Appendix D
EIAR Chapter 5 Biodiversity

HERBATA DATA CENTRE, NAAS

EIAR
VOLUME I MAIN TEXT – CHAPTER 5 BIODIVERSITY

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5 BIODIVERSITY

5.1 Introduction

An Ecological Impact Assessment (EcIA) has been undertaken of all areas within the Project site, as described within Chapter 3 of the EIAR. The scope of this EcIA is to identify ecological constraints within the study area, by means of the following:

- Identifying the Zone of Influence (ZoI) of the Project on the natural environment;
- Establishing the baseline with regard to terrestrial and aquatic habitats, flora and fauna (volant and non-volant mammals, invertebrates, avifauna etc.) within the ZoI of the Project;
- Ascertaining the potential impacts upon all ecological receptors within the development footprint and the ZoI to include, but not be limited to, species protected under the European and National Legislation, including the EU Habitats and Birds Directives and Irish Wildlife Acts (1976 to 2012, as amended); and,
- Presenting measures to avoid or minimise potential damage to any sensitive ecological receptors supported within the receiving environment.

The professional judgement expressed herein is the true and bona fide opinion of our professional ecologist. The information prepared and provided is accurate at the time of issue of this report and has been prepared and provided in accordance with the CIEEM Code of Professional Conduct (CIEEM 2022).

This Chapter is supported by Volume II Technical Appendices:

- Appendix 5.1: National Biodiversity Data Centre Records ; and
- Appendix 5.2: Ecological Survey for Bats.

This Chapter is supported by the following Figures, within Volume III:

- Figure 5.1: Biodiversity Study Area;
- Figure 5.2: Designated Sites and Features of Natural Heritage Importance; and
- Figure 5.3: Extended Phase 1 Habitat Survey.
- Figure 5.4: Protected Species.

5.2 Assessment Methodology

5.2.1 Ecological Impact Assessment

EcIA is the process of identifying, quantifying and evaluating the potential effects of a project on ecological features based on objective assessment of the best information available (CIEEM 2018). An ecological feature is defined as a species, habitat or ecosystem that has the potential to be affected by a project.

The aim of the EcIA, detailed within this chapter of the EIAR, is therefore to describe the existing ecological features; to identify the potential impacts associated with the Project during construction, operation and decommissioning; to evaluate the likely significance of effects on the ecological features; to apply the mitigation hierarchy to avoid, mitigate and compensate for ecological impacts; and to highlight potential opportunities for ecological enhancement (CIEEM 2018).

The EcIA has been written in accordance with the Chartered Institute of Ecology and Environmental Management (CIEEM) *Guidelines for Ecological Impact Assessment in the UK and Ireland* (CIEEM 2018).

5.2.2 Relevant Guidance and Legislation

The EcIA has been undertaken in accordance with the British Standard (BS) 42020:2013; guidelines produced by the CIEEM (CIEEM 2018); experience of 'best practice' in ecological assessment; and criteria set out within this sub-section.

5.2.2.1 International Directives

Council Directive on the Conservation of Natural Habitats of Wild Fauna and Flora (92/43/EEC) (The Habitats Directive)

The main aim of the Directive is to promote the maintenance of biodiversity through the conservation of natural habitats and wild species listed on the Annexes of the Directive. Member States are required to take measures to maintain or restore, at favourable conservation status, biodiversity whilst taking account of economic, social, cultural requirements and regional and local characteristics.

It gives effect to site and species protection measures through establishment of the Natura 2000 network and designation of European Sites including Special Areas of Conservation (SAC) and Special Protected Areas (SPA). It also establishes a list of species (other than birds) whose habitats must be protected to secure their survival. These priority species and habitats are subject to a higher level of protection.

The Directive also requires appropriate assessment of any plan or project not directly connected with or necessary to the management of a European Site, but likely to have significant effects upon a European site, either individually or in combination with other plans or projects.

Council Directive on the Conservation of Wild Birds (2009/147/EC) (The Birds Directive)

The Directive provides a framework for the conservation and management of, and human interactions with, wild birds in Europe. It makes provisions for the maintenance of the wild bird populations across their natural range; conserves the habitats for rare or vulnerable species listed in Annex I and of migratory species through the classification of SPAs and provides protection for all wild birds.

5.2.2.2 Irish Legislation

Statutory Instrument No. 355/2015 European Communities (Birds and Natural Habitats) (Amendment) Regulations 2015 provides that the following shall be construed together as one:

- Wildlife Act 1976;
- Wildlife (Amendment) Acts of 2000, 2010 and 2012;
- European Communities (Birds and Natural Habitats) (Restrictions of the Use of Poison Bait) Regulations 2010;
- European Communities (Birds and Natural Habitats) Regulations 2011;
- European Communities (Birds and Natural Habitats) (Amendment) Regulations of 2013, 2015; and
- Wildlife Amendment Bill 2016.

European Communities (Birds and Natural Habitats) Regulations 2011 to 2015

The Regulations give effect to requirements relating to the designation of protected sites under the Birds Directive and Habitats Directive. The Regulations provide for the protection and management of European Sites and place obligations on all public authorities to have regard to the requirements of the Habitats Directive beyond the realms of planning related consents issued under the Planning and Development Act 2000, as amended. The Regulations also provide for the protection of species of European importance.

Wildlife Acts 1976 to 2012

The Acts provide for *inter alia* the protection of wildlife. The Acts prohibit the intentional killing, taking or injuring of certain wild birds or wild animals; or the intentional destruction, uprooting or picking of certain wild plants.

Wildlife Amendment Bill 2016

The purpose of the Bill is to provide for the implementation of a reconfiguration of the Raised Bog Natural Heritage Area Network arising from (i) the proposals from the Review of Raised Bog Natural Heritage Area

Network published in January 2014; (ii) an assessment of the effects on the environment of the proposals arising from the Review and, if required, any other screening for an assessment or as the case may be, assessment, including public consultation undertaken and (iii) observations or submissions received during the course of public consultation.

The Wildlife Amendment Bill is currently at Committee Stage.

Taken as a whole, nature conservation legislation is of key importance in undertaking EcIA for the Project as it shapes planning policy.

5.2.2.3 Planning Policy

Kildare County Development Plan 2023-2029

An overarching theme of the development plan in relation to Biodiversity is to ensure that there are no detrimental impacts to the natural heritage and biodiversity of the County.

Policies set out in respect of natural heritage and biodiversity, as set out within Chapter 12: Biodiversity and Green Infrastructure, include a range of provisions to protect and conserve Natura 2000 sites, Natural Heritage Areas (NHA) and proposed NHAs (pNHA), species and habitats listed within the local Biodiversity Action Plan (BAP), ecological buffer zones, nature development areas and river corridors in addition to peatlands, woodlands and other habitats of higher ecological value.

5.2.3 Study Area

The study area, which encompasses the areas which are to be affected by the Project in addition to surrounding areas of terrestrial habitat, are generally characterised by the presence of a semi-improved and improved agricultural grasslands in addition to areas of wet grassland, scrub, amenity grassland, gardens and hardstanding. The ecological study area and extent is illustrated in Figure 5.1 Biodiversity Study Area (Volume III).

On a precautionary basis the assessed ZoI extends beyond the study area (the Project site) to include European and Nationally designated sites within 15km of the study area and ecological receptors to be potentially affected by the biophysical changes caused by the Project. In addition, sites which are hydrologically linked to the proposals are also considered. The designated sites and ecological receptors within the ZoI of the Project are presented and discussed below.

5.2.4 Baseline

5.2.4.1 Desk Study

The National Biodiversity Data Centre (NBDC) is a national organisation that collates, manages, analyses and disseminates data on Ireland's biodiversity. It is funded by the Heritage Council and the Department of Arts, Heritage and the Gaeltacht. The NBDC provides access to all validated biodiversity data through Biodiversity Maps, the on-line biodiversity data portal.

Biodiversity records and full species accounts can be viewed and scrutinised through an interactive Biodiversity Maps portal (http://maps.biodiversityireland.ie/#/Home). This is a tool that can be used to help make a preliminary assessment of biodiversity issues when considering site-specific projects.

The chosen search area using the NBDC search tool was customised in order to captures all records within a minimum 1km distance of the Project site and is illustrated at Appendix 5.1. The principal purpose of this task is to capture any records of protected species or species of natural heritage importance in close proximity to the Project site boundary. The ZoI of the Project for protected species, does not extend further than this.

NPWS GIS habitat data files were used to overlie the site to determine the presence of features of ecological significance.

5.2.4.2 Habitat Survey

Extended Phase 1 Habitat Survey was conducted of the site in October 2022 and June 2023 and covered the entirety of the study area. The survey was undertaken in line with the Heritage Council's *Best Practice*

Guidance for Habitat Survey and Mapping (Heritage Council, 2011). Ecological value is based upon CIEEM and NRA guidelines (CIEEM, 2018; NRA, 2009).

The survey was extended to include further information on the potential of the habitats identified to support species protected by law or of natural heritage importance. All habitats were mapped and categorised in accordance with the Heritage Council *Guide to Habitats in Ireland* (Fossitt, 2000). A search was undertaken for protected and invasive flora species. Aerial photographs were used as an aid to mapping habitats.

It should be noted that whilst every effort has been made to provide a comprehensive description of the site of the Project no survey can consist of a complete characterisation and prediction of the ecological environment.

5.2.4.3 Otter Survey

An otter *Lutra lutra* survey was carried in October 2023 and June 2023 in order to establish the presence of otter dens and/or otter foraging areas. The site and a buffer of at least 200m, from watercourses, woodlands and scrub, was surveyed for the presence of otter activity including:

- Holts
- Couches
- Spraints
- Otter paths
- Slides
- Paw prints

5.2.4.4 Preliminary Ecological Appraisal for Bats

A Preliminary Ecological Appraisal for Bats (PEAB) comprising of a desk study and site walkover has been completed for the Project. The aim of the site walkover was to observe, assess and record the potential suitability of the site to support bat roosting habitat, commuting habitat and/or foraging habitat. Habitat features were classified as negligible, low, moderate or high in accordance with Bat Conservation Trust (BCT) Good Practice Guidelines (Collins 2016).

