Ecological Impact Statement for development at Thomas Street, Limerick City

Compiled by OPENFIELD Ecological Services

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for Limerick City and County Council

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1 INTRODUCTION

This Ecological Impact Statement has been prepared by Pádraic Fogarty of OPENFIELD Ecological Services. Pádraic has worked for 25 years in the environmental field and in 2007 was awarded an MSc from Sligo Institute of Technology for research into Ecological Impact Assessment (EcIA) in Ireland. OPENFIELD is a full member of the Institute of Environmental Management and Assessment (IEMA).

Under Article 6(3) of the Habitats Directive an 'appropriate assessment' of projects must be carried out to determine if significant effects are likely to arise to Natura 2000 sites. An Appropriate Assessment Screening Report has been prepared as a separate stand alone report.

2 STUDY METHODOLOGY

The assessment was carried out in accordance with the following best practice methodology: 'Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland' by the Institute of Ecology and Environmental Management (IEEM, 2018).

A site visit was carried out on the 15th of January 2021 in fair weather. The site was surveyed in accordance with the Heritage Council's Best Practice Guidance for Habitat Survey and Mapping (Smith et al., 2010). Habitats were identified in accordance with Fossitt's Guide to Habitats in Ireland (Fossitt, 2000).

The nomenclature for vascular plants is taken from *The New Flora of the British Isles* (Stace, 2010) and for mosses and liverworts *A Checklist and Census Catalogue of British and Irish Bryophytes* (Hill et al., 2009).

January lies outside the optimal period for general habitat surveys (Smith et al., 2010) however, due to the entirely built-up/artificial nature of the habitats present, it was possible to classify all habitats on the site to Fossitt level 3. January lies outside the optimal season for surveying breeding birds and mammals.

Because of the highly artificial nature of the habitats on this development site, the timing of the survey was not a constraint to a full ecological assessment. All habitats were identified to the appropriate level.

A dedicated bat survey was carried out by Malachy Walshe and Partners in May 2021, within the optimal flight period. The findings of this study are incorporated into this EcIA.

3 EXISTING RECEIVING ENVIRONMENT

3.1 Zone of Influence

Best practice guidance suggests that an initial zone of influence be set at a radius of 2km for non-linear projects (IEA, 1995). However some impacts are not limited to this distance and so sensitive receptors further from the project footprint may need to be considered as this assessment progresses. This is shown in figure 1.

Figure 1 – Site location (red cross) showing nearby areas designated for nature conservation. The boundary of the Lower River Shannon SAC is shown in tan. The SPA and pNHA fall within the boundary of the SAC (from www.epa.ie).

There are a number of designations for nature conservation in Ireland including National Park, National Nature Reserve, RAMSAR site, UNESCO Biosphere reserves, Special Protection Areas (SPA – Birds Directive), Special Areas of Conservation (SAC – Habitats Directive); and Natural Heritage Areas. The mechanism for these designations is through national or international legislation. Proposed NHAs

(pNHA) are areas that have yet to gain full legislative protection. They are generally protected through the relevant County Development Plan. There is no system in Ireland for the designation of sites at a local, or county level. The following areas are located within an approximate 2km radius of the development site:

The site is in the catchment of the River Shannon, which falls within the **Lower River Shannon SAC (site code: 2165).** At its closest point the boundary of the SAC is approximately 480m from the development site. This is a very large SAC that stretches from Killaloe to Loop head/Kerry head and is over 720 km^2 in area. The reasons why this area falls under the SAC designation are set out in its qualifying interests. They are either habitat types listed in Annex I or species listed in Annex II of the Habitats Directive. This information is provided by the National Parks and Wildlife Service (NPWS) and is shown in table 1 below along with the status of the feature at a national level (NPWS, 2019). This status refers to the most recent reporting period to the European Commission under Article 17 of the Habitats Directive.

