suitable indicators for monitoring biodiversity in the plan.

Also, under the NPPF the planning system should contribute to and enhance the natural and local environment by minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures.

11.4.3 Local Planning Policy

11.4.3.1 North Northamptonshire Minerals & Waste Local Plan (2017)

Northamptonshire's Mineral and Waste Local Plan (2017, Ref 11.7) also has objectives for protecting and enhancing the natural environment including landscaping, habitats and species. Objective 10 in this document recognises the importance of conserving and enhancing the built and natural environment through sensitive working, and where necessary, high standards of mitigation to address adverse impacts of minerals and waste development. Developments in Northamptonshire must not damage or destroy the county's natural assets and, where possible, efforts to enhance existing and planned green infrastructure networks should be sought.

11.4.3.2 Part 1 Local Plan: North Northamptonshire Joint Core Strategy (2016)

North Northamptonshire Joint Core Strategy (adopted 2011 and extending to 2031, Ref 11.6) acknowledges that the local area has a low biodiversity offer, with habitats already fragmented or degraded as a result of development and agriculture. Relevant policies relating to biodiversity include:

- Policy 4: Biodiversity: This policy seeks the protection of existing biodiversity assets and assets off-site which could be affected by adverse effects of noise, air and light pollution. A net gain for

biodiversity should be sought and any impact to an asset should firstly be avoided and if this is not possible mitigated for and as a last resort compensated.

- Policy 6: Development on Brownfield Land: This policy welcomes the delivery of development through the reuse of previously developed land.
- Policy 19: The Delivery of Green Infrastructure: This policy does not permit development that would compromise the integrity of the overall green infrastructure network in the locality.

11.5 Baseline Conditions

11.5.1 Introduction

The Site continues to be used for car storage with the majority of the Site comprising hardstanding and compacted gravel. Although tall ruderal and scrub has started to colonise the poor semi-improved grassland in places, overall, there is very little change to habitat arrangement on Site from 2016. All habitats on Site continue to be of negligible botanical value.

For clarity, baseline conditions are set out within separate on and off-site sections below and a summary table is also provided. It should be noted that in spite of the renewed approach i.e. taking into account current standards and guidelines, similar conclusions are drawn with respect to all potential ecological receptors (both on and off-site) which were considered in 2016, Where ecological receptors are new considerations this is stated clearly in **Table 11.4** below.

11.5.2 Relevant Previous Reports

The following reports are relevant to this Chapter and are contained in Appendices as follows:

- Preliminary Ecological Appraisal – **Appendix 11.1**
- Badger Survey Report (Confidential) – **Appendix 11.2**
- eDNA Great Crested Newt Survey Report – **Appendix 11.3**
- Otter and Water Vole Survey Report – **Appendix 11.4**
- White-Clawed Crayfish Scoping Survey Report – **Appendix 11.5**

11.5.3 Summary of Relevant or Potentially Relevant Ecological Resources/Features and Geographical Level of Importance

A summary of baseline conditions listing all relevant ecological resources/features and their corresponding geographical level of importance is presented in **Table 11.4**. One statutory and one non-statutory site have been scoped into the baseline assessment, the former by the air quality consultants as models predicted Process Contribution from the Proposed Development being marginally above the Environment Agency 1% of Critical Level for acid deposition criterion. The latter was scoped in as part of the PEA and all other statutory and non-statutory sites were scoped out, also as part of the PEA (refer to **Appendix 11.1**).

Table 11.4 Relevant Ecological Resources/Features and Geographical Level of Importance

Resource /Feature	Brief Description	Level of Importance	Change to Previous Baseline / Additional Consideration
Statutory Sites			
Weldon Park SSSI	This SSSI, situated approximately 3.25km to the east, is one of the largest intact ancient	Regional, due to degraded	Updated baseline / assessment required

Resource /Feature	Brief Description	Level of Importance	Change to Previous Baseline / Additional Consideration
	woodlands in the county. Since 2010 this site has been in an 'unfavourable recovering' condition due to deer affecting its regeneration.	condition	

Non-statutory Sites

Unnamed pLWS*	<p>The pLWS, running parallel with the northern site boundary is associated with the former Tata Steelworks and supports a matrix of habitats, including deciduous woodland, scrub, grassland, and the Northern Stream which runs near to its southern margin. Waterbodies are also present. The site is unmanaged with large volumes of fly tipped waste present.</p> <p>Broadleaved woodland within the pLWS qualifies as the HPI Lowland Mixed Deciduous Woodland.</p> <p>Standing water within this pLWS qualifies as the HPI Ponds due to the confirmed presence of GCN**.</p> <p>The Northern Stream does not support protected species and is of moderate quality . The brook does not appear to have any qualifying features for the HPI Rivers and Streams**.</p>	Local	Updated baseline / assessment required
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*Potential Local Wildlife Site

** refer to species section below. Habitat value can increase when known to support protected species.

Habitats – On-site

Poor Semi-improved Grassland	<p>A strip of grassland runs along the northern edge of the site. The grassland band is approximately 5 metres wide and located on a bank which grades down into a narrow band of ephemeral/short perennial habitat where the substrate becomes compacted rubble adjacent to tarmac.</p> <p>This habitat is of value to protected wildlife including birds, reptiles and GCN when grassland falls within 500 m of known/historic GCN populations.*</p>	Botanically negligible	No material change to 2016 ES baseline.
Scrub – scattered	<p>Small pockets of scattered scrub are present.</p> <p>This habitat is of value to protected wildlife including birds, reptiles, and GCN when grassland falls within 500 m of known/historic GCN populations.*</p>	Botanically Negligible	No material change to 2016 ES baseline.
Tall Ruderal Vegetation	<p>Small areas of ruderal vegetation are present along the northern boundary.</p> <p>This habitat is of value to protected wildlife including birds, reptiles and GCN when this habitat type falls within 500 m of known/historic GCN populations.*</p>	Botanically negligible	No material change to 2016 ES baseline.
Line of	A line of immature broadleaved trees, in good	Botanically	No material change

Resource /Feature	Brief Description	Level of Importance	Change to Previous Baseline / Additional Consideration
Trees	condition, delineates the eastern site boundary.*	Negligible	to 2016 ES baseline.
* refer to species section below. Habitat value can increase when known to support protected species.			
Species – On-site			
Great Crested Newts	eDNA survey confirmed GCN in Waterbodies 1 and 2, within the pLWS to the immediate north of the Site. The closest waterbody is 90 metres distant with no major barrier to dispersal. Suitable GCN habitat on-site is restricted to the bands of natural vegetation i.e. grassland, scattered scrub, tall ruderal vegetation and tree line along the northern and eastern boundaries. The hardstanding and ephemeral/perennial growing within heavily disturbed and compacted gravel, offers no refuge opportunities to GCN and as the land to the south of the Site is heavily urbanised, it is unlikely GCN would commute across this land as no suitable resting places or breeding opportunities are present. Small, medium and large populations of GCN are known in the vicinity of the Corby Northern Orbital Road, to the north of Site.	Local	Updated baseline / assessment required
Common Toad	Common Toad, a SPI, was identified in the desk study search, the closest record being 184 metres to the north. The Site does not support aquatic habitat which could support breeding Common Toad however, small areas of natural vegetation along the northern and eastern boundaries of the Site could provide resting places and foraging opportunity for this species although none have been observed to date.	Zone of Influence	New consideration.
Bats – Commuting and Foraging	Within the Site itself, foraging/commuting habitat is largely restricted to the northern and eastern fringes where vegetation is present however, the car park could also be used for foraging by opportunistic bats. On-site lighting columns will affect species assemblage as many species are intolerant to artificial lighting (Ref 11.12). Common bats including Common and Soprano Pipistrelle are most likely to use the Site as they are known to congregate around lighting and feed on the insects which are attracted to them. Although identified in desk study searches, Barbastelle and Daubenton's are unlikely to use the Site as they are intolerant to artificial lighting.	Local Value	Updated baseline / assessment required
Breeding Birds	The scrub and trees within natural habitats at the northern and eastern edges of the Site provide suitable habitat for a range of common and widespread passerine species.	Zone of Influence	Updated baseline / assessment required
Reptiles	The desk study identified a single record of Common Lizard within 500 metres of the Site. Grassland, scrub and tall ruderal vegetation along the Site's northern boundary could support this	If present, Zone of Influence	Updated baseline / assessment required

Resource /Feature	Brief Description	Level of Importance	Change to Previous Baseline / Additional Consideration
	<p>species, in addition to other common reptiles, including Grass Snake and Slow Worm. The Site's edge habitats are well connected to a wealth of suitable habitat within the pLWS increasing the likelihood of their use by foraging reptiles.</p> <p>The majority of the Site is of very limited value to foraging reptiles and refuge opportunities are limited to a single brush pile along the eastern boundary.</p> <p>Common Lizard and Slow Worm are scarce in the locality and given the small areas of available suitable habitat on-site it is highly unlikely substantial populations of either species could be supported.</p> <p>Grass Snake are common in the locality and for the same reasons explained for Common Lizard and Slow Worm, if present, the Site could only support them at low densities.</p>		
Dormouse	<p>On site trees are immature and the tree composition and understory is sub-optimal for Dormouse. However, canopy cover along the eastern boundary is continuous with woodland within the pLWS and, although unlikely, presence cannot be ruled out. The adjacent pLWS measures approximately 11 hectares and assuming presence of optimal habitat i.e. diverse deciduous woodland with abundant scrub and understory this site could support between 4 and 10 individuals per hectare. Records of Dormice are frequently occurring in the locality, particularly to the east of Corby (NBN, 2018, Ref 11.8).</p>	If present in the pLWS, Local	New consideration.
Species – Off-Site			
Badgers	<p>No setts are present on or within 30 metres of the site. There is no sign of digging attempts beneath fencing surrounding the site indicating Badger do not currently use the Site as a foraging resource.</p> <p>Extensive Badger evidence is present within the pLWS to the north with at least 5 setts observed historically.</p>	Zone of Influence	Updated baseline / assessment required
Bats - Roosting	<p>There are no features on-site which could support roosting bats. Woodland within the pLWS to the immediate north could support roosting bats although trees at the woodland's edge are subject to illumination and any bats present would be habituated to this as well as noise during both the</p>	Local Value	New consideration.