5.2.4.5 Preliminary Roost Assessment of Structures

A Preliminary Roost Assessment (PRA) of structures within the site was carried out during daylight hours in October 2022. This survey was undertaken in accordance with Collins (2016). An external inspection survey of structures was undertaken from ground level to look for potential and actual bat entry/exit points, evidence of bat roosts and signs of bat related activity in order to determine the presence or likely presence of bats.

5.2.4.6 Tree Climbing PRF Inspection Survey

A Tree Climbing PRF Inspection Survey was carried out by two suitability qualified bat surveyors using tree-climbing equipment, ladders, a torch and endoscope in May and July 2023. The aim of the survey was to allow closer inspection of PRFs identified during the ground level PRA of trees. The survey aims to look for evidence of bats including live or dead bats, droppings, staining, odour and/or other physical characteristics and where necessary to reclassify PRFs in accordance with Collins (2016). Survey results were compared with information and records from the *Bat Roosts in Trees: A Guide to Identification and Assessment for Tree-Care and Ecology Professionals* (Andrews 2018) to aid in the classification and identification of PRFs.

5.2.4.7 Bat Activity Surveys

Bat Activity Surveys were carried out to determine the assemblage of bat species within the site; the nature of bat behaviour; and the spatial distribution of bat activity within the site. Walked transects were surveyed to record and determine the level of bat activity within the site of the Project. The location of transects was determined by site access, health and safety considerations and suitable habitat features for bats.

5.2.4.8 Emergence Survey of Structures

An emergence survey of the structures was carried out to watch, listen and record bats exiting or entering potential roosts. A single dusk survey was carried out in June 2023 in accordance with the Bat Conservation Trust Best Practice Guidelines (Collins 2016) and BCT Interim Guidance Note: Use of night vision aids for bat emergence surveys (BCT 2022). The document states: "*The 4th edition of the survey guidelines will therefore transition away from the standard use of dawn surveys, particularly as a method for presence/absence surveys, in favour of dusk surveys supported by NVAs*".

Night Vision Aids (NVAs) including high spec Canon XA11 Compact Full HD Camcorders aided by two Nightfox XB5 850NM Infrared LED Flashlights per camcorder were used to record bats. LED infrared illuminator security spot lamps were also positioned at buildings to provide extra infrared illumination, if required. Elekon Batlogger M bat detectors with real time full spectrum recording, an integrated Global Positioning System (GPS) and temperature logger were paired with each camcorder and used to record bat echolocation calls. A Pulsar Axion XM30S handheld thermal imaging monocular was also used by the bat surveyor as a complementary survey aid to provide additional data to the video and acoustic data. The NVA equipment was deployed and monitored by two surveyors during the course of the survey. The video recordings were analysed using VLC video player software at 1 – 1.5x speed and slowed down to <0.5x speed when required.

Further details on all bat surveys including survey dates and weather conditions are set out within the accompanying Ecological Survey for Bats (see Appendix 5.2, Volume II).

5.2.5 Assessment Criteria and Assignment of Significance

The information gathered from desk study and the suite of targeted ecological surveys was used to prepare an EcIA for the Project. The EcIA has been undertaken in accordance with the following guidelines which were used to derive valuation and assessment criteria as set out in Tables 5.1 and 5.2.

Section 3.7.3 of the Environmental Protection Agency's (EPA) *Guidelines on the Information to be contained in Environmental Impact Assessment Reports* (2022) note that "*where more specific definitions exist within a specialised factor or topic e.g. biodiversity, these should be used in preference to these generalised definitions*". The EcIA has been undertaken following the methodology set out in *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine* (CIEEM, 2018); and with reference to the National Roads Authority *'Guidelines for Assessment of Ecological Impacts of National Road Schemes*' (NRA, 2009); *EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports* (EPA 2022); and *BS 42020:2013 Biodiversity: Code of practice for planning and development* (BSI, 2013).

EcIA is based upon a source-pathway-receptor model, where the source is defined as the individual elements of the Project that have the potential to affect identified ecological features. The pathway is defined as the means or route by which a source can affect the ecological features. An ecological receptor is the feature of interest, being a species, habitat or ecologically functioning unit of natural heritage importance. Each element can exist independently however an effect is created where there is a linkage between the source, pathway and feature. A significant effect is defined in CIEEM (2018) as:

> "*an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' [...] or for biodiversity in general. Conservation objectives may be specific (e.g. for a designated site) or broad (e.g. national/local nature conservation policy) or more wide-ranging (enhancement of biodiversity). Effects can be considered significant at a wide range of scales from international to local*".
>
> and
>
> "*an effect that is sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of permitting a project. A significant effect is a positive or negative ecological effect that should be given weight in judging whether to authorise a project: it can influence whether permission is given or refused and, if given, whether the effect is important enough to warrant conditions, restrictions or further requirements such as monitoring*".

BS 42020:2013 states that if an effect is sufficiently important to be given weight in the planning balance or to warrant the imposition of a planning condition, e.g. to provide or guarantee necessary mitigation measures, it is likely to be "significant" in that context at the level under consideration. The converse is also true: insignificant effects would not warrant a refusal of permission or the imposition of conditions.

Likely significant effects are predicted on the basis of the Project as described in Chapter 3 of the EIAR. Table 5.1 includes a geographic frame of reference and criteria for valuing ecological features. Table 5.2 sets out criteria for predicting magnitudes of effect. These tables have been prepared with due regard to CIEEM, EPA and NRA guidelines.

Significant impacts are moderate or major effects which require counterbalancing mitigation measures to offset their adverse effects. Beneficial effects do not require mitigation measures as their effects are welcomed.

Table 5.1: Ecological Valuation Criteria for Ecological Features

Value	Criteria
International	• 'European Sites' including Special Areas of Conservation (SAC) & Special Protection Areas (SPA) • Sites that satisfy the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive) • Features essential to maintaining the coherence of the Natura 2000 Network • Sites containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive • Resident or regularly occurring populations (assessed to be important at the international level) of the following: • Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or • Species of animal and plants listed in Annex II and/or IV of the Habitats Directive • Ramsar Sites • World Heritage Sites • Sites hosting significant populations of species under the Bonn Convention • Sites hosting significant populations of species under the Berne Convention
National	• Wildlife Refuge for species protected under the Wildlife Acts • Resident or regularly occurring populations (assessed to be important at the national level) of the following: • Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or • Species of animal and plants listed in Annex II and/or IV of the Habitats Directive • Natural Heritage Areas (NHA) or proposed NHA (pNHA) • National Nature Reserves (NNR) • Marine Nature Reserve (MNR)
County	• Sites listed as part of the Ecological Network in the County Development Plan (CDP) • Areas subject to a Tree Preservation Order in a CDP • Resident or regularly occurring populations (assessed to be important at the County level) of the following • Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive • Species of animal and plants listed in Annex II and/or IV of the Habitats Directive • Species protected under the Wildlife Acts (1976-2018) and/or • Species listed on the relevant Red Data list • Sites containing areas of the habitat types listed in Annex I of the Habitats Directive that occur outside of designated International (SAC/SPA/Ramsar) or National (NHA/pNHA) sites • Regionally important populations of species or viable areas of semi-natural habitats or natural heritage features identified in a Biodiversity Action Plan (BAP) prepared for an administrative area, if this have been prepared • Sites containing natural habitat types with high biodiversity in a regional context and a high degree of naturalness, or populations of species that are uncommon within the County
Local	• Locally important populations of a priority or protected species; or habitats or features of natural heritage importance identified in a BAP, if this has been prepared • Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality • Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value
Site	• Sites containing small areas of semi-natural habitat that are of limited local importance for wildlife

Table 5.2: Magnitudes of Effect upon Ecological Features

Impact Significance	Magnitude of Effect	Criteria
Significant negative effect	Major adverse	• Loss of, permanent damage to or adverse impact on any part of a site of international or national importance; • Loss of a substantial part or key feature of a site of regional importance; • Loss of favourable conservation status (FCS) of a legally protected species; • Loss of or moderate damage to a population of nationally rare or scarce species.
	Moderate adverse	• Temporary disturbance to a site of international or national importance, but no permanent damage; • Loss of or permanent damage to any part of a site of regional importance; • Loss of a key feature of local importance; • A substantial reduction in the numbers of legally protected species such that there is no loss of FCS but the population is significantly more vulnerable; • Reduction in the amount of habitat available for a nationally rare or scarce species, or species that are notable at a regional or county level.
	Minor adverse	• Temporary disturbance to a site of regional value, but no permanent damage; • Loss of, or permanent damage to, a feature with some ecological value in a local context but that has no nature conservation designation; • A minor impact on legally protected species but no significant habitat loss or reduction in FCS; • A minor impact on populations of nationally rare or scarce species or species that are notable at a regional or county level.
No Significant Effect	Negligible	• No impacts on sites of international, national or county importance; • Temporary disturbance or damage to a small part of a feature of local importance; • Loss of or damage to land of negligible nature conservation value; • No reduction in the population of legally protected, nationally rare, nationally scarce or notable (regional level) species on the site or its immediate vicinity. • Beneficial and adverse impacts balance such that resulting impact has no overall affect upon feature.
Significant positive effect	Minor beneficial	• A small but clear and measurable gain in general wildlife interest, e.g. small-scale new habitats of wildlife value created where none existed before or where the new habitats exceeds in area that habitats lost.
	Moderate beneficial	• Larger new scale habitats (e.g. net gains over 1 ha in area) created leading to significant measurable gains in relation to the objectives of biodiversity action plans.
	Major beneficial	• Major gains in new habitats (net gains of at least 10 ha) of high significance for biodiversity being those habitats, or habitats supporting viable species populations, of national or international importance cited in Annexes I and II of the habitats Directive or Annex I of the Birds Directive.

5.2.6 Habitats Directive Appraisals

A Screening for Appropriate Assessment has been prepared by RPS in support of the Project to assist the competent authority in fulfilling its duties in accordance with Part XAB of the Planning and Development Acts 2000 to 2015 which transposes certain aspects of Article 6(3) and 6(4) of the Habitats Directive 92/43/EEC. These documents accompany the EIAR.

Impacts upon European Sites are also discussed within this chapter of the EIAR.