Table 1 – Qualifying interests for the Lower River Shannon SAC (from NPWS)

Code	Habitats	Status
1130	Estuaries	Inadequate
1140	Mudflats and sandflats not covered by seawater at low tide	Inadequate
1150	Coastal lagoons	Bad
1230	Vegetated sea cliffs of the Atlantic and Baltic coasts	Inadequate
1310	Salicornia and other annuals colonizing mud and sand	Favourable
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	Inadequate
1410	Mediterranean salt meadows (Juncetalia maritimi)	Inadequate
3260	Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation	Inadequate
1110	Sandbanks which are slightly covered by sea water all the time	Favourable
1160	Large shallow inlets and bays	Bad
1170	Reefs	Inadequate
1220	Perennial vegetation of stony banks	Inadequate
6410	Molinia meadows on calcareous, peaty or claey-silt-laden soils (Molinion caeruleae)	Bad
91E0	Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)	Bad
1099	*Lampetra fluviatilis* River lamprey	Not assessed
1096	*Lampetra planeri* Brook lamprey	Favourable
1095	*Petromyzon marinus* Sea lamprey	Bad
1106	*Salmo salar* Atlantic salmon	Inadequate
1349	*Tursiops truncatus* Bottle-nosed dolphin	Favourable

1355	*Lutra lutra* Otter	Favourable
1029	*Margaritifera margaritifera* Freshwater pearl mussel	Bad

The **River Shannon and River Fergus Estuaries SPA** (site code: 4077) overlaps with the Lower River Shannon SAC and stretches from the Shannon Bridge west of the city centre to the mouth of the Shannon west of Kilrush. This SPA encompasses the largest expanse of intertidal mudflats in Ireland. SPAs are designated for their internationally important species (listed on Annex I of the Birds Directive) or population sizes (>1% of the global population or >20,000 individuals). Most recent available data indicate that a mean of 10,235 birds utilised the area during the winters from 2006-11 (Crowe et al., 2012). This includes internationally important numbers of Mute swan *Cygnus olor* and Whooper swan *C. cygnus* and nationally important numbers of Shelduck *Tadorna tadorna,* Wigeon *Anas penelope,* Teal *A. crecca,* Cormorant *Phalacrocorax carbo,* Dunlin *Charadrius alpina,* Black-tailed godwit *Limosa limosa* and Curlew *Numenius arquata.* The SPA's features of interest (analogous to qualifying interests for SACs) are given in Table 2. The status given is from a national assessment and does not infer status within the SPA itself.

Table 2 – Qualifying interests for the River Shannon and River Fergus Estuaries SPA (from NPWS)

Species		**Status**[1]
Light-bellied Brent Goose	*Branta bernicla hrota*	Amber (Wintering)
Pintail	*Anas acuta*	Red (Wintering)
Scaup	*Aythya marila*	Red (Wintering)
Shoveler	*Anas clypeata*	Red (Wintering)
Ringed Plover	*Charadrius hiaticula*	Amber
Golden plover	*Pluvialis apricaria*	Red (Breeding & Wintering)
Grey Plover	*Pluvialis squatarola*	Red (Wintering)
Lapwing	*Vanellus vanellus*	Red (Breeding & Wintering)
Knot	*Calidris canutus*	Red (Wintering)
Dunlin	*Calidris alpina*	Red
Bar-tailed Godwit	*Limosa lapponica*	Red (Wintering)
Black-tailed Godwit	*Limosa limosa*	Red (Wintering)
Redshank	*Tringa totanus*	Red
Greenshank	*T. nebularia*	Green
Black-headed Gull	*Croicocephalus ridibundus*	Amber
Whooper Swan	*Cygnus cygnus*	Amber
Shelduck	*Tadorna tadorna*	Amber
Wigeon	*Anas penelope*	Amber
Teal	*Anas crecca*	Amber
Cormorant	*Phalacrocorax carbo*	Amber

[1] Gilbert et al., 2021. *Birds of Conservation Concern in Ireland 2020-2026*

Curlew	*Numenius arquata*	Red
Wetlands & Waterbirds		

It should be noted that a separate Screening Report for Appropriate Assessment has been prepared, as required under EU and national legislation. This has concluded that significant effects to Natura 2000 sites are not likely to arise as a result of this project.