Resource /Feature	Brief Description	Level of Importance	Change to Previous Baseline / Additional Consideration
	day and night. Crevice dwelling bats, roosting in trees, are highly transient and often occupy roost features sporadically or opportunistically throughout the year. Occupation of tree roosts within 30 metres of the Site's northern boundary is most likely to be by Common or Soprano Pipistrelle bats roosting in low numbers.		
Otter	No signs of Otter were identified during the survey. Survey evidence indicates likely absence of Otter from the Northern Stream. Although Otter are frequently occurring along the main watercourses to the north and south of Corby and could colonise the Northern Stream in the future. The woodland slopes steeply away to the Northern Stream and it is >90 metres distant no operational effects on future Otter use along this watercourse is expected.	Negligible	Updated baseline / assessment required
Water Vole	No Water Vole signs were recorded along the Northern Stream and survey evidence indicates likely absence of Water Vole with negligible potential for future colonisation.	Negligible	Updated baseline / assessment required
White-clawed Crayfish	The Northern Stream is suboptimal for occupation by White-Clawed Crayfish and survey identified numerous contra-indicators to crayfish presence. Given the nature of the watercourse, and the fact that White-Clawed Crayfish do not make extensive movements, it is highly likely that this species is currently absent from the Northern Stream and there is no means for future colonisation.	Negligible	New consideration

11.5.4 General Site Characteristics (No material change to the 2016 ES)

The Site is located along the eastern perimeter of the Willowbrook Industrial Estate, Corby and comprises a large car storage area surfaced with tarmac and bands of compacted gravel with a narrow band of poor semi-improved grassland with colonising ephemeral species, scrub and tall ruderal vegetation in the north of the Site. Scrub and a line of trees are present along the eastern boundary.

Large car storage areas lie west of the Site with numerous steel clad industrial units located to the south. Rockingham race track lies approximately 350 metres to the north of the Site, with a mosaic of scrub, bare ground and deciduous woodland located in between and designated as a potential Local Wildlife Site (pLWS). Northern Stream runs through the pLWS, in parallel to the Site at a distance of approximately 30 metres. Shelton Road runs to the east of the Site.

11.5.5 Weldon Wood SSSI (Updated baseline)

Weldon Wood SSSI situated approximately 3.25km to the east of Site crossing industrial and residential areas. The SSSI is one of the largest intact ancient woodlands in the county and

comprises semi-natural vegetation developed on Boulder clay with Ash-Maple and Hazel-Ash canopy types recorded. Since 2010 the SSSI has been in an 'unfavourable recovering' condition due to deer affecting the regeneration of the woodland.

The SSSI has a rich botanical assemblage and is of value to nesting birds and invertebrates.

11.5.6 Nene Valley Nature Improvement Area / Green Infrastructure Network/pLWS – Off-Site Ecological Receptor

The Site is directly connected to habitats within the pLWS to the north and undeveloped land to the east of Shelton Road and therefore, natural and, in particular, linear habitat types on-site contribute to the wider green infrastructure resource. The amount of natural habitat in the vicinity of the Site is heavily constrained by development i.e. Corby Northern Orbital Road, the Rockingham Speedway and several large industrial estates and, therefore, on-site green infrastructure is valuable within such an urban setting.

The Site forms part of the Nene Valley Nature Improvement Area (NIA) although it, in itself, is an actively used car park set in a built-up environment. Nene Valley NIA covers an area of 41,000 hectares through the centre of Northamptonshire and overlaps the Site. Including the River Nene and 5 of its tributaries, it is centred on the Upper Nene Valley Gravel Pits SPA, designated for wintering wildfowl. The Nene Valley supports a vast diversity of species in a variety of habitats including reservoirs, wildflower meadows, wet woodland, grazing marshes and urban areas. The NIA seeks to deliver a net gain in biodiversity by 2020 through growth and development, improving the ecological status of the river, enhancing the ecological service provision and enhancing public awareness and benefits of the area in a sustainable way.

11.5.7 On-site Habitats and Flora (No material change to the 2016 ES)

The following habitats were identified on-site during the course of the field surveys as shown in **Appendix 11.1**:

- Hardstanding;
- Ephemeral/Short Perennial;
- Poor Semi-Improved Grassland;
- Scattered Scrub;
- Tall Ruderal; and
- Line of Trees.

All habitat types described below have negligible botanical value in their own right, however, habitat value can increase when known to support protected species as shown in **Table 11.4** above.

11.5.7.1 Hardstanding

The site is actively used to store vehicles and is dominated by linear strips of tarmac. Similar habitat extends to the west where a much larger car forecourt exists. Large bands of compacted gravel are present between the bands of hard standing.

11.5.7.2 Ephemeral/Short Perennial

The compacted gravel bands, between the tarmac roads, support a sparse ephemeral/short perennial community. This habitat is dominated by low-lying Chickweed and moss spp., with occasional Daisy, Hawkweed spp., Scentless Mayweed, Colt's Foot, Yorkshire Fog and Cock's Foot. Herb Robert, Groundsel and Fescue sp. occur rarely.

Ephemeral vegetation is also present within a small spoil heap located along the eastern boundary. Additional species within this habitat include occasional Rosebay Willowherb, Bristly Ox-tongue,

Mugwort, Common Nettle, Cleavers, Curled Dock and Creeping Thistle. White Dead-nettle, Creeping Buttercup, Greater Stitchwort and Ox-eye Daisy occur rarely.

11.5.7.3 Poor Semi-Improved Grassland

A strip of grassland runs along the northern edge of the Site. The grassland band is approximately 5 metres wide and located on a bank which grades down into a narrow band of ephemeral/short perennial habitat where the substrate becomes compacted rubble adjacent to tarmac.

The grassland sward is dense and dominated by abundant Perennial Rye Grass, Yorkshire Fog, Cock's Foot and Common Bent interspersed with frequent Common Vetch, Bristly Ox-tongue, Colt's Foot and Ribwort Plantain. Ox-eye Daisy, Common Nettle, Mare's Tail and Meadow Vetchling are also frequent. Creeping Cinquefoil (locally abundant towards the eastern end of the grassland), Hogweed, Field Forget-me-knot, Greater Stitchwort, White Dead-nettle, Creeping Buttercup and Curled Dock, occur occasionally throughout the sward, with Foxglove, Grass Vetchling, Hedgerow Cranesbill, Columbine, Comfrey sp. occurring rarely.

11.5.7.4 Scattered Scrub/Scrub

Scattered low-lying scrub is located within the central portion of the vegetated band associated with the northern part of the Site. Vegetation is dominated by Bramble, Dog Rose and Snowberry, with occasional Ash, Silver Birch, Hawthorn, Willow spp. and Hazel saplings. Ground flora is dominated by Cleavers, with frequent Yorkshire Fog, Bramble, Dog Rose and Common Nettle.

11.5.7.5 Tall Ruderal

Tall ruderal vegetation is located with the eastern portion of the vegetated band associated with the northern part of the Site. This habitat type is dominated by Cleavers, Rosebay Willowherb, Bristly Ox-tongue, Ragwort, Curled Dock and Common Nettle. Scrubby species, as described above, occur occasionally within this habitat.

11.5.7.6 Line of Trees

A line of immature broadleaved trees, in good condition, delineates the eastern Site boundary. Frequently occurring species comprise Ash, Beech and Larch. Willow sp. is occasionally present with Silver Birch occurring rarely with an understory supporting abundant Hawthorn. Ground flora comprises abundant Common Nettle, Bramble, Yorkshire Fog and Hawthorn saplings. Rosebay Willowherb is occasionally present.

11.5.8 Protected and Notable Fauna – On-site (Updated Baseline)

11.5.8.1 Amphibians – Great Crested Newt

An eDNA Survey Report is provided in Appendix 11.3.

There are no European statutory sites, no national statutory sites, and no non-statutory sites designated for GCN within 2 kilometres of the Proposed Development. Searches on Magic Map identified 3 European Protected Species Licences for GCN in the area the closest licence record being attributed to the Corby Northern Orbital Road (CNOR) to the north-east of the Site.

To inform the European Protected Species (EPS) licence application for the CNOR a suite of GCN Presence/Absence Surveys were carried out in 2004 by Penny Anderson Associates. The survey data obtained in 2004 was used by Keystone Ecology to inform the previous planning application at the Site. Keystone Ecology has also been able to review current GCN monitoring data, a requirement of the licence for the CNOR. Delta Simons(Ref 11.9) surveyed four ponds to the north of the CNOR in 2014 and confirmed small, medium and large GCN populations. The results of the 2014 monitoring survey identified a significant increase in population size from surveys carried out historically by a variety of companies since 2004 (the results of these are unknown). The waterbodies to the north of

the CNOR fall within 500 metres of the Site and although the CNOR acts as a partial barrier to dispersal, GCN could access terrestrial habitat on-site via the culvert which extends beneath the new road. Should GCN travel between waterbodies to the north of the CNOR, and suitable terrestrial habitats on the Site, the route required would not be direct and would exceed 230 metres. GCN do not typically travel more than 250 metres between their breeding ponds and resting places (Ref 11.10) and as there is an expanse of intervening suitable terrestrial habitat it is unlikely high densities of GCN would commute to distant terrestrial habitat within the Site in order to seek refuge. As GCN populations to the north of the CNOR are expanding, the presence of low numbers of GCN reaching the Site cannot, however, be ruled out.