5.3 Baseline Scenario

5.3.1 Designated Sites and Features of Natural Heritage Importance

The study area is located within proximity to a number of sites designated on account of their natural heritage importance. This includes the Grand Canal pNHA and the Liffey at Osberstown pNHA. These sites are illustrated at Figure 5.2 Designated Sites and Features of Natural Heritage Importance (Volume III). A number of further sites are significantly spatially separated from the Project or are hydrologically linked to the proposals.

Table 5.3 below provides descriptive details of designated sites and features of natural heritage importance located within the site of the Project; within immediate proximity to the site of the proposed Project; or outside the site of the proposed Project but connected to it through an identifiable impact pathway.

Table 5.3: Designated Sites & Features of Natural Heritage Importance

Designated Site/Feature	Distance from Site (km)	Description
Grand Canal pNHA [002104]	0.63	Man-made watercourse with associated riparian habitats, smooth newt *Lissotriton vulgaris* populations, importance for otter and populations of opposite-leaved pondweed *Groenlandia densa.*
Liffey at Osberstown pNHA [001395]	0.8	Steep riverbank with former populations of rare plant species including dark-leaved willow *Salix myrsinifolia* and variegated horsetail *Equisetum variegatum*.
Mouds Bog SAC [002331]	5.1	Active raised bogs [7110] Degraded raised bogs still capable of natural regeneration [7120] Depressions on peat substrates of the Rhynchosporion [7150]
Mouds Bog pNHA [000395]	5.1	As above.
South Dublin Bay SAC [000210]	34.7 58 by hydrological connection	Mudflats and sandflats not covered by seawater at low tide [1140] Annual vegetation of drift lines [1210] Salicornia and other annuals colonising mud and sand [1310] Embryonic shifting dunes [2110]
North Dublin Bay SAC [000206]	34.7 58 by hydrological connection	Mudflats and sandflats not covered by seawater at low tide [1140] Annual vegetation of drift lines [1210] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] Mediterranean salt meadows (*Juncetalia maritimi*) [1410] Embryonic shifting dunes [2110] Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] Humid dune slacks [2190] *Petalophyllum ralfsii* (Petalwort) [1395]
South Dublin Bay and River Tolka Estuary SPA [004024]	34.7 58 by hydrological connection	Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] Oystercatcher (*Haematopus ostralegus)* [A130] Ringed Plover (*Charadrius hiaticula)* [A137] Grey Plover (*Pluvialis squatarola*) [A141] Knot (*Calidris canutus*) [A143] Sanderling (*Calidris alba*) [A144] Dunlin (*Calidris alpina*) [A149] Bar-tailed Godwit (*Limosa lapponica*) [A157] Redshank (*Tringa totanus*) [A162] Black-headed Gull (*Chroicocephalus ridibundus*) [A179] Roseate Tern (*Sterna dougallii*) [A192] Common Tern (*Sterna hirundo*) [A193] Arctic Tern (*Sterna paradisaea*) [A194] Wetland and Waterbirds [A999]

North Bull Island SPA [004006]	34.7 58 by hydrological connection	Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] Shelduck (*Tadorna tadorna*) [A048] Teal (*Anas crecca*) [A052] Pintail (*Anas acuta*) [A054] Shoveler (*Anas clypeata*) [A056] Oystercatcher (*Haematopus ostralegus*) [A130] Golden Plover (*Pluvialis apricaria*) [A140] Grey Plover (*Pluvialis squatarola*) [A141] Knot (*Calidris canutus*) [A143] Sanderling (*Calidris alba*) [A144] Dunlin (*Calidris alpina*) [A149] Black-tailed Godwit (*Limosa limosa*) [A156] Bar-tailed Godwit (*Limosa lapponica*) [A157] Curlew (*Numenius arquata*) [A160] Redshank (*Tringa totanus*) [A162] Turnstone (*Arenaria interpres*) [A169] Black-headed Gull (*Chroicocephalus ridibundus*) [A179] Wetland and Waterbirds [A999]

5.3.2 Desk Study

A search of the existing records held by NBDC was undertaken. The search area was customised i.e. a 'user-defined' polygon was drawn capturing all records within approximately 1km^2 of the site. The output data (species list) was refined to include those afforded protection under national and international legislation. Also presented are species which have been assessed following International Union for the Conservation of Nature (IUCN) categories and criteria, and guidelines for their application.

This user-defined polygon and refined output species list are presented in Appendix 5.1, Volume II.

Records returned include:

- A number of records of common frog *Rana temporaria* the most recent of which being from 2019.
- A range of earthworm and other annelid species.
- A range of crustacean species, including the Annex II species White-clawed crayfish *Austropotamobius pallipes* returned from within the River Liffey, downstream of the Project.
- A wide range of flowering plants, none of which were noted to be of conservation importance, in addition to a range of non-native invasive species.
- A range of records of butterflies including marsh fritillary *Euphydryas aurinia* of which 22 records were held, the most recent being from 2010, in addition to other species of conservation concern including dark green fritillary *Argynnis aglaja,* dingy skipper *Erynnis tages,* grayling *Hipparchia semele,* large heath *Coenonympha tullia,* small heath *Coenonympha pamphilus* and wall *Lasiommata megera*, all of which were historical recorded over 30 years old.
- A wide range of further insects of which only a small number were listed as being of conservation concern, with the majority of these records being over 25 years old.
- A limited range of common and widespread liverwort species.
- A range of molluscs including a number of invasive mollusc species;
- Records of otter, the most recent of which being from 2017;
- Low numbers of records for a limited range of bats species including soprano pipistrelle *Pipistrellus pygmaeus,* common pipistrelle *Pipistrellus pipistrellus,* Natterer's bat *Myotis nattereri,* Daubenton's bat *Myotis daubentoniid,* brown long-eared *Plecotus auritus* and Leisler's bat *Nyctalus leisleri*.
- A large number of records of hedgehog *Erinaceus europaeus,* the most recent of which from 2021.
- Records of badger *Meles meles* the most recent of which from 2016.

- Records of a range of non-native mammal species including mink *Mustela vison,* muntjac *Muntiacus reevesi,* hazel dormouse *Muscardinus avellanarius,* grey squirrel *Sciurus carolinensis* and greater white-toothed shrew *Crocidura russula,* among others.
- A large number of bird records including a number of species of conservation concern including barn owl *Tyto alba,* curlew *Numenius arquata,* lapwing *Vanellus vanellus* and yellowhammer *Emberiza citrinella* among a further range of amber and red listed species.

5.3.3 Habitats

All habitats recorded within the site are described individually below and are illustrated on the accompanying Figure 5.3: Extended Phase 1 Habitat Survey (Volume III).

5.3.3.1 Improved Agricultural Grassland

The vast majority of the site is comprised of improved agricultural grassland which has been subject to some reseeding and nutrient enrichment. These fields are subject to sheep grazing and are species poor.

Species present within this habitat include perennial rye-grass *Lolium perenne,* red fescue *Festuca rubra,* crested dog's-tail *Cynosurus cristatus,* Yorkshire fog *Holcus lanatus,* smooth meadow-grass *Poa pratensis,* white clover *Trifolium repens,* red clover *Trifoilium pratense,* broad-leaved dock *Rumex obtusifolius,* common sorrel *Rumex acetosa,* creeping thistle *Cirsium arvense,* spear thistle *Cirsium vulgare,* dandelion *Taraxacum officinale agg.,* creeping buttercup *Ranunculus repens,* meadow buttercup *Ranunculus acris,* common field speedwell *Veronica persica* and ragwort *Senecio jacobaea*.

Small patches of this habitat (less than 40m^2), in the south-west of the site, support relatively dense yellow rattle *Rhinanthus minor*, which is not present in any other areas of the site and is present within areas of habitat which are otherwise fairly species poor.

This habitat is considered to be of **site-level** ecological value.

5.3.3.2 Amenity Grassland

Small areas of amenity grassland habitat are present within the gardens of residential properties along the northern boundary of the Project site, these are subject to regular mowing and are species-poor, dominated by perennial rye-grass with red fescue, white clover an a limited range of typical species.

This habitat is considered to be of **site-level** ecological value.

5.3.3.3 Dry Neutral Grassland

A large proportion of the site is comprised of semi-improved neutral grasslands which are dry and sheep grazed. They appear to have been subject to some limited agricultural improvement, including nutrient enrichment and reseeding. These areas are however generally less improved than those areas of improved agricultural grassland which comprise the majority of the remainder of the site with a higher variability in the dominant grass species and a higher proportion of forbs within the sward. The vast majority of these areas remain species poor.

Species present include perennial rye-grass, red fescue, crested dog's-tail, Yorkshire fog, smooth meadow grass, sweet vernal grass *Anthoxanthum odoratum,* cock's-foot *Dactylis glomerata,* false oat-grass *Arhennatherum elatius,* timothy *Phleum pratense,* meadow foxtail *Alopecurus pratensis,* creeping bent *Agrostis stolonifera,* common bent *Agrostis capillaris,* soft rush *Juncus effusus,* hard rush *Juncus inflexus,* field wood-rush *Luzula campestre,* creeping buttercup, meadow buttercup, common field speedwell, germander speedwell *Veronica chamaedrys,* creeping thistle, spear thistle, white clover, red clover, daisy, broad-leaved dock, common sorrel, daisy *Bellis perennis,* bird's-foot trefoil *Lotus corniculatus,* meadow vetchling *Lathyrus pratensis,* dandelion, common nettle *Urtica dioica,* silverweed *Argentina anserina,* field horsetail *Equisetum arvense* and lesser stitchwort *Stellaria graminea*.

This habitat is considered to be of **site-level** ecological value.

5.3.3.4 Dry Meadows and Grassy Verges

Areas of unmanaged grasslands not subject to grazing are present in small areas around the site including the margins of the site along roads and around the farmyard. These are typically rank and species poor.

Species present within these areas include a limited range of those recorded within adjacent agricultural grasslands including dominant false oat-grass, spear thistle, creeping thistle, broadleaved dock and areas of tall ruderal vegetation generally comprised of common nettle.

These habitats are considered to be of **site-level** ecological value.