Inner Shannon Estuary – South Shore pNHA (site code: 435) lies entirely within the Lower River Shannon SAC. The following information is available on this pNHA from the NPWS: "The River Shannon Estuary sweeps inland from Foynes, Co. Limerick, as far as Limerick City. This is a large tidal system with intertidal mudflats, fringing reedbeds, swamps, polders, salt marsh and wet marsh habitats. Reedbeds and their associated swamp habitats generally mark the edges of the various rivers and stream channels and sheltered creeks within the system. The common reed (Phragmites australis) dominates with clubrushes (Scirpus spp.) and bulrushes (Typha spp.) more locally abundant. Brackish estuarine marsh and salt marsh habitats make up a considerable portion of the fringing vegetation. The extensive mudflats of the Shannon Estuary abound with invertebrate food, which supports many thousands of wading birds and duck. Greenland White-fronted and Greylag Geese frequent the southern shores of the estuary during the winter months.

This site along with sections in Co's. Kerry and Clare and the associated Fergus Estuary are amongst the most important sites in Europe for wintering and migrating waterfowl. The vast sweep of mudflats provides a rich source of nutrition for thousands of wildfowl. On a national scale it is perhaps more important for waders than for wildfowl. Regular counts have established its international importance. The spread of cord grass (Spartina sp.) requires investigation as its presence over large areas reduces the available feeding ground and reduces the attractiveness to waterfowl. The mudflats would be susceptible to various forms of toxic water pollution and close monitoring is required of any present or planned industrial development in the area. The presence of two rare plant species along the estuary greatly increases the scientific value of the site. The estuary is a stronghold for both the rare triangular rush (Scirpus triqueter) and summer snowflake (Leucojuin pestirum): both are found locally abundant along the system." 11th July 1995.

The web site of the National Parks and Wildlife Service contains a mapping tool that indicates known records of legally protected species within a selected Ordnance Survey (OS) 10km grid square. The Thomas St. site is located within the square R55 and five species of protected plant are highlighted[2]. These are detailed in Table 3. This list is indicative only and is not intended to be either comprehensive or up-to-date.

[2] Listed on the Flora Protection Order. SI No. 356 of 2015.

Table 3 – Records of protected species from the R55 square

Species	Habitat (Parnell et al., 2012)	Record status (Preston et al., 2002)
Colchicum autumnale Autumn crocus	Meadows and river banks	pre-1970
Groenlandia densa Opposite-leaved pondweed	Ditches, streams and canals [aquatic]	Current
Hordeum secalinum Meadow barley	Damp places, chiefly near the sea	Current
Mentha pulegium Penny royal	Damp sandy places	pre-1970
Scirpus triqueter Triangular club rush	Tidal mud	Current

As can be seen there are current records for three of the five species. The *Flora of County Limerick* provides further detail on the status of these species (Reynolds, 2013).

- Opposite-leaved Pondweed is described as “locally abundant around Limerick city” including “the Limerick canal, tidal rivers and on tidal mud by the upper Shannon Estuary.”
- Meadow Barley - “Locally common along and near the Shannon Estuary, and by creeks and a river off the estuary”
- Triangular Club-rush - “fairly common by and near the Shannon Estuary. On tidal mud by the upper Shannon Estuary, often forming dense stands”

Water quality in rivers is monitored on an on-going basis by the Environmental Protection Agency (EPA). The Thomas St. site is not directly adjacent any water course but is close to the banks of the River Shannon. It is approximately 480m from the river at its closest point. The River Shannon at this point is tidally influenced and is characterised by artificial quay walls. This transitional water body, which stretches from Corbally Road in the north-east to west of the N18 road, is assessed under the Water Framework Directive (WFD) as ‘good’ status. West of this, the Upper Shannon Estuary as far as Shannon Town in Co. Clare, is ‘poor’ status. These data are taken from the ENVision mapping tool on www.epa.ie.

3.2 Site Survey

Aerial photography and historic mapping from the Ordnance Survey Ireland (OSI) shows that the Thomas St. area has been part of the urban fabric of Limerick City for many centuries. The lands in the immediate vicinity are heavily urbanised with extensive areas of buildings and hard surfacing.