There are two waterbodies, within the pLWS, which do not appear to have been surveyed historically as part of the CNOR. The closest waterbody is approximately 90 metres away with no major barriers to GCN dispersal. Keystone Ecology undertook an eDNA Survey at each of the waterbodies (Waterbodies 1 and 2) within the pLWS in 2018 and traces of GCN eDNA were confirmed in both. Although there is a wealth of favourable terrestrial habitat, including frequently occurring refuge opportunities, surrounding the waterbodies and elsewhere within the pLWS, the Site provides suitable terrestrial habitat at an intermediate range (Ref 11.11). Suitable GCN habitat on-site is restricted to the narrow bands of vegetation i.e. grassland, scattered scrub, tall ruderal vegetation and a single tree line along the northern and eastern boundaries. The hardstanding and ephemeral/perennial growing within heavily disturbed and compacted gravel offers no refuge opportunities to GCN and as the land to the south of the Site is heavily urbanised, it is highly unlikely GCN would commute across this land as no suitable resting places or breeding opportunities are present beyond the Site's southern boundary. Although the GCN population size within Waterbodies 1 and 2 is unknown, and could potentially be high, it is unlikely GCN would reside on-site at high densities due to the limited area of suitable habitat available and the wealth of closer alternatives within the pLWS.

GCN are well represented in the locality and small, medium and large GCN populations are known. The GCN populations identified within the pLWS and beyond the CNOR are considered to be of Local importance, based on the evidence collected.

11.5.8.2 Amphibians – Species of Principal Importance Common Toad

Common Toad, a SPI, was identified in the desk study search, the closest record being 184 metres to the north. The Site does not support aquatic habitat which could support breeding Common Toad however, natural vegetation along the northern and eastern boundaries of the Site could provide resting places and foraging opportunity for this species.

Common Toads were not observed during the Preliminary Ecological Appraisal (**Appendix 11.1**).

11.5.8.3 Bats Commuting/Foraging

There are records of at least three bat species occurring within 2 kilometres of the Site including: Barbastelle; Daubenton's; and Pipistrelle Spp. Within the Site itself, foraging/commuting habitat is largely restricted to the northern and eastern fringes where natural vegetation is present however, the car park could also be used for foraging by opportunistic bats.

Lighting columns exist on-site and, therefore, the Site is artificially lit when bats are active. Studies have confirmed that lighting affects species assemblage and, therefore, species such as Barbastelle and Daubenton's are highly unlikely to use the Site to forage/commute (Ref. 11.12). These species are more likely to utilise woodland and open water habitats within the pLWS which are currently unlit.

Pipistrelle Spp. bats are known to congregate around lighting and feed on the insects which are attracted to them and, therefore, common bats including Common and Soprano Pipistrelle are most likely to use the Site for commuting and foraging. The rarer Nathusius Pipistrelle was not identified by desk study records and as there are no records of this species within north Northamptonshire (Ref 11.8) the rarer of the Pipistrelle species is likely to be absent from the Site.

The woodland edge, running parallel with the Site's northern boundary, provides a linear feature that could be used as a commuting corridor by a variety of bats, although species assemblage is likely to

comprise those that are tolerant to lighting as stated above. Commuting/foraging bats are of value at a Local Level.

11.5.8.4 Breeding Birds

The poor semi-improved grassland, scattered scrub and line of trees within the Site could hold a very small range of breeding birds considered common and widespread. Woodland edge, flanking the northern boundary, could also support nesting birds. Nesting birds would be of value at the Zone of Influence.

11.5.8.5 Reptiles

The desk study identified a single record of Common Lizard within 500 metres of the Site and this species is scarce within the county (Ref 11.8). Grassland, scrub and tall ruderal vegetation along the Site's northern boundary could support this species, in addition to other common reptiles, including Grass Snake and Slow Worm. Slow Worm are reasonably scarce in the county with Grass Snake more frequently occurring but not common (Ref 11.8). The natural vegetation along the northern boundary is sloped and south facing banks could provide basking opportunities. The Site's edge habitats are well connected to a wealth of suitable habitat within the pLWS increasing the likelihood of their use by foraging reptiles however, given the small areas of suitable habitat present within the Site it is highly unlikely substantial populations of any common reptiles would be present.

The majority of the Site is unsuitable for reptiles, with the exposed hardstanding and ephemeral/short perennial (within heavily compacted and disturbed ground) providing extremely limited foraging opportunity. Whilst Common Lizard can reside in gravel/ephemeral habitat types these are continuously used by vehicles and, therefore, disturbed to a point which would make it unlikely for them to be used.

Refuge opportunities on-site are limited to a single brush pile within the line of trees along the eastern boundary.

Habitats within the adjacent pLWS are extensive and diverse and could provide foraging and refuge opportunities to Grass Snake, Common Lizard and Slow Worm. For this reason the pLWS could support larger populations of common reptiles than the Site itself. As habitat availability on-site is restricted, very low numbers of common reptiles could be supported and, therefore, any reptile population on-site would be of value at the Zone of Influence only.

11.5.8.6 Dormouse

On Site trees are immature and the tree composition and understory is sub-optimal for Dormouse (Ref. 11.13). However, canopy cover along the Site's eastern boundary is continuous with woodland within the pLWS to the north that has potential, to support Dormice. The adjacent pLWS measures approximately 11 hectares and assuming presence of optimal habitat i.e. diverse deciduous woodland with abundant scrub and understory could support between 4 and 10 individuals (Ref 11.13). Records of Dormice are frequently occurring in the locality, particularly to the east of Corby (Ref 11.8) and, therefore any Dormouse population present within the pLWS, which could also make use of fringing habitat on-site, will be of Local Value.

11.5.9 Protected and Notable Fauna – Off-Site (Updated Baseline)

11.5.9.1 Badger

Keystone Ecology previously identified a total of five active Badger setts within the pLWS to the north in 2016. All setts were located in excess of 30 metres from the Site. Extensive runs and latrines confirmed a high level of usage within the pLWS although no digging attempts along the fence line between the pLWS and the Site were observed.

Keystone Ecology undertook an updated Badger Survey in 2018 and suitable foraging and sett building habitat continues to be restricted to the northern and eastern boundary habitats present.

No Badger setts were found during the updated survey and no runs, snuffle marks, latrines or dung pits were identified on or within 30 metres of the Site (**Appendix 11.2**).

The fence line around the perimeter continues to be secure with no signs of digging attempts beneath. Habitat on-site, does not, therefore, form part of the resident social group's territory.

Small mammal runs/burrows identified within the Site are attributed to Rabbit.

11.5.9.2 Bats Roosting

The Site is of negligible value to roosting bats i.e. there are no buildings and none of the trees support Potential Roost Features (PRFs).

There is a single record of a Pipistrelle Spp. bat roosting within 2 kilometres of the Site.

The woodland within the pLWS to the north has not been subject to detailed survey however the trees forming the southern edge of the pLWS and flanking the Site's northern boundary could support roosting bats if PRFs are present within them. The trees along the edge of the pLWS are illuminated by lighting columns within the Site and subject to noise disturbance during both the day and night as a consequence of the car park's regular use and the immediate urban setting. For these reasons the presence of a bat roost within any trees with PRFs is reduced. Crevice dwelling bats, roosting in trees, are also highly transient and often only occupy PRFs sporadically or opportunistically during the year (Ref.11.2).

Based on desk study data, roosting preferences and species tolerance with lighting/noise etc, the occupation of any PRFs at the edge of the pLWS would most likely be by Common or Soprano Pipistrelle bats. Higher status roosts, such as maternity or hibernation roosts, are found in buildings, and therefore, any roosts present would be of a low status i.e. bats roosting in low numbers (Ref. 11.2). Any bat roosts of this nature would be of Local Importance.

11.5.9.3 Otter and Water Vole

No records of Otter or Water Vole were identified in the desk study searches within 0.5 kilometres of the Site.

The stretch of the Northern Stream, running parallel with the Site, and measuring approximately 175 metres in length was subject to survey as well as the channel up and downstream. The channel was followed approximately 100 metres north-east until a culvert extended beneath the Corby Northern Orbital Road and 250 metres to the west within the boundary of the pLWS. The banks of the (Northern Stream vary greatly from 1 metre in height to 10 metres and are all steep and primarily comprise mud. Some areas of the channel were dry and others had a shallow, slow flow. The watercourse was approximately 1.5 metres wide, and where present, water was < 0.1 metres deep. Submerged and emergent vegetation was absent at the time of survey, and marginal vegetation was restricted to occasional stands of Hard and Soft Rush.

No signs of Water Vole were identified during the survey. The absence of field signs infers likely absence of Water Vole along the surveyed section of the Northern Stream.

No signs of Otter were identified during the survey. The absence of field signs infers likely absence of Otter along the surveyed section of the Northern Stream. As Otter is a highly mobile species, and are confirmed along major watercourses in the locality, colonisation of smaller watercourses by Otter is probable in the future. The Northern Stream has the potential to support part of a single territory for one individual or potentially part of overlapping male and female territories (Ref 11.14). Any Otter utilising the Northern Stream in the future would be of Local value and would be unaffected by the Proposed Development as they would be tolerant to current conditions.

The baseline status of the Site, and Northern Stream, with regard to Otter and Water Vole has been confirmed by recent survey (**Appendix 11.4**). Water Vole and Otter have been scoped out of any further assessment.

11.5.9.4 *White-Clawed Crayfish*

The scoping survey included desk-based searches and a detailed assessment of the Northern Stream to identify indicators and/or contra-indicators to crayfish presence. The detailed assessment was conducted in line with habitat preferences and requirements stated within the Monitoring White-Clawed Crayfish guidance report (Ref. 11.15).

No records of White-Clawed Crayfish were identified in the desk study searches and the NBN Atlas (Ref 11.8) did not identify records of White-Clawed Crayfish along any watercourses flowing to the north of Corby town with the closest record situated over 8 kilometres to the south, crossing Corby itself, along the River Ise.

Contra-indicators to the presence of White-Clawed Crayfish were observed as follows.