5.3.3.5 Wet Grassland

Relatively small areas of the site inclusive of fields in the east and south of the site support wetter grasslands which have been subject to minimal agricultural improvement and are sheep grazed at a lower intensity. As such these areas are characterised by an abundance of rushes largely absent from other grasslands within the site. These areas are more species rich than other grasslands within the site.

Species present include perennial rye-grass, red fescue, Yorkshire fog, tufted hair-grass *Deschampsia cespitosa,* cock's-foot, false oat-grass, wavy hair-grass *Deschampsia flexuosa,* meadow foxtail, creeping bent, common quaking -grass *Briza media,* soft rush, sharp-flowered rush *Juncus acutiflorus,* hard rush, common sedge *Carex nigra,* oval sedge *Carex 11anicula,* creeping buttercup, meadow buttercup, germander speedwell, marsh thistle *Cirsium palustre,* creeping thistle, common nettle, meadowsweet *Filipendula ulmaria,* cleavers *Galium aparine,* greater bird's-foot trefoil *Lotus pedunculatus*, meadow vetchling, white clover, common sorrel, broadleaved dock, silverweed, field horsetail, lesser stitchwort, marsh woundwort *Stachys palustris,* common spotted orchid *Dactylorhiza 11anicul,* wild angelica *Angelica sylvestris,* yellow flag iris *Iris pseudacorus,* floating sweet-grass *Glyceria fluitans* and greater tussock-sedge *Carex 11aniculate*.

These areas are considered to be of relatively high ecological value in the context of the site and are considered to be of importance at the **local level**.

5.3.3.6 Large Sedge Swamps

Two relatively large areas of tall sedge swamp habitat are present in the south and south-east of the site and are characterised by dominant greater tussock-sedge, with other vegetation being extremely limited in these areas including occasional purple moor grass *Molinia caerulea*.

These habitats are species poor but likely to be uncommon in a local context and are therefore considered to be of ecological value at the **local level**.

5.3.3.7 Tilled Land

A relatively small proportion of the site, inclusive of half a field in the south-west of the site, is managed as an annual crop, including as game cover. This area was not recently tilled at the time of the most recent survey and had been reseeded with a cereal crop but has been extensively recolonised by redshank *Persicaria maculosa* and marsh woundwort *Stachys palustris*.

This habitat is considered to be of **site level** ecological value.

5.3.3.8 Scattered Trees / Orchard

A derelict former kitchen garden is present to the west of farm buildings in the centre of the site. This area supports scattered trees with underlying rank grassland, tall ruderal vegetation and bramble *Rubus fruticosus* scrub.

Trees species include apple *Malus domestica,* damson *Prunus domestica subsp. Insititia*, plum *Prunus domestica,* pear *Pyrus communis,* hazel *Corylus avellana* and self-sown grey willow *Salix cinerea,* silver birch *Betula pendula,* sycamore *Acer pseudoplatanus* and ash *Fraxinus excelsior*.

This habitat is likely to be uncommon in the local context and is considered to be of ecological importance at the **local level**.

5.3.3.9 Scrub

The site supports a number of areas of scrub which are unmanaged and are dominated by bramble with occasional scattered immature trees including hawthorn *Crataegus monogyna,* blackthorn *Prunus spinosa,* gorse *Ulex europaeus,* birch and ash.

These areas are of limited intrinsic ecological value and are considered to be of ecological importance at the **site level**.

5.3.3.10 Buildings

The site supports a range of buildings including a number of farm buildings and derelict dwellings in the central area of the site, in addition to a number of dwellings and associated outbuildings along the northern site boundary.

These features are considered to be of **negligible** intrinsic ecological value.

Several of these buildings have potential to support roosting bats and support nesting birds, namely swallows *Hirundo rustica*. The characteristics of each building and an assessment of their potential to support individual bats is set out within the accompanying Ecological Survey for Bats (Appendix 5.2, Volume II).

5.3.3.11 Hardstanding

Areas of hardstanding are present within the site and are inclusive of areas of farm tracks, farmyard, access roads and car parking around dwellings.

These areas are largely devoid of vegetation and are considered to be of **negligible** ecological value.

5.3.3.12 Drainage Ditches

The site supports a number of seasonally wet drainage ditches, along the margins of agricultural fields and in association with adjacent hedgerows. These features are shallow, slow flowing and dry out on a regular basis. These features support fairly minimal aquatic vegetation including reedmace *Typha latiifolia,* yellow flag iris and floating sweet-grass.

These features are considered to be of **site-level** ecological importance.

5.3.3.13 Lowland River

A single minor watercourse, the Bluebell Stream, is present along the southern boundary of the Project site. This watercourse is fairly narrow (less than 2m wide) and supports slow flowing conditions with a fairly uniform U-shaped channel and is well vegetated at the margins. For much of its length, within the survey area, the watercourse was assessed as having characteristics of a well-fed field drain. The watercourse is culverted under the M7 to the east of the Project site boundary.

Significant lengths of the watercourse are entirely covered by vegetation including common reed *Phragmites australis,* reed canary-grass *Phalaris arundinacea,* lesser water parsnip *Berula erecta* and floating sweet-grass.

This feature is considered to be of relatively higher ecological value in the context of the site and is likely to be of ecological importance at the **local level**.

5.3.3.14 Amenity Planting

Gardens, present along the northern boundary of the Project site, support areas of amenity planting inclusive of a range of native and non-native vegetation which is subject to regular management. This includes flower beds and borders and wide bands of non-native scrub and trees.

These areas are considered to be of fairly minimal ecological value and of importance at the **site level**.

5.3.3.15 Hedgerows

The site supports a large number of hedgerows, delineating the boundaries of agricultural fields and residential properties.

These features are of variable composition with the vast majority being comprised of native species and subject to minimal management.

Hawthorn is the primary species with the vast majority of the hedgerows being predominately comprised of this species. Other species include oak *Quercus robur,* sessile oak *Quercus petraea,* holm oak *Quercus ilex,* hazel, blackthorn, elder *Sambucus nigra,* grey willow, crack willow *Salix fragilis,* alder *Alnus glutinosa,* aspen *Populus tremula,* silver birch *Betula pendula,* Scot's pine *Pinus sylvestris,* Monterey pine *Pinus radiata,* ash, wild cherry *Prunus avium,* horse chestnut *Aesculus hippocastanum,* holly *Ilex aquifolium,* beech *Fagus sylvatica,* elm *Ulmus glabra,* field maple *Acer campestre,* apple *Malus sylvestris,* spindle *Euonymus europaeus* and sycamore.

The vast majority of these features support occasional standard mature trees, typically ash, oak or sycamore.

Some non-native hedgerows are present around residential dwellings along the northern boundary of the Project site and are comprised of leylandii *Cupressus leylandii,* lawson cypress *Chamaecyparis lawsoniana,* sitka spruce *Picea stitchensis* and cherry laurel *Prunus laurocerasus*.

With the exception of non-native hedgerows which are considered to be of low ecological value, the vast majority of hedgerows within the site are of relatively greater ecological value within the context of the site and are considered to be of importance at the **county level**.

5.3.3.16 Treelines

The site supports several lines of continuous mature trees which are representative of the habitat treelines. These features typically support underlying hedgerow vegetation which is not continuous and has been subject to some level of shading.

These features include lines of mature beech, ash, sycamore and oak which typically support underlying hawthorn. A number of trees within these hedgerows are likely to represent veteran trees, limited to a number of mature oak within the central and eastern areas of the site.

These features are considered to be of relatively higher ecological value in the context of the site and are of importance at the **county level**.

5.3.3.17 Scattered Trees

The site supports a number of broadleaved and coniferous scattered trees, planted within areas of agricultural grassland or as part of amenity planting within gardens. These include a number of horse chestnut trees and a number of ornamental cedars *Cedrus atlantica*.

These features are considered to be of **site level** ecological value.

5.3.4 Protected Species

5.3.4.1 Badger

The site was not recorded to support any evidence indicating the presence of badger *Meles meles*. While a large number of mammal burrows are present on site these were attributed to either rabbit *Oryctolagus cuniculus* or fox *Vulpes vulpes*.

No forage signs, latrines or other field signs attributable to badger were recorded within the site. It is therefore considered that the species is not present within the site. The species is therefore not considered further within this assessment.

5.3.4.2 Otter

The watercourse along the southern boundary of the Project site and lengths within 200m to the west of the site were subject to searches for evidence indicating the presence of otter.

No holts, dens, slides, spraint or other signs indicating the presence of otter were recorded during the surveys. While it is likely that the species utilises the Bluebell Stream on at least an occasional basis as part of a wider territory, it is considered that the site is of no particular significance for the species.

5.3.4.3 Birds

The site was recorded to support a range of common and widespread breeding bird species typical of agricultural land in the wider area.

Species recorded within the site include robin *Erithacus rubecula,* dunnock *Prunella modularis,* wren *Troglodytes troglodytes,* blue tit *Cyanistes caeruleus,* great tit *Parus major,* coal tit *Periparus ater,* long-tailed tit *Aegithalos caudatus,* chaffinch *Fringilla coelebs,* goldfinch *Carduelis carduelis,* bullfinch *Pyrrhula pyrrhula,* goldcrest *Regulus regulus,* willow warbler *Phylloscopus trochilus,* chiffchaff *Phylloscopus collybita,* sedge warbler *Acrocephalus schoenobaenus,* black bird *Turdus merula,* song thrush *Turdus philomelos,* mistle thrush *Turdus viscivorus,* wood pigeon *Columba palumbus,* collared dove *Streptopelia decaocto,* pheasant *Phasianus colchicus,* barn swallow *Hirundo rustica,* starling *Sturnus vulgaris,* magpie *Pica pica,* jackdaw *Corvus monedula,* rook *Corvus frugilegus,* hooded crow *Corvus cornix,* jay *Garrulus glandarius,* herring gull *Larus argentatus,* sparrowhawk *Accipiter nissus* and buzzard *Buteo buteo*.

Farm buildings in the centre of the site were recorded to support numbers of nesting swallow (approximately 5 pairs), while the unoccupied dwelling in the north-east of the site was recorded to support nesting jackdaw.