3.4.1 Flora

The development site is entirely composed of **buildings and artificial surfaces – BL3** with no trees or areas of open green space. Vegetation is minimal and confined to ruderal species such as Brambles *Rubus fruticosus agg.,* Himalayan Honeysuckle *Leycesteria formosa* and Hart's-tongue *Asplenium scolopendrium.*

There are no water courses or drainage ditches on these lands. There are no species which are listed as alien invasive under Schedule 3 of SI No. 477 of 2011.

3.4.2 Fauna

The site survey included incidental sightings or proxy signs (prints, scats etc.) of faunal activity, while the presence of certain species can be concluded where there is suitable habitat within the known range of that species. Table 4 details those mammals that are protected under national or international legislation in Ireland. Cells are greyed out where records from the National Biodiversity Data Centre (NBDC) do not exist.

No direct evidence for any mammal was recorded during the site survey. The development site was assessed for its potential to provide roosting habitat for bats. While the building provides suitable space for roosting bats, the location is assessed as having low roost potential due to the lack of trees and other green space in the immediate vicinity (Hundt, 2013). A dedicated bat survey is planned for the optimal flight period in 2021.

A dedicated bat survey was carried out in May 2021. It found that "No direct or indirect evidence of any usage by bats was recorded in [the] building and [it does not have] the characteristics required by roosting bats."

There are no wetlands or rivers suitable for Otter. There is no suitable habitat for Badger or small mammals which are protected in the Wildlife Act, i.e. Irish Stoat, Pygmy Shrew and Hedgehog (Lysaght & Marnell, 2016).

January is outside the suitable season for surveying breeding birds. Buildings may provide habitat for nesting Feral Pigeon *Columba livia.* This bird is of low conservation concern (Colhoun & Cummins, 2013). Suitable habitat for nesting song birds is minimal due to the lack of vegetation.

There are no habitats suitable for fish on the subject site. Drainage pathways lead to the Shannon and this is of fisheries value with Atlantic Salmon *Salmo salar,* Brown Trout *S. trutta,* European Eel *Anguilla*

anguilla and Lamprey *Lampetra sp*[3]. However the dam at Ardnacrusha presents a significant barrier to the movement of migratory fish.

There are no habitats on site suitable for spawning amphibians. Most habitats, even highly altered ones, are likely to harbour a wide diversity of invertebrates. In Ireland only one insect is protected by law, the Marsh Fritillary butterfly *Euphydryas aurinia,* and this is not to be found in this vicinity. Other protected invertebrates, such as the Freshwater Pearl Mussel, are not found downstream of the Thomas St. site.

Figure 2 – Site boundary

[3] www.wfdfish.ie

Table 4 – Protected mammals in Ireland and their known status within the R66 2km square[4]. Those that are greyed out indicate either that that there are no records of the species from the National Biodiversity Date Centre.

Species	Level of Protection	Habitat
Otter *Lutra lutra*	Annex II & IV Habitats Directive; Wildlife (Amendment) Act, 2000	Rivers and wetlands
Lesser horseshoe bat *Rhinolophus hipposideros*	Annex II & IV Habitats Directive; Wildlife (Amendment) Act, 2000	Disused, undisturbed old buildings, caves and mines, west of Ireland only
Whiskered bat *Myotis mystacinus*	Annex IV Habitats Directive; Wildlife (Amendment) Act, 2000	Gardens, parks and riparian habitats
Natterer's bat *Myotis nattereri*		Woodland
Brown long-eared bat *Plecotus auritus*		Woodland
Leisler's bat *Nyctalus leisleri*		Woodlands and buildings
Common pipistrelle *Pipistrellus pipistrellus*		Farmland, woodland and urban areas
Soprano pipistrelle *Pipistrellus pygmaeus*		Rivers, lakes & riparian woodland
Daubenton's bat *Myotis daubentonii*		Woodlands and bridges associated with open water
Nathusius' pipistrelle *Pipistrellus nathusii*		Parkland, mixed and pine forests, riparian habitats
Irish hare *Lepus timidus hibernicus*	Annex V Habitats Directive; Wildlife (Amendment) Act, 2000	Wide range of habitats
Pine Marten *Martes martes*		Broad-leaved and coniferous forest
Hedgehog *Erinaceus europaeus*	Wildlife (Amendment) Act, 2000	Woodlands and hedgerows
Pygmy shrew *Sorex minutus*		Woodlands, heathland, and wetlands
Red squirrel *Sciurus vulgaris*		Woodlands
Irish stoat *Mustela erminea hibernica*		Wide range of habitats
Badger *Meles meles*		Farmland, woodland and urban areas