- The substrate is primarily mud/silt and White-Clawed Crayfish prefer hard substrates to soft, muddy ones.
- The banks are not undercut; there are no exposed tree root systems within the channel; and no overhanging bankside vegetation. These items provide the types of refuge opportunities sought by crayfish.
- There are few in channel refuge opportunities i.e. large boulders/rocks etc.
- The water has a slow flow and in some areas the brook is completely dry. Low water levels increase the vulnerability of White-Clawed Crayfish to predation and whilst they are known to occupy still water they tend to be more prevalent along faster flowing watercourses. White-Clawed Crayfish have specific habitat requirements in order to extend their range up or down stream and the lack of continuous habitat along the Northern Stream effectively isolates the watercourse from migrating White-Clawed Crayfish.
- There is little emergent or marginal vegetation that would provide cover or food resources for this species at the channel's edge.

The Northern Stream is suboptimal for occupation by White-Clawed Crayfish and given the nature of the watercourse, and the fact that White-Clawed Crayfish do not make extensive movements (Ref. 11.16), it is highly likely that this species is currently absent from the Northern Stream and there is no means for future colonisation.

The baseline status of White-Clawed Crayfish along the Northern Stream has been confirmed by recent assessment (**Appendix 11.5**). Crayfish are likely absent from the Northern Stream.

11.6 Identification and Evaluation of Key Effects

11.6.1 *Activities Likely to Generate Effects*

Construction Phase activities or changes likely to generate effects are:

- vegetation clearance from construction footprint;
- runoff of pollutants from construction-site;
- airborne pollutants (i.e. dust) from construction-site;
- noise/vibrations from demolition/construction; and
- light spill from construction-site during evenings and early mornings.

Operational Phase activities or changes likely to generate effects are:

- runoff of pollutants;
- emission of airborne pollutants and pathogens from waste treatment processes;
- noise/vibrations from Site operations and vehicle movements; and
- light spill during 24 hour operation.

No non-standard activities/changes are likely to generate impacts.

11.7 Assessment of Effects and Mitigation Measures – On-site Receptors

11.7.1 Amphibians – Great Crested Newts

There will be direct loss of GCN terrestrial habitat and risk of killing/injuring GCN during the construction phase. Potential negative effects on GCN are predicted during the operational phase from road and drainage infrastructure.

11.7.1.1 Construction Impacts: Site Clearance and Construction Activities Impact and Effect

Construction of a new wall, which will run along the northern edge of the car park, will result in the loss of 38m^2 of poor semi-improved grassland within 100 metres of the closest breeding pond (Waterbody 1). Additional losses of poor semi-improved grassland are also proposed at greater distances from Waterbody 1 as follows:

- 0.0014 hectares terrestrial habitat between 100 and 250 metres; and
- 0.0075 hectares terrestrial habitat between 250 and 500 metres.

Combined losses of terrestrial habitat are small with only 2% of suitable terrestrial habitat, along the northern boundary, being lost. The remaining 98% terrestrial habitat, comprising poor semi-improved grassland, scrub and tall ruderal vegetation will be available to GCN throughout the construction phase. Natural England's Rapid Risk Assessment indicates that the risk to GCN is 'Green - Offence Unlikely' and, therefore, such small losses at these distances will have a negligible effect on the conservation status of the local GCN population. Approximately 0.29 hectares on-site habitat, which currently cannot support GCN i.e. hardstanding/compacted gravel, will be replaced with species rich grassland and a further 0.0081 hectares will become a new terrestrial habitat type which could hold water at certain times of year. Landscape design is, therefore, predicted to have a positive effect on GCN significant at the Zone of Influence in the long-term.

As the majority of suitable terrestrial habitat is being retained, and taking into account the abundance of suitable terrestrial habitat surrounding Waterbodies 1 and 2 i.e. a matrix of habitat in the off-site pLWS, it is highly unlikely killing/injury will occur. There is a slight risk that GCN could be disturbed, injured or killed however, as no core habitat is being lost (defined as habitat within 50 metres of a breeding pond, Ref 11.11) it is unlikely significant numbers of GCN would reside within the 0.013 hectares terrestrial habitat to be affected by construction. The killing/injury of individual GCN could reduce GCN population size fractionally in both the short and long-term but is highly unlikely to reduce population size overall. Consequently, a significant negative effect at the Zone of Influence is predicted.

Mitigation Measures

All areas of suitable terrestrial habitat (not measuring more than 100 metres² within 100 metres of Waterbody 1) will be cleared following a Precautionary Working Method Statement (PWMS) under the direct supervision of a licensed GCN ecologist. The PWMS will set out a robust protocol to follow in the unlikely event a GCN is identified during this clearance.

Protective exclusion fencing, positioned at the boundary of retained habitats, will ensure any amphibians continuing to reside on-site during the construction phase do not stray accidentally into

the working footprint. As the majority of the construction footprint affects hardstanding/compacted gravel, fencing will not act as a permanent barrier to GCN movement as they are not expected to commute into this habitat in any meaningful way i.e. there are no refuge opportunities or breeding ponds within the construction zone or to the immediate south of the Site and, therefore, there is no reason for them to commute in this direction. Fence installation is, therefore, not a licensable action and is designed to protect retained habitat and GCN that use it from accidental killing/injury only.

GCN fence installation, and its subsequent removal at the end of the construction period, can only be carried out when GCN are not in a period of hibernation/dormancy i.e. fencing installation/removal will be delivered when GCN are active and overnight temperatures are consistently above 5°C.

Fencing installation will also be overseen by a licensed GCN ecologist or accredited agent.

Significance of Residual Effects after Mitigation

No residual effect of significance is predicted.

11.7.1.2 Operational Impacts: Fragmentation and Mortality from Road/Drainage Infrastructure

Raised kerbs at the fringe of all green space could result in the fragmentation of GCN should they find themselves within hardstanding habitat and unable to access green space at the northern and eastern fringes of the Site. GCN finding themselves within hardstanding will have no means of escape i.e. dropped kerbs are absent, and animals would either die from exposure, collision with vehicles or by drowning within drainage systems. Fragmentation effects and killing/injury is unlikely to affect high numbers of GCN for the same reasons stated in Construction Impacts. Consequently, a significant negative effect at the Zone of Influence is predicted.

Mitigation Measures

At least two dropped kerbs will be included at the edge of hardstanding within the northern and eastern part of the Site. To avoid mortality, all drainage gullies will be offset from the kerb at the road edge by at least 10 centimetres or wildlife kerbs with a bypass recess will be used adjacent to all drainage gullies.

Significance of Residual Effects after Mitigation

No residual effect of significance is predicted.

11.7.2 Amphibians – Common Toad

There will be direct loss of Common Toad terrestrial habitat and risk of killing/injuring Common Toad during the construction phase. Potential negative effects on Common Toad are predicted during the operational phase from road and drainage infrastructure.

11.7.2.1 Construction Impacts: Site Clearance and Construction Activities Impact and Effect

Small areas of poor semi-improved grassland will be lost to facilitate the construction of a new wall which will run along the northern edge of the car park. Anticipated losses amount to 2% of suitable terrestrial habitat, along the northern boundary. The remaining 98% terrestrial habitat, comprising poor semi-improved grassland, scrub and tall ruderal vegetation will be available to Common Toad throughout the construction phase. Such small losses will have a negligible effect on the conservation status of the local Common Toad population. Approximately 0.29 hectares of on-site habitat, which currently cannot support Common Toad i.e. hardstanding/compacted gravel, will be replaced with species rich grassland and a further 0.0081 hectares will become a new terrestrial habitat type which could hold water at certain times of year. Landscape design is, therefore, predicted to have a positive effect on Common Toads significant at the Zone of Influence in the long-term.

There is a low probability that Common Toad will be killed/injured when clearance takes place. Any losses would be negative and significant at the Zone of Influence.

Mitigation Measures

Mitigation measures stated for GCN will address operational impacts predicted for Common Toad.

Significance of Residual Effects after Mitigation

No residual effect of significance is predicted.

11.7.2.2 Operational Impacts: Fragmentation and Mortality from Road/Drainage Infrastructure

Raised kerbs at the fringe of all green space could result in the fragmentation of Common Toad should they find themselves within hardstanding habitat and unable to access green space at the northern and eastern fringes of the Site. Common Toads finding themselves within hardstanding will have no means of escape i.e. dropped kerbs are absent, and animals would either die from exposure, collision with vehicles or by drowning within drainage systems. Fragmentation effects and killing/injury is unlikely to affect high numbers of Common Toads and a significant negative effect at the Zone of Influence is predicted.

Mitigation Measures

Mitigation measures stated for GCN will address operational impact predicted for Common Toad.

Significance of Residual Effects after Mitigation

No residual effect of significance is predicted.

11.7.3 Bats – Commuting and Foraging

Construction and Site clearance will result in minimal removal of habitat of value to commuting/foraging bats and as the Site will not be floodlit, and night time working is not proposed, construction will have no bearing on the current species assemblage using the Site for foraging/commuting when bats are active i.e. typically between March and October between dusk and dawn. Increased lighting during the operational phase could affect species assemblage/Site usage if habitats are illuminated to a level which prevents their use.

11.7.3.1 Operational Impacts: Lighting

Impact and Effect

As described in Chapter 4 (The Proposed Development) the facility will be lit by a series of external building mounted and pole mounted directional lighting with lighting proposed around external faces, access roads, the car park, and the flue stack. In the absence of a more detailed lighting strategy it is not possible to predict whether habitats currently used by commuting/foraging bats will be affected by a significant increase in light levels. As the Site is already lit, any bats using the Site to commute and forage are already habituated to reasonably high levels of ambient light. Altered species assemblage is unlikely as only common bats, tolerant of lighting, are expected on-site. At worst, Site usage could decrease having a significant negative effect at the Zone of Influence. Assuming operational levels do not render all habitats unsuitable for foraging bats, the introduction of species rich grassland and a new terrestrial habitat type which could hold water at certain times of year could have a positive long-term effect on species assemblage. Species such as Noctule, which has an affinity with water, and is tolerant of lighting, could be attracted to the new drainage pond (Ref. 11.2 and 11.12) resulting

in a long-term positive effect on commuting and foraging bats that is significant at the zone of influence.