While habitats within the site including wet grasslands and sedge swamp have some limited potential to support breeding waders such as snipe, repeat visits to the site within the breeding wader season, in association with bat activity surveys, did not record the presence of any waders within the site boundary.

5.3.4.4 White-clawed Crayfish

As set out above, several records of white-clawed crayfish were returned from NBDC from within proximity to the Project. These included on the River Liffey both upstream and downstream of its confluence with the Bluebell Stream.

The Bluebell Stream is considered to offer extremely limited potential for white-clawed crayfish, this is due to its relatively shallow depth which is likely subject to significant flood flows, the fairly uniform U-shaped nature of the channel, the absence of larger substrates within the channel including an absence of boulders, cobbles or artificial substrates which act as refuges for the species, the predominance of fine organic silt comprising the channel bed and the modified nature of the channel which has been culverted under the M7. All of these characteristics are considered to be unfavourable for the species (S. Peay 2002) and it is considered highly unlikely that the species is present within this watercourse.

All other waterbodies on site are drainage ditches which are known to dry up on a regular basis and as such do not represent suitable potential habitat for this species.

It is therefore considered that the species is unlikely to be present on site.

5.3.4.5 Smooth Newt and other Amphibian Species

The single watercourse within the site, being a flowing waterbody, is unsuitable to support smooth newt *Lissotriton vulgaris,* or other amphibian species. Furthermore, drainage ditches within the site are known to dry up on a regular basis, as observed during surveys undertaken of the site in 2022 and 2023. As such it is considered that such features have extremely limited potential to support breeding amphibians and it is therefore considered that smooth newt are absent from the site.

5.3.4.6 Bats

The site has been subject to a range of surveys to establish the baseline situation in respect of bats including ground-based preliminary roost assessment, potential roost-feature surveys, bat activity surveys, and emergence/re-entry surveys of structures and trees. The full extent of these surveys is set out within the accompanying Ecological Survey for Bats (Appendix 5.2, Volume II) and findings illustrated on the accompanying Figure 5.4 Protected Species (Volume III). The findings of these surveys are summarised below.

Activity surveys of the site were undertaken on four separate occasions, in May, mid-June, late-June and early August. These surveys recorded lower activity levels than anticipated, inclusive of four principal species including Leisler's bat, common pipistrelle, soprano pipistrelle and a *Myotis* species. Activity levels were overall fairly low throughout the site and dropped as the season progressed. Brown long-eared were also recorded to forage within the site however no registrations of this species were recorded during activity surveys.

A total of 20 trees on site were assessed as supporting potential roost features based on a ground-based preliminary assessment. All of these trees were subject to tree-climbing PRF inspection survey on two occasions which determined the following:

- A total of six trees were downgraded to Negligible bat roosting suitability due to a lack of cavity size and shelter.
- Two were downgraded to Low bat roosting suitability due to a lack of cavity size and/or exposure.
- Two trees were upgraded to High bat roosting suitability due to them both supporting larger cavities with suitable characteristics to provide roosting habitat for a larger number of bats such as a maternity colony.
- The remaining 9 trees remained as having Moderate bat roosting suitability with a further cone remaining at Low bat roost suitability.

Two trees, both of which could not be fully inspected during endoscope surveys, due to the depth of the potential roost features or the presence of nesting birds, were subject to emergence surveys using night vision aided infra-red cameras.

No trees within the site were recorded to support roosting bats.

Of the buildings present on site, six were deemed to support features offering potential for roosting bats. These included the disused dwellings and a number of outbuildings within the farm in the centre of the site in addition to the unoccupied bungalow in the north-east of the site and the associated garage. Of these structures one was considered to offer low bat roosting potential while the remainder were classed as moderate. Emergence surveys of these structures recorded the presence of two roosts within a single building within the central farmyard comprising two separate day roosts for a single myotis bat (considered likely to be a Daubenton's bat) within an agricultural storage shed. In addition, several buildings were recorded to support foraging activity.

Both these recorded roosts are considered likely to be of fairly limited conservation significance in the context of the local bat population.

While the site was initially assessed as having potential to support moderate to high bat activity levels, given the supported hedgerows and treelines in association with grazed agricultural grasslands, in addition to a range of structures with potential to support roosting bats, surveys have recorded lower levels of activity than initially expected with correspondingly limited roosting activity record within the site.

5.4 Impact Assessment

5.4.1 Assessment of Construction Effects

5.4.1.1 Designated Sites and Features of Natural Heritage Importance

The Project at the construction stage will involve no works within or in proximity to any site designated on account of its natural heritage interest. Furthermore, the Project site is sufficiently distant from designated sites in the locality to ensure that no indirect effects upon these sites will arise as a result of the proposals.

As set out above the site is hydrologically connected to a number of European sites within Dublin Bay, via the Bluebell Stream and the River Liffey, including the South Dublin Bay SAC and North Dublin Bay SAC and the South Dublin Bay and River Tolka Estuary SPA and North Bull Island SPA.

The Project is located at a distance of 34.7km from each of these European sites (straight-line distance) and is linked to them by a hydrological pathway approximately 58km in length. Proposed works which will take place within 10m of the Bluebell Stream, and thus linked to the sites, will be limited to the proposed temporary open cut watercourse crossing required in order to facilitate the delivery of the foul sewer and fibre cable connection in addition to the installation of a culvert to facilitate delivery of the secondary site access and any associated works.

These works, with potential to directly impact upon the watercourse, are extremely limited and small-scale in nature and will be undertaken in line with best practice measures in dry conditions following fluming of the relevant lengths of watercourse.

The construction phase will also involve significant earth works to facilitate site levelling and the creation of Sustainable Drainage Systems (SuDS). Such works have potential to result in adverse impacts upon the aquatic environment through the inadvertent release of such materials into the Bluebell Stream. Given that the stream is in places more akin to a large field drain, it is considered highly likely that such released sediments would be deposited quickly and not borne downstream in suspension. Over the 58km pathway separating the site and downstream European sites it is considered that any sediments or pollutants arising as a result of the Project would be subject to deposition or dilution within the large volumes of water within the River Liffey prior to discharge to Dublin Bay itself.

Significant mixing of seawater occurs in Dublin Bay with freshwater flowing in from the surrounding river catchments. The mixing of any polluting materials that nonetheless escape to the marine environment as a result of the Project will be further aided by the tidal currents, wind and wave climate which transport and continue to mix the seawater and freshwater (and any polluting substances) both into and out of the Liffey Estuary, and help it disperse widely and dilute to much lower concentrations throughout Dublin Bay to the point where it cannot be detected above background levels. On this basis any potential minor inputs arising as a result of the Project are highly likely to be undetectable at the point at which any such materials reach any European sites which lie at distances greater than 58km downstream of the Project.

It is considered therefore that such works have no potential to give rise to the release of sediments, pollutants, or other materials sufficient to cause a measurable effect upon the downstream European sites within Dublin Bay. This conclusion is drawn in light of the small-scale nature of the works, the length of the hydrological pathway, the nature of the Liffey catchment which is already subject to significant input of sediments and other materials through agriculture, industry and other diffuse inputs, in addition to the nature of the relevant European sites which are not designated on account of qualifying interests which are known to be sensitive to impacts associated with sedimentation or minute changes in water quality, effects which are nonetheless not anticipated to occur as a result of the Project.

The Project will therefore have no potential to give rise to likely significant construction phase effects upon the South Dublin Bay SAC, North Dublin Bay SAC, South Dublin Bay and River Tolka Estuary SPA and North Bull Island SPA, or any further sites designated on account of their natural heritage interests. Effects are predicted to be **negligible** and **not significant**.

5.4.1.2 Habitats

5.4.1.2.1 Improved Agricultural Grassland

The Project will give rise to the loss of an estimated 20.1ha of improved agricultural grassland, at construction phase. Given the species-poor nature of this habitat it is considered that effects associated with the loss of these areas of habitat would be **negligible** and **not significant**.

5.4.1.2.2 Amenity Grassland

The Project will give rise to the loss of an estimated 0.4ha of amenity grassland of site-level ecological value in order to facilitate the Project, at construction phase. It is considered that effects associated with the loss of these areas of habitat would be **negligible** and **not significant**.

5.4.1.2.3 Dry Neutral Grassland

The Project will give rise to the loss of an estimated 10.1ha of species-poor dry neutral grassland at construction phase. While this habitat is relatively species-poor it is less so than typical agricultural grasslands and the area proposed to be lost is fairly large. As such it is considered that effects associated with the loss of these areas of habitat would be **minor adverse** and **significant**.

5.4.1.2.4 Dry Meadows and Grassy Verges

The Project, at construction phase, will give rise to the loss of an estimated 0.58ha of dry meadows/grassy verges considered to be of site-level ecological value. It is considered that effects associated with the loss of these areas of habitat would be **negligible** and **not significant**.

5.4.1.2.5 Wet Grassland

The Project, at construction stage, will give rise to the loss of an estimated 2.3ha of wet grassland considered to be of importance at the local level. It is considered that effects associated with the loss of these areas of habitat would be **minor adverse** and **significant**.

5.4.1.2.6 Large Sedge Swamps

The Project will give rise to the loss of an estimated 0.44ha of large sedge swamp considered to be of ecological value at the local level. It is considered that effects associated with the loss of these areas of habitat would be **minor adverse** and **significant**.

5.4.1.2.7 Tilled Land

The Project will give rise to the loss of an estimated 1.16ha of tilled land considered to be of negligible ecological value. Impacts are predicted to be **negligible** and **not significant**.

5.4.1.2.8 Orchard

The Project will give rise to the loss of an estimated 0.22ha of unmanaged former orchard considered to be of ecological importance at the local level. It is considered that effects associated with the loss of these areas of habitat would be **minor adverse** and **significant**.

5.4.1.2.9 Scrub

The Project will give rise to the loss of an estimated 0.46ha of scrub considered to be of ecological importance at the site level. Impacts are predicted to be **negligible** and **not significant**.

5.4.1.2.10 Buildings

The Project will give rise to the loss of a variety of buildings all of which are considered to be of negligible intrinsic ecological importance. Impacts are predicted to be **negligible** and **not significant**.