[4] From the National Biodiversity Data Centre, excludes marine cetaceans

Red deer *Cervus elaphus*		Woodland and open moorland
Fallow deer *Dama dama*		Mixed woodland but feeding in open habitat
Sika deer *Cervus nippon*		Coniferous woodland and adjacent heaths

3.5 Overall Evaluation of the Context, Character, Significance and Sensitivity of the Proposed Development Site

In summary it has been seen that the development site is of very low biodiversity value buildings and artificial surfaces. There are no examples of habitats listed on Annex I of the Habitats Directive or records of rare or protected plants. There are no species listed as alien invasive as per SI 477 of 2011 or as 'most unwanted' by Invasive Species Ireland.

Significance criteria are available from guidance published by the National Roads Authority (NRA, 2009). These are reproduced in table 5. From this an evaluation of the various habitats and ecological features on the site has been made and this is shown in table 6.

Table 5 Site evaluation scheme taken from NRA guidance 2009

Site Rating	***Qualifying criteria***
A - International importance	SAC, SPA or site qualifying as such. Sites containing 'best examples' of Annex I priority habitats (Habitats Directive). Resident or regularly occurring populations of species listed under Annex II (Habitats Directive); Annex I (Birds Directive); the Bonn or Berne Conventions. RAMSAR site; UNESCO biosphere reserve; Designated Salmonid water
B - National importance	NHA. Statutory Nature Reserves. Refuge for Flora and Fauna. National Park. Resident or regularly occurring populations of species listed in the Wildlife Act or Red Data List 'Viable' examples of habitats listed in Annex I of the Habitats Directive
C - County importance	Area of Special Amenity, Tree Protection Orders, high amenity (designated under a County Development Plan) Resident or regularly occurring populations (important at a county level, defined as >1% of the county population) of European, Wildlife Act or Red Data Book species Sites containing semi-natural habitat types with high biodiversity in a county context, and a high degree of naturalness, or populations of species that are uncommon in the county

D - Local importance, higher value	Sites containing semi-natural habitat types with high biodiversity in a county 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.
E - Local importance, lower value	Sites containing small areas of semi-natural habitat that are of some local importance for wildlife; Sites or features containing non-native species that are of some importance in maintaining habitat links.

Table 6 Evaluation of the importance of habitats and species on the Thomas St. site

Buildings and artificial surfaces – BL3	Negligible ecological value

4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed Development consists of a change of use from single house to apartments and remodeling of the existing four-storey-over-basement Georgian terraced house at No. 33 Thomas Street to provide 5no. one-bedroom apartments.

The material alterations, repairs and renewals proposed to No.33 Thomas Street comprise: demolition of the return to the rear; reinstatement of the front lightwell and railings; removal and alterations to existing internal partitions, doors and joinery: fire upgrading of existing walls and ceilings, installation of mechanical and electrical services, as well as sundry remedial works not impacting on the character or special interest Georgian original (not a Protected Structure).

The proposed Development also consists of demolition of the former fire station structure at No. 34 Thomas Street to provide two ranges of residential apartments around an internal courtyard – one facing onto Thomas Street and the other along the rear boundary of the site. Connected by a staircase and passenger lift structure, the proposed new apartment structure is five-storeys tall, comprising retail / commercial, community and storage uses at ground floor level, with apartments at first, second, third and fourth floor levels. The top floor onto Thomas Street is set-back from the street façade to the line of the ridge of No. 33. The proposed apartments comprise 8no. two-bedroom units.