Mitigation Measures

A sensitive lighting regime is required to ensure retained and created habitat types along the northern and eastern boundaries are not subject to an increase in existing lighting levels. Prior to commencement a lighting strategy will be produced and submitted for approval. This will cover lighting during the operation of the energy recovery facility. The lighting plan will incorporate the following measures stated in Guidance Note 08/18 (Ref 11.12) to prevent illumination of retained vegetation around the northern and eastern Site boundaries.

- Type of lamp (light source): all luminaires should lack UV elements when manufactured. Metal halide, fluorescent sources should not be used. Luminaires should feature peak wavelengths higher than 550 nanometres to avoid the component of light which is most disturbing to bats.
- Luminaire and light spill accessories: lighting will be directed to where it is needed and light spillage avoided. An upward ratio of 0% and with good optical control should be adopted to avoid illuminating wider areas than necessary which can disturb foraging and commuting bats as well as people and other wildlife.
- Planting may also be used as a barrier or manmade features that are required within the build can be positioned so as to form a barrier.
- Light levels: the light should be as low as guidelines permit. A warm white spectrum (ideally <2700 Kelvin) should be adopted to reduce blue light component. Unnecessary lighting should be avoided where possible.
- Aim of light: the light should be aimed to illuminate only the immediate area required by using as sharp a downward angle as possible. As a last resort, accessories such as hoods, cowls, louvers and shields can direct the light to an intended area.

Significance of Residual Effects after Mitigation

No residual effect of significance is predicted.

11.7.4 Breeding Birds

Construction will result in small losses of nesting bird habitat and negative effects from noise could temporarily deter birds from nesting in retained habitats. No operational effects are predicted as birds returning to nest on-site will be habituated to new site conditions.

11.7.4.1 Construction Impacts: Site Clearance and Construction

Impact and Effect

There will be a direct loss of 0.0089 hectares of nesting bird habitat during the construction phase. This is a small portion of available nesting habitat with 98% being retained. Site clearance during the nesting season, or accidental damage to retained habitat, could disturb nesting birds and/or damage/destroy actively used nests. Habitats on-site can only support common and widespread bird species and, given the wealth of nesting bird opportunities within the adjacent pLWS any direct losses, or short-term reduction in species assemblage, is unlikely to result in an overall decline in local breeding populations. A negative effect significant at the Zone of Influence is predicted for this reason. Approximately 0.29 hectares of on-site habitat, which currently cannot be used by breeding birds i.e. hardstanding/compacted gravel, will be replaced with species rich grassland and a further 0.0081 hectares will become a new terrestrial habitat type which could hold water at certain times of year. Landscape design will, therefore, have a positive effect on breeding birds in the long-term which is predicted to be significant at the Zone of Influence.

Noise, generated during the construction phase, could render retained nesting bird habitat unsuitable in the short-term. Displacement of common and widespread bird species into off-site habitat could result in a slight reduction in breeding success within the Zone of Influence i.e. displacement into the pLWS, however, this effect would be reversible as birds could return to the Site to nest once construction activities ceased. A significant negative effect at the Zone of Influence is predicted.

Mitigation Measures

Taking into account constraints posed by other protected species, clearance of breeding bird habitat will be conducted outside the main bird breeding season which runs March to August (inclusive) to ensure compliance with the Wildlife and Countryside Act 1981 (as amended). RSPB guidelines suggest that this is the period during which the majority of breeding bird activity takes place in the UK.

If vegetation clearance within the timeframe stated above is required, checks of the vegetation will be made by a suitably qualified ecologist to identify active nests and recommend appropriate action where necessary. If an active nest is present, at least a 10 metre radius buffer area (or wider as appropriate and dependent upon the species identified) will be set out, and the feature supporting the nesting birds retained until any young have fledged. To prevent contractors accidentally straying into the buffer area, these should be clearly marked out i.e. with high visibility fencing.

A PWMS will be produced prior to commencement to ensure suitable nesting bird habitat is not inadvertently created during the construction phase and to set out a robust protocol in the event nesting birds are encountered during the works.

The construction footprint will be sufficiently fenced to ensure vehicles/machinery do not accidentally disturb/damage bird's nests which are present in retained habitats adjacent to the construction footprint.

Significance of Residual Effects after Mitigation

A negative effect of significance at the Zone of Influence is predicted during the construction phase due to short term habitat loss and noise generated from construction activities.

Compensation

To compensate for small losses of suitable bird nesting/foraging habitat during the construction phase, the understory of the retained tree line along the eastern boundary will be planted with Hawthorn, Blackthorn, Hazel, Wild Privet and Dogwood which provide cover (and foraging sources) for a range of common bird species. This planting will take place prior to the commencement of Site clearance.

11.7.5 Reptiles

There will be direct loss of terrestrial habitat used by reptiles during the construction phase. Construction activities could also result in the killing/injury of reptiles, if present when works take place or in attempts to cross the construction footprint. No operational effects are predicted as common reptiles are unlikely to become trapped in hardstanding habitat or drainage systems.

11.7.5.1 Construction Impacts: Site Clearance and Construction Activities

Impact and Effect

Construction will result in the loss of 0.0089 hectares terrestrial habitat which could be used by common reptiles. The likelihood of affected habitats being able to support hibernating reptiles is significantly reduced on account of the extremely limited amount of hibernacula present and reasonably sparse sward density. Given that 98% suitable habitat is being retained, small losses of will have a negligible effect on the conservation status of any common reptiles which use the Site. Approximately 0.29 hectares of on-site habitat, which is either unsuitable or provides extremely limited

foraging opportunity i.e. hardstanding/compacted gravel, will be replaced with species rich grassland and a further 0.0081 hectares will become a new terrestrial habitat type which could hold water at certain times of year. Landscape design is, therefore, predicted to have a positive effect on reptiles significant at the Zone of Influence in the long-term.

Although habitat losses are small, clearance could, result in the killing/injury of reptiles. The probability of killing/injury is low and any negative effect would be significant at the Zone of Influence only.

Mitigation Measures

Mitigation measures stated for GCN will address all impacts on common reptiles.

Significance of Residual Effects after Mitigation

No residual effect of significance is predicted.

11.7.6 Dormouse

Habitat loss is not proposed however construction could generate noise which will cause the temporary displacement of active Dormouse northwards and deeper into the adjacent pLWS. Accidental damage to trees proposed for retention would have a similar outcome on active Dormouse during the construction phase. No effects to hibernating Dormouse are predicted as there are no opportunities available to hibernating Dormouse at ground level. No operational effects on Dormouse are predicted as Dormouse could utilise the retained tree line in the long-term.

11.7.6.1 Construction Impacts: Site Clearance and Construction

Impact and Effect

All habitat, which could be used by Dormouse, is to be retained and any Dormouse present are likely to be habituated to reasonably high levels of noise given the urbanised nature of the Site and the connecting pLWS. Construction noise could temporarily displace active Dormouse northwards and deeper into the adjacent pLWS having a temporary and very localised negative effect on Dormouse that is significant at the Zone of Influence. Accidental damage to retained trees along the eastern Site boundary could also cause displacement although this is unlikely as retained trees are situated adjacent to an area allocated for landscaping rather than construction. Disturbance effects on Dormouse would be reversible as this species could return to the Site once construction activities are completed.

Mitigation Measures

Tree protection fencing in accordance with BS5837 will be installed prior to works commencing around the root protection zones of all retained trees within the eastern part of the Site and the southern edge of the adjacent pLWS. This will prevent accidental damage and excessive noise close to trees which may be used by Dormouse during the construction phase.

Significance of Residual Effects after Mitigation

No residual effect of significance is predicted.

11.8 Assessment of Effects and Mitigation Measures – Off-Site Receptors (Updated Assessment)

11.8.1 Statutory Sites – Weldon Park SSSI

The air quality assessment (Chapter 8) has not predicted any negative effects arising from air pollution during the construction phase, however, acid deposition generated during operation could have negative effects on the condition of the ancient woodland for which this SSSI is designated.

11.8.1.1 Impact and Effect

The operation of the new facility, based on air quality assessment (Chapter 8), predicts a Process Contribution from the Proposed Development marginally above the Environment Agency 1% of Critical Level for acid deposition criterion. This results in the Predicted Environmental Concentration (i.e. the Process Contribution plus the baseline at Weldon Park SSSI) being more than 70% of the Critical Level for acid deposition around this SSSI. The SSSI is already subject to baseline levels of acid deposition which exceed the Critical Level, and as the woodland's 'unfavourable recovering' condition is attributed to deer grazing (which is preventing regeneration) rather than pollution factors, acid deposition, already above the Critical Level, does not appear to be having a deleterious effect on the conservation status of the ancient woodland. For these reasons, no significant effect on woodland quality is predicted as a result of a slight increase in localised acid deposition.

11.8.1.2 Mitigation Measures

No mitigation is required provided the minimum stack height of 75 metres is maintained to keep the predicted increase in acid deposition as slight as possible whilst striking a balance between visual effects.

11.8.1.3 Significance of Residual Effects after Mitigation

No residual effect of significance is predicted.

11.8.2 Non-statutory Sites and Green Infrastructure Network/NIA

Air and water pollution and/or dust deposition during the construction phase could generate negative effects on the condition of terrestrial and riparian Northern Stream habitats within the pLWS located to the immediate north of the Site due to proximity. Air and water pollution is predicted to have no significant effect on the adjacent pLWS during the operational phase based on air quality models and strict pollution controls which must be implemented for developments of this nature. Refer to Chapter 12 (Water Quality, Hydrology Flood Risk) and Chapter 8 (Air Quality and Odour). Pollution, during both the construction and operational phases is highly unlikely to have a significant negative effect on the Nene Valley NIA/Green Infrastructure Network overall, as only a small fraction of this resource could be affected and habitats are already set within an urbanised environment.