5.4.1.2.11 Hardstanding

The Project will give rise to the loss of an estimated 0.93ha of hardstanding of negligible ecological value. Impacts are predicted to be **negligible** and **not significant**.

5.4.1.2.12 Drainage Ditches

The site supports a number of seasonally wet drainage ditches considered to be of site-level ecological importance. Effects associated with the loss of approximately 1.7km of these features is considered to be **negligible** and **not significant**.

5.4.1.2.13 Lowland River

A single minor watercourse, the Bluebell Stream, is present along the southern boundary of the Proejct site and is considered to be of relatively higher ecological value in the context of the site and of ecological importance at the local level. This watercourse is to be retained within the Project however some works to the watercourse will be required, including the installation of fibre connection and foul sewer crossing in addition to the installation of a culvert, adjacent to an existing culvert under the M7 Road, to facilitate the construction of secondary site access.

These works are to be undertaken in dry conditions and will involve the temporary damming and fluming of the relevant short sections of watercourse to facilitate the proposed construction. Following completion of these aspects of the works temporary damming will be removed and the watercourse will be returned to its previous condition.

Further indirect effects upon this habitat at construction phase could arise through sedimentation, pollution and other water quality effects arising as a result of habitat clearance, cut and fill and other construction activities taking place within proximity to this watercourse.

Potential construction phase impacts to this habitat are therefore considered to be **minor adverse** and **significant** in the absence of mitigation measures.

5.4.1.2.14 Amenity Planting

The Project will give rise to the loss of an estimated 0.12ha of amenity planting within gardens in the north of the site considered to be of fairly minimal ecological value and of importance at the site level. Impacts associated with the loss of this habitat are predicted to be **negligible** and **not significant**.

5.4.1.2.15 Hedgerows

The site supports a large number of hedgerows considered to be of importance at the **county level**.

The Project, at construction phase, will give rise to the loss of around 1.3km of hedgerows, not inclusive of continuous treelines, described below. It is considered that such effects would be **moderate adverse** and **significant**.

5.4.1.2.16 Treelines

The site supports several continuous mature treelines considered to be of importance at the county level.

The Project, at construction phase, will give rise to the loss of approximately 1.6km of treelines. It is considered that such effects would be **moderate adverse** and **significant**.

5.4.1.2.17 Scattered Trees

A number of immature horse chestnut trees and ornamental cedars *Cedrus atlantica* are also to be lost as a result of the Project, of site-level ecological value. It is considered that the loss of these features would be **negligible** and **not significant**.

5.4.1.3 Protected Species

5.4.1.3.1 Otter

The Project will give rise to potential minor adverse impacts upon a minor watercourse which was not recorded as likely to be of any particular importance for otter.

It is considered that impacts arising as a result of the Project would be **negligible** and **not significant**.

5.4.1.3.2 Birds

The Project will give rise to the loss of a range of habitats including scrub, orchard, scattered trees, hedgerows and treelines with potential to support nesting birds, including a range of common and widespread species. Furthermore, buildings within the Project site were noted to support nesting starling, jackdaw and swallow.

It is not considered that the loss of habitats required in order to facilitate the Project would have potential to give rise to significant effects upon the local populations of bird species of conservation concern.

In the absence of mitigation, the construction stage of the Project has potential to impact upon nesting bird species, through the destruction of nests or disturbance caused during the proposed demolition of buildings and clearance of scrub, hedgerows, treelines and other vegetation.

Such impacts are considered to be **moderate adverse** and **significant** in the absence of mitigation.

5.4.1.3.3 White-clawed Crayfish

The Project will involve minor small-scale works to a single minor watercourse which was assessed as offering extremely poor habitat for white-clawed crayfish. It is considered highly unlikely that the species is present within the site.

Proposed works to the Bluebell Stream, limited to the installation of the proposed foul water and fibre connection, in addition to the installation of a culvert to facilitate secondary site access construction, will be undertaken in dry conditions with temporary damming and fluming of the relevant lengths of watercourse.

Given that the species is highly unlikely to be present within the relevant work areas and that the Project will be done in a manner which will not give rise to any significant impacts to the species or its associated habitats, it is not considered that there is significant potential for direct impacts to white-clawed crayfish associated with construction phase of the Project.

The species is known to be present within stretches of the River Liffey which lie approximately 3.2km downstream of the Project. It is considered that potential construction phase impacts to the freshwater environment, such as sedimentation and the inadvertent release of pollutants and contaminants would likely be largely subject to deposition within close proximity to the source. However, there is insufficient information available to conclude that such material would not give rise to measurable effects upon populations of this species which lie relatively close to and downstream of the Project. As the species is known to be sensitive to the effects of sedimentation, it is considered that such potentially measurable effects could give rise to **minor adverse** and **significant** in the absence of mitigation.

5.4.1.3.4 Bats

The Project will involve the loss of a single building, an agricultural shed, which was recorded to support two separate roost features, both used as day roosts by a single myotis bat. It is considered that the loss of these roost features, in the absence of mitigation, would give rise to a **moderate adverse** and **significant** effect.

The Project will also give rise to the loss of a number of trees with potential to support roosting bats. While no bats were recorded within potential roost features in these trees, they may nonetheless support roosting bats at the time of felling. As such, in the absence of mitigation, the proposals have potential to give rise to the loss of bat roosts likely to be of low conservation significance at construction stage, in the absence of mitigation. Such effects would, it is considered be **moderate adverse** and **significant**.

The Project will involve the removal of a relatively large area of grazed pastures and associated hedgerows and treelines which have been recorded to support relatively low numbers of foraging and commuting bats, largely comprising species which are known to be more common and widespread in the area. It is considered that these habitats are likely to be of local importance for this group. In the absence of mitigation the proposals would give rise to a **moderate adverse** and **significant** effect as a result of the loss of these foraging and commuting habitats for bats.

5.4.2 Assessment of Operational Effects

5.4.2.1 Designated Sites and Features of Natural Heritage Importance

The Project, at the operational stage, will be spatially separated from all designated sites of natural heritage importance.

As set out above the site is hydrologically connected to a number of European sites within Dublin Bay, via the Bluebell Stream and the River Liffey, including the South Dublin Bay SAC and North Dublin Bay SAC and the South Dublin Bay and River Tolka Estuary SPA and North Bull Island SPA. The Project is located at a distance of 34.7km from each of these European sites (straight-line distance) and is linked to them by a hydrological pathway approximately 58km in length.

Potential operational phase impacts to the aquatic environment are limited to those associated with pollution and sedimentation arising as a result of contaminated surface water run-off in addition to the inappropriate discharge of foul water into the aquatic environment. As set out above in respect of construction phase effects associated with the Project, it is considered highly likely that such released sediments or pollutants would be deposited quickly and not borne downstream in suspension. Over the 58km pathway separating the site and downstream European sites it is considered that any sediments or pollutants arising as a result of the Project

would be subject to deposition or dilution within the large volumes of water within the River Liffey prior to discharge to Dublin Bay itself.

Significant mixing of seawater occurs in Dublin Bay with freshwater flowing in from the surrounding river catchments. The mixing of any polluting materials that nonetheless escape to the marine environment as a result of the Project will be further aided by the tidal currents, wind and wave climate which transport and continue to mix the seawater and freshwater (and any polluting substances) both into and out of the Liffey Estuary, and help it disperse widely and dilute to much lower concentrations throughout Dublin Bay to the point where it cannot be detected above background levels. On this basis any potential minor inputs arising as a result of the Project are highly likely to be undetectable at the point at which any such materials reach any European sites which lie at distances greater than 58km downstream of the Project.

It is considered therefore that operational phase effects associated with surface water runoff and foul water have no potential to give rise to a measurable effect upon the downstream European sites within Dublin Bay. This conclusion is drawn in light of the small-scale nature of such potential inputs, the length of the hydrological pathway, the nature of the Liffey catchment which is already subject to significant input of sediments and other materials through agriculture, industry and other diffuse inputs, in addition to the nature of the relevant European sites which are not designated on account of qualifying interests which are known to be sensitive to impacts associated with sedimentation or minute changes in water quality, effects which are nonetheless not anticipated to occur as a result of the operational phase of the Project.

The Project will therefore have no potential to give rise to likely significant operational phase effects upon the South Dublin Bay SAC, North Dublin Bay SAC, South Dublin Bay and River Tolka Estuary SPA and North Bull Island SPA, or any further sites designated on account of their natural heritage interests. Effects are predicted to be **negligible** and **not significant**.

5.4.2.2 Habitats

The Project, which will not involve the loss of habitat or other potential impacts to habitats during operation, has no potential to give rise to any operational impacts upon terrestrial habitats within the site.

The operational phase of the Project, as discussed above, has potential to give rise to adverse impacts to lowland river habitat, limited to the Bluebell Stream, as a result of the inadvertent release of pollutants and sediments within surface water runoff and the inappropriate discharge of foul water from the Project at operational phase.

Impacts associated with such effects are considered to be **minor adverse** and **significant**.

No further operational phase impacts to habitats are considered to arise as a result of the Project.

5.4.2.3 Protected Species

5.4.2.3.1 Birds

The Project at operational phase has no potential to give rise to any impacts to bird populations within the site as no habitats will be lost or modified throughout operational use of the site.

Impacts are therefore considered to be **negligible** and **not significant**.

5.4.2.3.2 White-clawed Crayfish

The operational phase of the Project, as discussed above, has potential to give rise to adverse impacts to lowland river habitat, limited to the Bluebell Stream, as a result of the inadvertent release of pollutants and sediments within surface water run-off and the inappropriate discharge of foul water from the Project at operational phase.

As discussed above, white-clawed crayfish is known to be present within stretches of the River Liffey which lie approximately 3.2km downstream of the Project. It is considered that potential operational phase impacts to the freshwater environment, such as the inadvertent release of pollutants and contaminants would likely be largely subject to deposition within close proximity to the source. However, there is insufficient information available to conclude that such material would not give rise to measurable effects upon populations of this species which lie relatively close to and downstream of the Project. As the species is known to be sensitive to

the effects of sedimentation, it is considered that such potentially measurable effects could give rise to **minor adverse** and **significant** in the absence of mitigation.