11.8.2.1 Construction Impacts: Dust Deposition, Air and Water Pollution

Impact and Effect

Dust generated from construction activities could be deposited on terrestrial habitat within the 11 hectare pLWS. There is minimal chance of dust being deposited within riparian habitat in the pLWS due to the density of canopy cover.

In the absence of mitigation, dust deposition could result in localised negative effects significant at up to Local level.

Water pollution could affect the quality of the (Northern Stream i.e. from inappropriate discharge of effluent; waste oils; changes to the drainage system; or waste waters from dewatering etc. Water pollution events would be localised and standard construction controls would reduce the probability of pollution events occurring. Any negative effect would be significant at the Zone of Influence and the effect would be reversible on removal of the source of contamination.

Mitigation Measures

Chapter 12 (Water Quality, Hydrology and Flood Risk) and Chapter 8 (Air Quality and Odour) detail the measures that will be taken to mitigate impacts associated with runoff and airborne pollutants from the Site into the adjacent pLWS during the construction phase of the development.

A CEMP will be produced prior to commencement to ensure pollution events are avoided. This document will set out a rapid response protocol to prevent unexpected spillages from causing a severe pollution incident which would affect water quality in the catchment and how to avoid dust deposition on sensitive ecological receptors i.e. adjacent broadleaved woodland. This document should be developed with reference to current Pollution Prevention Guidelines and advice from the Environment Agency.

Dust management may include the following protocols, as appropriate:

- ensure effective on-site planning locating layout machinery and dust causing activities away from sensitive receptors;
- all vehicles should switch off engines when not in use i.e. no idling vehicles should occur on-site;
- no Site runoff of water or mud should be allowed;
- ensure stockpiles are kept for the shortest time possible and if necessary, the use of sprinklers and hoses for dampening of exposed soil and materials should be employed;
- ensure an adequate supply of water on-site if using sprinklers and hoses for dust suppression;
- where possible, enclosed chutes and covered skips should be used;
- observation of wind speed and direction prior to conducting dust-generating activities to determine the potential for dust nuisance to occur, avoiding potentially dust-generating activities during periods when wind direction may carry dust into sensitive areas and avoiding dust-generating operations during periods of high or gusty winds;
- stockpiles of soils and materials should be located as far as possible from sensitive habitats, taking account of prevailing wind directions and seasonal variations in the prevailing wind;
- completed earthworks should be covered or vegetated as soon as is practicable;
- regular inspection of local highways and Site boundaries to check for dust deposits (and removal if necessary);
- visual inspection of Site perimeter to check for dust deposition (evident as soiling and marking) on vegetation, cars and other objects and taking remedial measures if necessary;
- ensure concrete batcher, where used, has a permit to operate and is operated in accordance with relevant guidance;
- use of dust-suppressed tools for all operations;
- ensuring that all construction plant and equipment is maintained in good working order;
- ensure an adequate supply of equipment on-site to clean any dry spillages;
- only use registered waste carriers to remove waste from Site; and

- no unauthorised burning of any material anywhere on-site.

Significance of Residual Effects after Mitigation

No residual effect of significance is predicted.

11.8.2.2 Construction Impacts: Site Clearance and Construction

Impact and Effect

Due to the proximity of the pLWS to Site there is a risk of accidental damage to trees in the pLWS that are present on and adjacent to the site boundary. Such damage represents a negative effect significant at the Zone of Influence.

Mitigation Measures

Tree protection fencing in accordance with BS5837 will be installed prior to works commencing around the root protection zones of trees within the southern edge of the adjacent pLWS. This will prevent accidental damage to HPI woodland.

Significance of Residual Effects after Mitigation

No residual effect of significance is predicted.

11.8.3 Badger

Currently, no Badger setts will be destroyed/damaged, or disturbed as a result of Site clearance and construction. However, given the prevalence of Badger within the adjacent pLWS, the presence of newly excavated setts, which would be affected by construction, is possible. No negative effects on Badgers are predicted for the operational phase as any Badger that gain access to the Site in the future will be habituated to current noise/light levels and as traffic overnight will be low the risk of collision with vehicles is considered to be negligible.

11.8.3.1 Construction Impacts: Site Clearance and Construction

Impact and Effect

Badger can excavate new setts and pathways in a reasonably short period of time and could be killed/injured by construction activities, if present in a sett when destructive work takes place. The adjacent pLWS supports a main Badger sett and, therefore, the excavation of new setts within 30 metres of the Site are most likely to be Outlying or Single Hole Setts which would be sporadically used. The loss of setts of this nature would have no bearing on the success of the social group present within the pLWS, however, the killing/injury of Badger, whilst in a sett represents a significant negative effect at the Zone of Influence.

Although there is no evidence that Badger access the Site at present, should they do so during construction, there is a risk they could become trapped in open excavations or trenches. Any killing/injury that occurred as a result of this would represent a significant negative effect at the Zone of Influence.

Mitigation Measures

A pre-commencement survey, including all land within 30 metres will be carried out to establish if setts, which will be affected by construction, are now present. If present, and if avoidance measures are not practical, a licence to close the affected setts must be obtained from Natural England prior to ground breaking activities within 30 metres of it commence. Setts can only be closed under licence between 1st July and 30th November.

Existing perimeter fencing will remain intact and gates kept closed at the end of each day to minimise the risk of Badger accessing the Site to forage at night whilst construction activities are ongoing.

As a further precaution, and to avoid individual Badgers becoming trapped in excavations or trenches, any such excavations will be securely covered overnight, or a means of escape provided, such as a scaffold board ramp, no steeper than 45 degrees.

Significance of Residual Effects after Mitigation

No residual effect of significance of effect is predicted.

11.8.4 Bats - Roosting

Site clearance, followed by construction will result in elevated noise during the daytime and the operation of the new facility will generate an altered noise regime on-site which could cause roost abandonment or deter usage of nearby roosting resources in the first 15 metres of broadleaved woodland within the pLWS. Given the density of broadleaved woodland and its sloping topography, construction noise is not expected to travel > 15 metres into the pLWS at significant levels.

Construction noise will have no significant effect on any other bat roosts deeper within the pLWS. The lighting regime on-site is not expected to change during the construction phase however, increased lighting levels, reaching the edge of the pLWS could occur during operation.

11.8.4.1 Construction Impacts: Noise

Impact and Effect

The effect of construction noise on bat roosts is difficult to predict and at worst, PRFs, which are present within trees in the first 15 metres of the pLWS, will temporarily become unsuitable for occupation as a consequence of elevated noise. As bats' hearing sensitivity quickly decreases below 10kHz (Ref. 11.17), and the majority of construction noise is below this, it is unlikely noise generated during construction will result in significant disturbance and cause bats, roosting in PRFs within the southern fringe of the pLWS, to be abandoned. The Site is already set in an urbanised environment and any bats currently roosting along the southern edge of the pLWS are already tolerant to noise during both the day and night. PRFs in trees are used sporadically, and as Common and Soprano Pipistrelle bats use a variety of roosting resources throughout the year, including buildings, they are unlikely to be reliant on roosting resources in the pLWS to maintain their favourable conservation status (Ref 11.2). At worst, temporary abandonment will result in a significant negative effect at the Zone of Influence. The effect of noise on bats is reversible and bats would be expected to return to their roost once construction ceases or noise becomes comparable to levels which are currently tolerated by bats.

Mitigation Measures

Trees along the southern edge of the pLWS, and extending 15 metres into the woodland, will be subject to a Bat Roost Inspection Survey (including tree climbing assessment) to establish if any support suitable PRFs. For each suitable PRF identified a Schwegler 2F bat box will be installed within the pLWS, at least 50 metres from the Site's northern boundary. This will provide alternative roosting opportunities should those along the southern edge of the pLWS be rendered temporarily unsuitable as a consequence of noise. Permission to put the bat boxes within the pLWS will be secured prior to their installation.

Significance of Residual Effects after Mitigation

No residual effect of significance is predicted.

11.8.4.2 Operational Impacts: Noise and Artificial Lighting

The facility will be lit by a series of external building mounted and pole mounted directional lighting with lighting proposed around external faces, access roads, the car park, and the flue stack. In the absence of a more detailed lighting strategy it is not possible to predict whether the southern edge of the pLWS will be affected by a significant increase in light levels. Common Pipistrelle and Soprano Pipistrelle bats are tolerant to reasonably high levels of lighting (Ref. 11.12) and it is unlikely the new lighting regime will reach the northern boundary of the Site at a level which would prevent the occupation of PRFs along the edge of the pLWS. At worst, PRFs in trees along the southern edge of the pLWS would be rendered unsuitable for future use by bats. As Common and Soprano Pipistrelle bats are not expected to be reliant on tree resources to maintain favourable conservation status, the reduced availability of roosting opportunities in trees would have a significant negative effect at the Zone of Influence.

The new facility will generate noise during both the day and night however the majority of this noise will be below 10kHz and, therefore, largely inaudible to bats. The effect of noise on bat roosts is difficult to predict and at worst, PRFs within trees within the first 15 metres along the southern edge of the pLWS will become permanently unsuitable for occupation as a consequence. This will have a significant negative effect at the Zone of Influence as ample alternative roosting opportunities are anticipated elsewhere in the pLWS and a small reduction in roost availability will not affect the conservation status of common bat species.

Mitigation Measures

A sensitive lighting regime is required to ensure the southern edge of the pLWS is not subject to an increase in existing lighting levels. Prior to commencement a lighting strategy will be produced and submitted for approval. This will cover lighting during the construction and operation of the energy recovery facility. The lighting plan will incorporate the following measures stated in Guidance Note 08/18 (Ref 11.12) to prevent illumination of retained vegetation around the northern and eastern Site boundaries.

- Type of lamp (light source); all luminaires should lack UV elements when manufactured. Metal halide, fluorescent sources should not be used. Luminaires should feature peak wavelengths higher than 550 nanometres to avoid the component of light which is most disturbing to bats.
- Luminaire and light spill accessories: lighting will be directed to where it is needed and light spillage avoided. An upward ratio of 0% and with good optical control should be adopted to avoid illuminating wider areas than necessary which can disturb foraging and commuting bats as well as people and other wildlife.
- Planting may also be used as a barrier or manmade features that are required within the build can be positioned so as to form a barrier.
- Light levels: the light should be as low as guidelines permit. A warm white spectrum (ideally <2700 Kelvin) should be adopted to reduce blue light component. Unnecessary lighting will be avoided where possible.
- Aim of light: the light should be aimed to illuminate only the immediate area required by using as sharp a downward angle as possible. As a last resort, accessories such as hoods, cowls, louvers and shields can direct the light to an intended area.

Significance of Residual Effects after Mitigation

No residual effect of significance is predicted.

11.9 Assessment of Cumulative Effects

There are no cumulative effects from the schemes identified in Chapter 3 (EIA Methodology). With the exception of small losses of habitat which could be used by nesting birds and common reptiles, there are no overlapping effects between the Proposed Development and those assessed in this chapter.

11.10 Biodiversity Gain and Enhancements

In accordance with the NPPF (Ref 11.5), Policies 4, 19 (Ref. 11.6) and Objective 10 (Ref 11.7), the proposed mitigation described above, and opportunities for biodiversity enhancement (above and beyond those required to mitigate for the identified impacts) are set out below. Enhancements suggested will maximise opportunities for biodiversity across the proposed development, with a focus on the retention/creation of functional connections between the Site and the wider landscape. Where possible, measures also focus on the provision of suitable habitats for species/habitats included within the Northamptonshire BAP.

Retained habitat measures will include the following.

- Existing grassland will become a set-aside area to encourage growth, creating a tussocky sward that would become attractive to a range of invertebrates, whilst providing a natural refuge for reptiles and GCN, nesting habitat for birds and foraging for bats i.e. not intensively mown and on a long cutting regime.
- A selection of bird boxes will be fitted to retained trees to encourage birds to nest on-site. Artificial nest boxes will be targeted at Northamptonshire's target BAP species for Lowland Mixed Deciduous Woodland. Purpose built woodpecker boxes, sparrow terraces and the 1N Schwegler Deep Box would attract a variety of birds targeted within the local BAP.

Created habitat will be made up of the following.

The drainage pond, designed to hold surface water at certain times of year i.e. is likely to be dry for the majority of the year, and surrounding species rich grassland, will introduce new and varied habitat types to the Site which could attract a variety of wildlife including amphibians, reptiles, invertebrates, birds and bats. To maximise the biodiversity potential of these created habitats the following is recommended.

- The edges of the drainage basin should be stepped to create shallow areas at the pond's margins. Shallow areas of water in spring would create opportunities for amphibians display.
- The margins of the drainage basin should be stocked with native plants which can tolerate dry and fluctuating conditions including: Bulrush; Reed Canary Grass; Soft Rush; Hard Rush; Cuckoo Flower; Meadowsweet; and Ragged Robin.
- Rock or log piles at the edge of the drainage basin will increase refuge opportunities to reptiles and amphibians; and
- Native species rich grassland, surrounding the drainage basin, should be subject to a long cutting regime to maximise sward height throughout the year and generate additional refuge opportunities near to the edge of the drainage basin.

Created and retained habitats should be managed for the benefit of wildlife in the long-term following a Landscape and Ecological Management Plan (LEMP).

11.11 Differences from the Consented Development and Summary

An updated baseline and assessment was required to inform current Site proposals and the following ecological receptors were scoped into the assessment:

- Nene Valley Nature Improvement Area / Green Infrastructure Network / pLWS;
- Great Crested Newts;

- Common Toad;
- Badger;
- Bats – Roosting;
- Bats – Commuting/Foraging;
- Breeding Birds;
- Reptiles;
- Dormouse.

For all ecological receptors that were previously scoped in, mitigation requirements to address impacts are similar, if not the same as reported in the 2016 assessment. Some ecological receptors were not assessed in 2016 and are now included in this assessment /considered in more detail.

With the exception of nesting birds, whereby a residual negative effect of significance at the Zone of Influence is predicted during the construction phase (due to short term habitat loss and noise generated from construction activities), no residual effect of significance is predicted for any other ecological receptors (both on and offsite).

Table 11.5 below provides a summary of all impacts, mitigation and effects.

Table 11.5 Ecology Summary Table

Impacts	Characterisation of unmitigated impacts on features	Effects without mitigation	Mitigation	Significance of effects of residual impacts (after mitigation)	Compensation
On-site Receptors					
GCN					
Construction Impacts: Site Clearance and Construction					
Loss of habitat and killing/injury of GCN	<p>Combined losses of terrestrial habitat are small with only 2% of suitable terrestrial habitat being lost.</p> <p><38m² terrestrial habitat loss within 100 metres of the closest breeding pond (Waterbody 1)</p>	<p>Habitat loss will have a negligible effect on the conservation status of the local GCN population. Habitat, creation will have a significant positive effect on GCN in the long-term.</p> <p>The killing/injury could reduce GCN population size fractionally in the short and long-term but is highly unlikely to reduce population size overall. A significant negative effect at the Zone of Influence is predicted.</p>	<p>Clearance will following a PWMS and be carried out under the direct supervision of a licensed GCN ecologist.</p> <p>Protective exclusion fencing, positioned at the boundary of retained habitats will protect GCN from accidental killing/injury. Fencing installation will be overseen by a licensed GCN ecologist in suitable weather parameters.</p>	No negative effects of significance are predicted.	n/a
Operational Impacts: Fragmentation and Road Mortality					
Killing/injury of GCN and fragmentation effects from gully pots	GCN finding themselves within hardstanding habitat will have no means of escape i.e. dropped kerbs are absent, and animals would either die from exposure, collision with vehicles or by drowning	Fragmentation effects and killing/injury is unlikely to affect high numbers of GCN and a significant negative effect at the Zone of Influence is predicted.	<p>At least 2 dropped kerbs will be included at the edge of hardstanding within the northern and eastern part of the Site.</p> <p>To avoid mortality, all drainage</p>	No negative effects of significance are predicted.	n/a

Impacts	Characterisation of unmitigated impacts on features	Effects without mitigation	Mitigation	Significance of effects of residual impacts (after mitigation)	Compensation
	within drainage systems.		gullies will be offset from the kerb at the road edge by at least 10 centimetres or wildlife kerbs with a bypass recess will be used adjacent all drainage gullies.		

Common Toad

Construction Impacts: Site Clearance and Construction

Killing/injury and loss of habitat	Anticipated losses from Site clearance amount to 2% of suitable terrestrial habitat.	Small habitat losses will have a negligible effect on the conservation status of the local Common Toad population. Habitat creation will have a significant positive effect. Although habitat losses are small, clearance could, result in the killing/injury of Common Toad. The probability of killing/injury is low and any negative effect would be significant at the Zone of Influence.	Refer to GCN above.	No negative effects of significance are predicted.	n/a
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Impacts	Characterisation of unmitigated impacts on features	Effects without mitigation	Mitigation	Significance of effects of residual impacts (after mitigation)	Compensation
Killing/injury of Common Toad and fragmentation effects from gully pots	Common Toadfinding themselves within hardstanding habitat will have no means of escape i.e. dropped kerbs are absent, and animals would either die from exposure, collision with vehicles or by drowning within drainage systems.	Fragmentation effects and killing/injury is unlikely to affect high numbers of Common Toads and a significant negative effect at the Zone of Influence is predicted.	Refer to GCN above.	No negative effects of significance are predicted.	n/a

Reptiles

Construction Impacts: Site Clearance and Construction

Killing/injury and loss of habitat	Construction will result in the loss of 2% available terrestrial habitat. The likelihood of affected habitats being able to support hibernating reptiles is significantly reduced on account of the extremely limited amount of hibernacula present and reasonably sparse sward density.	Although habitat losses are small, clearance could, result in the killing/injury of reptiles. The probability of killing/injury is low and any negative effect would be significant at the Zone of Influence only.	Refer to GCN above.	No negative effects of significance are predicted.	n/a
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Bats – Commuting and Foraging

Operational Impacts: Lighting

Impacts	Characterisation of unmitigated impacts on features	Effects without mitigation	Mitigation	Significance of effects of residual impacts (after mitigation)	Compensation
Loss of habitat from illumination	<p>The building, access roads, the car park, and the flue stack will be lit.</p> <p>Lighting could render habitat currently used by commuting/foraging bats unsuitable.</p>	<p>Altered species assemblage is unlikely. At worst, Site usage could decrease having a significant negative effect at the Zone of Influence.</p> <p>Assuming operational levels do not render all habitats unsuitable for foraging bats, the introduction of species rich grassland and a new terrestrial habitat type which could hold water at certain times of year could have a positive long-term effect on species assemblage.</p>	<p>Prior to commencement a lighting strategy will be produced and submitted for approval. The lighting plan will incorporate the following measures stated in Guidance Note 08/18 (Ref 11.12).</p>	<p>No negative effects of significance are predicted.</p>	n/a

Dormouse

Construction Impact: Site Clearance and Construction

Noise and Accidental Damage	<p>The retained tree line, could be used by Dormouse. Construction noise or accidental damage to the retained tree line on-site could temporarily displace active Dormouse northwards and deeper into the adjacent pLWS.</p>	<p>Displacement would be temporary and would have a localised negative effect on Dormouse that is significant at the Zone of Influence.</p>	<p>Tree protection fencing in accordance with BS5837 will be installed prior to works commencing around the root protection zones of all retained trees within the eastern part of the Site and the southern edge of the adjacent pLWS.</p>	<p>No negative effects of significance are predicted.</p>	n/a
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Breeding Birds

Impacts	Characterisation of unmitigated impacts on features	Effects without mitigation	Mitigation	Significance of effects of residual impacts (after mitigation)	Compensation
<i>Construction Impacts: Site Clearance and Construction</i>					
Disturbance to nesting birds and/or damage/destruction of actively used nests	<p>Site clearance during the nesting season, or accidental damage to retained habitat, could disturb nesting birds and/or damage/destroy actively used nests.</p> <p>Noise, generated during the construction phase, could render retained nesting bird habitat unsuitable in the short-term.</p>	Any direct losses, or short-term reduction in species assemblage is unlikely to result in an overall decline in local breeding populations. A negative effect significant at the Zone of Influence is predicted for this reason.	<p>Clearance of breeding bird habitat will be conducted outside the main bird breeding season. If this is not possible checks of the vegetation will be made beforehand.</p> <p>A PWMS will be produced prior to commencement.</p> <p>The construction footprint will be sufficiently fenced to ensure vehicles/machinery do not accidentally disturb/damage bird's nests in retained habitats.</p>	A negative effect of significance at the Zone of Influence is predicted during the construction phase due to short term habitat loss and noise generated from construction activities.	The understory of the retained tree line along the eastern boundary will be planted with Hawthorn, Blackthorn, Hazel, Wild Privet and Dogwood which provide cover (and foraging sources) for a range of common bird species. This planting will take place prior to the commencement of Site clearance.