5.4.2.3.3 Bats

The Project will, at operational phase, have limited potential to give rise to adverse impacts to bats with the exception of lighting impacts associated with the proposed design.

The EIAR is supported by a Lighting Assessment Report (see Volume III Technical Appendices) which is inclusive of proposed lighting fixture locations and associated lux plan, showing the resultant light levels which will be present on the site throughout the operational phase.

This lighting design has been sensitively designed to prevent excess lighting associated with the Project and as such proposed lighting levels to areas of retained and proposed vegetation will largely be less than 0.1lux. The site in general will be subject to low levels of artificial lighting.

The site is currently subject to existing artificial lighting associated with the adjacent M7 Business Park and the Osberstown Business Park to the south and north of the site respectively.

It is considered that areas of retained and proposed vegetation, including hedgerows, woodland and scrub planting and SuDS features which will provide opportunities for foraging and commuting bats at the operational phase of the proposals, will not be subject to adverse effects associated with artificial lighting. Furthermore, proposed bat boxes and houses will also not be subject to any adverse effects associated with operational phase lighting.

Impacts upon bats at operational phase are therefore considered to be **negligible** and **not significant**.

5.4.3 Cumulative Effects

5.4.3.1 Other Projects

As identified in Chapter 1 of the EIAR (Section 1.4), there are a number of other projects which have been identified for consideration in terms of their potential for cumulative effects. A number of planning applications (permitted, submitted but undetermined and under construction) have been identified within the locale of the Project site. While a range of applications have been submitted or approved within proximity to the Project, namely within the Osberstown Business Park and M7 Business Park. It is not considered that such proposals, which will take place within areas of existing development would have potential to act cumulatively with the Project.

5.4.3.2 Gas Connection

As identified in Chapter 1 of the EIAR (Section 1.4.4), the Project will require a physical connection to the gas network to supply the on-site gas turbines. The GNI Infrastructure Upgrade Outline Report, identifying the specification and most likely route for the connection and a description of the works required to provide same, is included in Volume II, Appendix 1.2. The report provides sufficient detail and information to allow a robust cumulative impact assessment to be conducted.

The construction works for the for the gas pipeline will likely comprise of a 14m working corridor within areas of agricultural land, in addition to works within the verge of public roads and watercourse crossings at three watercourses and a large number of minor drainage ditches and field drains. The method of constructing this crossing (and other watercourses along the likely route) will typically consist of either open excavation (from smaller watercourses and ditches) or directional drilling / pipe jacking as appropriate.

This GNI connection application will be undertaken following its own environmental assessment procedure and as such will be subject to the same obligations as the Project in respect of the extent of mitigation measures and standard good practice at construction, with a minimal footprint.

On this basis it is considered that the proposed gas pipeline connection to the project will have no potential to give rise to any cumulative effects upon ecological receptors when considered alongside the Project.

Given the nature of the impacts upon biodiversity which are predicted to arise in association with the Project, in addition to the mitigation measures which are set out in Section 5.5 below, it is not envisaged that the Project would have potential to give rise to any further potential significant effects when considered cumulatively with the nearby assessed projects.

5.4.4 Inter-Relationships

The assessment in this chapter of the potential of the Project to give rise to impacts upon hydrologically linked designated sites is linked to the assessment set out in Chapter 7: Water and Hydrology of the EIAR. Mitigation measures in respect of such potential impacts are largely drawn from the recommendations set out in these chapters.

The proposed landscape planting proposals, as referenced below in respect of mitigation, are drawn from Chapter 11 Landscape and Visual of the EIAR.

5.5 Mitigation

5.5.1 Designated Sites and Features of Natural Heritage Importance

The Project is considered to have negligible potential to give rise to significant effects upon designated sites of conservation significance. As such no specific mitigation measures are proposed in respect of designated sites.

Mitigation measures set out below in respect of freshwater aquatic habitats will also act to prevent any effects upon downstream European sites which are nonetheless deemed to be below a *de minimis* threshold.

5.5.2 Habitats

The Project will incorporate measures, as set out within the accompanying Landscape Statement and associated plans (see Volume III Technical Appendices) for the protection of retained habitats in addition to the delivery of proposed compensatory planting.

Proposed SuDS features, which will comprise a significant area of the Project site, will be subject to a range of wetland planting, including wet grasslands, marginals and aquatic species which are designed to provide a mosaic of habitats which are either temporarily or permanently wet and will provide significant floral diversity including a range of species of high value for pollinators.

Of the areas proposed for SuDS planting, including dry grassland swales and the margins of wetland ponds, a total of 2.6ha of species rich wet grasslands and wetland planting are proposed within the development. It is considered that this wet grassland planting will fully compensate for losses to areas of wet grassland and tall sedge swamps which will occur at construction phase of the Project as these existing habitats are relatively species poor. In addition, the proposals will also incorporate 1.38ha of biofiltration planting, comprised of a range of non-native species which nonetheless provide some opportunities for pollinators and other native invertebrates.

Proposed SuDS features themselves, which will support variable depths of open water, depending on weather conditions, will provide pond habitat which is not currently present on site and offer potential opportunities for a wide range of aquatic fauna including a wide range of invertebrates, in addition to associated benefits for foraging birds and bats. These features, which are likely to hold some water year-round will fully mitigate for any adverse effects associated with the loss of seasonally dry drainage ditches within the site and represent a significant ecological enhancement of the site post-development.

The Project, as set out above, will give rise to the loss of around 2.9km of hedgerows and treelines in addition to 0.22ha of orchard, comprised of a former kitchen garden, and 0.46ha of scrub largely dominated by bramble. In order to compensate for these losses, the Project is to incorporate large areas of woodland, scrub and hedgerow planting. In total 5.4ha of woodland planting is to be delivered within the Project, described as native mixed structural screen planting and comprised of a range of native species including a proportion of standard trees. A further 0.9ha of native scrub/hedge mix is also proposed for areas where full height woodland is not appropriate, such as in proximity to overhead lines, and will be managed to a maximum of 3m in height. This planting is to be located around the margins of the site, to provide screening of the development from adjacent areas and also providing continuous habitat corridors linking SuDS features and other proposed landscape planting with semi-natural habitats off-site to the south-west.

In addition to woodland and scrub planting the proposals will incorporate 0.639km of native hedgerows planted throughout the site and managed to a maximum height of 3m.

It is considered that proposed woodland, scrub and hedgerow planting will fully mitigate for proposed losses to hedgerows, scrub and orchard habitats within the site over the long term. Some residual short term adverse

effects (minor adverse) are nonetheless predicted associated with the loss of mature hedgerows and treelines and the associated delay in the establishment of compensatory habitats.

The Project will also incorporate significant areas of species-rich grassland planting including 3.1ha of short-cut floral lawns, comprising a range of native species tolerant to regular mowing to a relatively short height, and 3.4ha of long wildflower meadows which are to be managed through an annual hay cut regime. These habitats will be inclusive of a range of native flora species of value for invertebrates and will, it is considered, fully mitigate for losses of semi-improved neutral agricultural grasslands and dry meadows/grassy verges habitat which will arise as a result of the Project. Furthermore, it is considered that these areas of species-rich meadow will represent a significant enhancement of the site over the current situation.

In addition to proposed native planting a proportion of the proposed buildings will incorporate a total of 0.9ha of green roofs which are to be planted with a non-native sedum blanket and subsequently managed to ensure this habitat is maintained. These areas will provide some opportunities for a range of pollinator species.

Subject to the implementation of this compensatory planting it is envisaged that adverse ecological impacts associated with the loss of various habitats on site required to facilitate the Project, will be largely mitigated. Furthermore, the Project is predicted to deliver biodiversity net gain over the current situation through the provision of a range of species-rich habitats of value for pollinators in addition to wetland habitats, woodland and scrub.

Indirect effects associated with construction phase of the Project were limited to those associated with water quality and habitat deterioration effects arising to lowland river habitat (the Bluebell Stream) through sedimentation and pollution effects associated with nearby earthworks and other construction activities.

In order to mitigate these potential effects upon the freshwater environment a range of mitigation measures are to be implemented within the Project, and are set out within Chapter 7: Water and Hydrology of the EIAR and within the accompanying Construction and Environmental Management Plan (CEMP). Subject to the implementation of these construction phase mitigation measures it is considered that any potential significant adverse effects upon freshwater habitats within the Bluebell Stream, and any downstream watercourses, would be fully mitigated.

In addition to the above construction phase mitigation measures, the proposals will also incorporate a range of design measures to ensure that surface water run-off of the site is maintained consistent with the greenfield run-off rates including a range of SuDS features which will include petrol interceptors. Furthermore, proposals will incorporate the discharging of foul water to the existing Irish Water foul sewer for treatment at Osberstown WwTW. These features will ensure that any potential operational phase effects upon lowland river habitats (the Bluebell Stream) are fully mitigated.

While proposed mitigation measures will fully mitigate for impacts which are predicted to arise to habitats, some residual **minor adverse** and **significant** effects remain in relation to the loss of mature hedgerows and treelines within the site. While proposed compensatory planting will fully mitigate for such losses in the long term, residual short-term adverse effects are associated with the time required for establishment of compensatory planting following loss of mature hedgerow and treeline habitats.

5.5.3 Bats

Demolition of any building with a known bat roost must take place between March - mid- May or September - October inclusive, of any given year, to avoid the bat maternity and hibernation seasons and minimise the impact on bats. A NPWS bat roost derogation/roost exclusion licence will be obtained prior to the commencement of demolition of Structure 1, see accompanying Ecological Survey for Bats (Appendix 5.2, Volume II).

Prior to the demolition of the confirmed bat roost, Structure 1 (S1), and the other structures on site which have roosting suitability (S2-S6), the licenced ecologist will thoroughly search for the presence of roosting bats using an endoscope and torch. If bats are found to be present during demolition, species rescue and translocation will be carried out using gloves, and the bat(s) carefully transported to a nearby artificial bat roost. If a bat(s) is found roosting where it cannot be safely removed by hand, or where there are features with potential to conceal a roosting bat which cannot be sufficiently searched to confidently confirm that roosting bats are absent from the cavity, a bespoke designed bat exclusion device will be fitted around the roost entrance. Details of such measures will be included in the NPWS bat roost derogation licence method statement, as required.