Off-Site Receptors

Statutory Sites – Weldon Park SSSI

Operation Impacts –Aid Deposition

Air Pollution arising from acid deposition	Acid deposition is predicted to be marginally above the Environment Agency 1%	The SSSI is already subject to baseline levels of acid deposition which exceed the Critical Level, and as the woodland's	No mitigation is required provided the minimum stack height of 75 metres is maintained to keep the	No negative effects of significance are predicted.	n/a
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Impacts	Characterisation of unmitigated impacts on features	Effects without mitigation	Mitigation	Significance of effects of residual impacts (after mitigation)	Compensation
	of Critical Level. This increase results in the Predicted Environmental Concentration (i.e. the Process Contribution plus the baseline at Weldon Park SSSI) being more than 70% of the Critical Level for acid deposition around this SSSI.	'unfavourable recovering' condition is attributed to deer grazing (which is preventing regeneration) rather than pollution factors, acid deposition, already above the Critical Level, no significant effect on woodland quality is predicted as a result of a slight increase in localised acid deposition.	predicted increase in acid deposition as slight as possible whilst striking a balance between visual effects.		

Non-statutory Sites and Green Infrastructure Network/NIA

Construction Impacts -Pollution

Dust Deposition, Air and Water Pollution	Air and water pollution and/or dust deposition during the construction phase could generate negative effects on the condition of terrestrial and riparian (Northern Stream) habitats within the pLWS located to the immediate north of the Site due to proximity.	Dust deposition could result in localised negative effects significant at up to Local level. Water pollution could affect the quality of the Northern Stream. Water pollution events would be localised and standard construction controls would reduce the probability of pollution events occurring. Any negative effect would be significant at the Zone of Influence and the effect would be reversible on removal of the source of contamination.	Chapter 12 (Water Quality, Hydrology an Flood Risk) and Chapter 8 (Air Quality and Odour) detail the measures that will be taken to mitigate impacts associated with runoff and airborne pollutants from the Site into the adjacent pLWS during the construction phase of the development. A CEMP will be produced prior to commencement to ensure pollution events are avoided.	No negative effects of significance are predicted.	n/a
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Impacts	Characterisation of unmitigated impacts on features	Effects without mitigation	Mitigation	Significance of effects of residual impacts (after mitigation)	Compensation
<i>Badger</i>					
Construction Impacts – Site Clearance and Construction					
Killing/injury and potential sett loss	Currently, no Badger setts will be destroyed/damaged, or disturbed as a result of Site clearance and construction. Given the prevalence of Badger within the adjacent pLWS, the presence of newly excavated setts, which would be affected by construction, is possible.	Sett loss would have no bearing on the success of the social group within the pLWS, however, the killing/injury of Badger, whilst in a sett represents a significant negative effect at the Zone of Influence. Should Badger access the Site during construction there is a risk they could become trapped in open excavations or trenches. Any killing/injury that occurred as a result of this would represent a significant negative effect at the Zone of Influence.	A pre-commencement survey, including all land within 30 metres will be carried out to establish if setts, which will be affected by construction, are now present. Existing perimeter fencing will remain intact and gates kept closed at the end of each day. Excavations or trenches will be securely covered overnight, or a means of escape provided, such as a scaffold board ramp, no steeper than 45 degrees.	No negative effects of significance are predicted.	n/a

Bats – Roosting

Construction Impacts – Site Clearance and Construction

Impacts	Characterisation of unmitigated impacts on features	Effects without mitigation	Mitigation	Significance of effects of residual impacts (after mitigation)	Compensation
Noise	Construction will alter the existing noise regime which could cause roost abandonment or deter usage of nearby roosting resources in the first 15 metres of broadleaved woodland within the pLWS.	Common and Soprano Pipistrelle bats are unlikely to be reliant on roosting resources in the pLWS to maintain their favourable conservation status. At worst, temporary abandonment will result in a significant negative effect at the Zone of Influence. The effect of noise on bats is reversible.	Trees along the southern edge of the pLWS, and extending 15 metres into the woodland, will be subject to a Bat Roost Inspection Survey (including tree climbing assessment). For each suitable PRF identified a Schwegler 2F bat box will be installed within the pLWS, at least 50 metres from the Site's northern boundary.	No negative effects of significance are predicted.	n/a

Operational Impacts – Noise and Lighting

Disturbance	Operational lighting could result in a significant increase in light levels reaching the edge of the pLWS. The new facility will generate noise during both the day and night however the majority of this noise will be below 10kHz and, therefore, largely inaudible to bats.	At worst, PRFs in trees along the southern edge of the pLWS would be rendered unsuitable for future use by bats. The reduced availability of roosting opportunities in trees would have a significant negative effect at the Zone of Influence. At worst elevated noise will cause PRFs within trees within the first 15 metres along the southern edge of the pLWS to become permanently unsuitable for occupation. This will have a significant negative effect at the Zone of Influence.	Prior to commencement a lighting strategy will be produced and submitted for approval. The lighting plan will incorporate the following measures stated in Guidance Note 08/18 (Ref 11.12).	No negative effects of significance are predicted.	n/a
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11.12 References

- Ref 11.1:** Chartered Institute of Ecology and Environmental Management (2017). *Guidelines for Ecological Report Writing*. Available at:
https://www.cieem.net/data/files/Publications/Ecological_Report_Writing_Dec2017.pdf.
- Ref 11.2:** Collins, J. (Ed.) (2016). *Bat Surveys for Professional Ecologists – Good Practice Guidelines* (3rd Edition). Bat Conservation Trust: London.
- Ref 11.3:** Chartered Institute of Ecology and Environmental Management (2018). *Guidelines for Ecological Impact Assessment in the United Kingdom. Terrestrial, Freshwater and Coastal*. Available at: <https://www.cieem.net/data/files/ECIA%20Guidelines.pdf>
- Ref 11.4:** Natural History Museum (2016). *UK Species Inventory*. Available at:
<http://www.nhm.ac.uk/research-curation/scientific-resources/biodiversity/uk-biodiversity/uk-species/index.html>
- Ref 11.5:** National Planning Policy Framework (2018): Available at:
<http://www.communities.gov.uk/documents/planningandbuilding/pdf/2116950.pdf>
- Ref 11.6:** North Northamptonshire Joint Planning Unit. *Northamptonshire Joint Core Strategy (2011 – 2031)*. Available at: <http://www.nnjpu.org.uk/docs/Joint%20Core%20Strategy%202011-2031%20High%20Res%20version%20for%20website.pdf>
- Ref 11.7:** Northamptonshire's Mineral & Waste Local Plan (2017). Available at:
<https://www3.northamptonshire.gov.uk/councilservices/environment-and-planning/planning/planning-policy/minerals-and-waste-planning-policy/Pages/update-of-the-adopted-minerals-and-waste-local-plan.aspx>
- Ref 11.8:** National Biodiversity Network Atlas (2018). NBN Atlas Partnership. Available at:
<https://nbnatlas.org/>
- Ref 11.9:** Delta Simons (2014). *Great Crested Newt Monitoring Survey Report – Corby Northern Orbital Road*. Available at:
[http://www.northamptonshire.gov.uk/en/councilservices/Environ/planning/planapps/Documents/PDF%20Documents/County%20Council%20Apps/13.00089.CCDVOC-GCNMonitoringReport\(DatedOct14\).pdf](http://www.northamptonshire.gov.uk/en/councilservices/Environ/planning/planapps/Documents/PDF%20Documents/County%20Council%20Apps/13.00089.CCDVOC-GCNMonitoringReport(DatedOct14).pdf)
- Ref 11.10:** Cresswell, W. and Whitworth, R. (2004). *An assessment of the efficiencies of capture techniques and the value of different habitats for the Great Crested Newt Triturus cristatus*. English Nature Research Report No. 576. Natural England: Peterborough.
- Ref 11.11:** English Nature (2001). *Great Crested Newt Mitigation Guidelines*. English Nature.
- Ref 11.12:** Institution of Lighting Professionals (2018). *Bats and Artificial Lighting in the UK – Guidance Note 08/18*. Institution of Lighting Professionals. Available at: <https://www.bats.org.uk/our-work/buildings-planning-and-development/lighting>
- Ref 11.13:** Bright, P., Morris, P. and Mitchell-Jones, A.J. (2006). *The Dormouse Conservation Handbook*. 2nd ed. English Nature: Peterborough.
- Ref 11.14:** Highways Agency (2001). *Design Manual for Roads and Bridges: Nature Conservation Advice in Relation to Otters*. HA 81/99.