All trees which have been confirmed to have Moderate or High bat roosting suitability will either have a dawn re-entry survey carried out or be inspected using an endoscope by a licenced ecologist immediately prior to felling. If any bats are found and cannot be safely removed by hand, the same measures stated above for structures will be applied.

4no. bat roost box locations are proposed within the site. These will comprise pole-mounted bat boxes, with two individual bat boxes proposed per location. Poles will be set in concrete or alternatively driven to a depth of at least 1m. Boxes themselves will be manufactured by Greenwood Ecohabitats[1] or similar, and will be erected, two per pole and fastened to the pole with metal straps or banding at a height of 3.5m or higher. These boxes are intended to compensate for the loss of numerous trees with bat roost potential which were not recorded to support bat roosts and to provide additional roosting resources for the local bat population. Greenwood Eco-Habitat artificial bat roost boxes are constructed from Ecostyrocrete and have a high bat uptake rate. The following boxes will be utilised, two per pole:

- 'Half and Half bat box' consist of a two-crevice design, and the other half of the box has the Small Hollow design, providing roosting opportunities for a wide range of bat species, or similar (Four no. total)
- Two crevice bat boxes, or similar. (Four no. total)

In addition to proposed bat box locations the proposals will incorporate three bat house structures. It is proposed that one will be a blockwork structure with floor dimensions of three-by-three metres, with a pitched slate/slate tile roof with 1F felt underlay, bat-access slates and gaps in soffits and facia to facilitate access. The interior of this structure will include layers of spaced plywood or OSB between rafters to provide interior crevices ("squeeze boxes") which will ensure that the structure is suitable for a variety of bat species. A door into this structure will be provided to facilitate access for monitoring and maintenance, as required.

The remaining two bat house structures will utilise a timber design with floor dimensions of approximately 2.5 x 2.5m and significantly raised off the ground. Such structures will utilise interior "squeeze box" features in addition to appropriate access points, including for monitoring. Further details on the design of these structures will be provided in respect of the NPWS derogation license application for the scheme and/or in respect of any relevant planning conditions.

Typical designs for bat houses and bat boxes are illustrated in drawing number 22217-RKD-ZZ-ZZ-DR-A-1402 (Volume III).

An ECoW will provide advice on the exact design and location of artificial bat roosts however the initially proposed locations are shown on the project Landscape Masterplan (BSM-ZZ-ZZ-DR-L-0301) which accompanies the EIAR submission. Proposed artificial bat roost boxes and bat houses are to be located along the southern site boundary to utilise the connectivity of the bluebell stream to the River Liffey, in addition to providing close access to proposed mitigation planting and SUDs features for foraging.

The Lighting Strategy for the Project has been designed in accordance with the Institution of Lighting Professionals (ILP) Guidance Notes for the Reduction of Obtrusive Light (ILP 2011) and Bats and Artificial Lighting in the UK (ILP 2018).

Artificial lighting will only be installed where and when necessary, i.e. when it is needed for safety reasons or to comply with statutory guidelines. There will be no direct illumination of any artificial bat roosts. Lighting will be avoided in areas where existing trees are to be retained and in areas proposed for native woodland buffer planting. Lighting design will aim to use narrow spectrum lights with no UV content; directional downlights illuminating below the horizontal plane; bollard or low level downward directional luminaries; external security lighting should be set on motion-sensors and short (1 minute) timers; and use accessories such as baffles, shields, louvres or adjusting the angle of the lamp where necessary (ILP 2018).

Proposed bat box and house locations will be located within areas of the site which will not be subject to lighting levels greater than 0.1lux associated with the Project. Proposed mitigation planting will in the medium term, provide further attenuation of artificial lighting from off-site sources.

The Project will incorporate significant areas of compensatory planting including areas of woodland, scrub, species rich grassland, hedgerows and SUDs features which are likely to fully mitigate for the loss of foraging habitats currently supported on the site for bats. The site was not considered likely to act as a significant

[1] https://www.greenwoodsecohabitats.co.uk/shop

commuting route for local bat populations given its location between areas of existing development and the M7 road. Connectivity of the site and the wider area will be maintained through the proposed landscape planting regime.

It is considered that the provision of these measures will fully mitigate for the loss of roosts and potential roosts which will occur as a result of the Project. Furthermore these proposals will represent a significant enhancement of the site for roosting bats and will provide opportunities for maternity colonies and individual roosting bats which are not currently supported on the site.

5.5.4 Birds

The Project has potential to give rise to significant effects upon nesting bird's species which are likely to utilise habitats including scrub, orchard, scattered trees, hedgerows, amenity planting and buildings within the Project site.

In order to avoid any significant impacts upon birds all site clearance, in addition to demolition of buildings, will take place during the period 1st September to 28th February which is outside the breeding season for those bird species that are likely to breed on the site. This will avoid any direct impacts of the Project on breeding birds.

Proposed mitigation planting and SUDs features within the Project design are likely to provide significant opportunities for breeding birds during the operational phase of the Project.

5.6 Summary of Effects & Conclusion

The Project has potential to give rise to a range of significant impacts upon natural heritage and biodiversity receptors.

No significant adverse impacts are predicted to arise to any sites designated on account of natural heritage or conservation interests.

Predicted significant impacts upon habitats are limited to the loss of areas of habitat of local importance including wet grasslands, tall sedge swamps, orchard, hedgerows and treelines within the site and potential water quality and habitat deterioration effects arising through the accidental release of sediments or pollutants into the freshwater environment at construction or operation.

Potential impacts to protected species include impacts to downstream populations of white-clawed crayfish associated with the accidental release of sediments or pollutants into the freshwater environment at construction or operation; the loss of a single building recorded to support a bat roost, impacts to foraging and commuting bats associated with the loss of hedgerows, treelines and other habitats of value for this group; and disturbance to nesting birds.

A summary of the predicted effects and proposed mitigation is set out below at Table 5.4.

Residual effects on natural heritage and biodiversity as a result of the Project are limited to **minor adverse** and **significant** effects associated with the short-term loss of hedgerows and treelines which will occur prior to the establishment of compensatory woodland, scrub and hedgerow planting which will however fully mitigate for such losses in the long term. These effects upon habitats will give rise to associated **minor adverse** and **significant** effects upon foraging and commuting bats, again in the short term.

Table 5.4: Summary Table of Likely Environmental Effects on Natural Heritage and Biodiversity Pre and Post Mitigation

Sensitivity of receptor	Receptor	Description of Effect	Duration	Magnitude	Magnitude of Effect	Significant Not significant	Significant or Not significant Post Mitigation
International level	**Construction phase**	Water quality and habitat deterioration: release of sediments or pollutants into the freshwater environment.	Short term	Negligible	Negligible	Not significant	Not significant
Site level	Designated Sites of Natural Heritage Importance	Loss of habitat.	Short term	Negligible	Negligible	Not significant	Not significant
Site level	Habitats: Improved Grassland	Loss of habitat.	Short term	Negligible	Negligible	Not significant	Not significant
Site level	Habitats: Amenity Grassland	Loss of habitat.	Short term	Minor	Minor adverse	Significant	Not significant
Site level	Habitats: Dry Neutral Grassland	Loss of habitat.	Short term	Negligible	Negligible	Not significant	Not significant
Local level	Habitats: Dry Meadows/Grassy Verges	Loss of habitat.	Short term	Minor	Minor adverse	Significant	Not significant
Local level	Habitats: Wet Grassland	Loss of habitat.	Short term	Minor	Minor adverse	Significant	Not significant
Site level	Habitats: Large sedge swamps	Loss of habitat.	Short term	Negligible	Negligible	Not significant	Not significant
Local level	Habitats: Tilled land	Loss of habitat.	Short term	Minor	Minor adverse	Significant	Not significant
Site level	Habitats: Orchard	Loss of habitat.	Short term	Negligible	Negligible	Not significant	Not significant
Negligible	Habitats: Scrub	Loss of habitat.	Short term	Negligible	Negligible	Not significant	Not significant
Negligible	Habitats: Buildings	Loss of habitat.	Short term	Negligible	Negligible	Not significant	Not significant
Site level	Habitats: Hardstanding	Loss of habitat.	Short term	Negligible	Negligible	Not significant	Not significant

Local level	Habitats: Drainage ditches	Water quality and habitat deterioration effects.	Short term	Minor	Minor adverse	Significant	Not significant
Site level	Habitats: Lowland river	Loss of habitat.	Short term	Negligible	Negligible	Not significant	Not significant
County level	Habitats: Amenity planting	Loss of habitat.	Short term	Moderate	Moderate adverse	Significant	Significant
County level	Habitats: Hedgerows	Loss of habitat.	Short term	Moderate	Moderate adverse	Significant	Significant
Site level	Habitats: Treelines	Loss of habitat.	Short term	Negligible	Negligible	Not significant	Not significant
National level	Habitats: Scattered trees	Downstream water quality and habitat deterioration effects.	Short term	Minor	Minor adverse	Significant	Not significant
National level	White-clawed crayfish	Loss of roost.	Short term	Moderate	Moderate adverse	Significant	Not significant
National level	Bats	Temporary loss of foraging and commuting habitat.	Medium term	Minor	Minor adverse	Significant	Not Significant
Local level	Bats	Destruction of bird nests or disturbance to nesting birds.	Short term	Moderate	Moderate adverse	Significant	Not significant
International level	Birds	Water quality and habitat deterioration: release of sediments or pollutants into the freshwater environment.	Short term	Negligible	Negligible	Not significant	Not significant
Local level	**Operational phase**	Water quality and habitat deterioration effects.	Short term	Minor	Minor adverse	Significant	Not significant
National level	Designated Sites of Natural Heritage Importance	Downstream water quality and habitat deterioration effects.	Short term	Minor	Minor adverse	Significant	Not significant

	Habitats: Lowland river						
	White-clawed crayfish						

5.7 Limitations of the Assessment

The above EcIA has been undertaken on the basis of findings reached through a range of surveys undertaken in line with relevant industry guidelines. It is not considered that there were any particular limitations to the assessment which took account of the findings of these surveys, which are likely to have significantly affected the outcome of the assessment.

5.8 References

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