The proposed development includes the creation of a semi-private courtyard between the Thomas Street and the rear block– to provide residential amenity space, as well as bicycle and bin-storage, for the residential apartments.

Services and siteworks proposed to facilitate the proposed development include: new water, electricity and comms supplies; new foul sewage and storm water connections to public mains; air-to-water and roof-mounted PV panels for heating and ventilation.

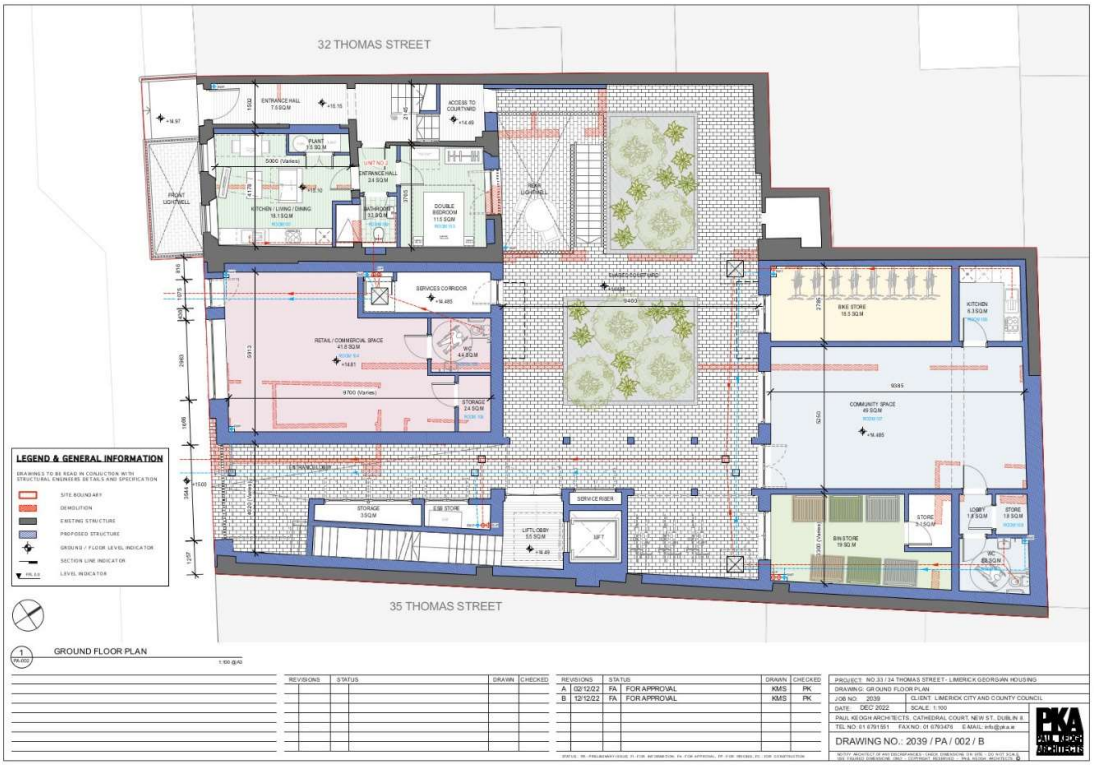

Figure 3 – Site layout

5 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

This section provides a description of the potential impacts that the proposed development may have on biodiversity in the absence of mitigation. Methodology for determining the significance of an impact has been published by the NRA. This is based on the valuation of the ecological feature in question (table 6) and the scale of the predicted impact. In this way it is possible to assign an impact significance in a transparent and objective way. Table 7 summaries the nature of the predicted impacts.

5.1 Construction Phase

The following potential impacts are likely to occur during the construction phase in the absence of mitigation:

1. Habitat loss

The removal of habitats. These are entirely artificial in nature and not associated with any species of conservation interest. The landscaping proposal, as shown in figure 4, will include planting which will enhance the level of vegetation compared to the existing baseline. This will result in a moderate positive impact to biodiversity on this development site.

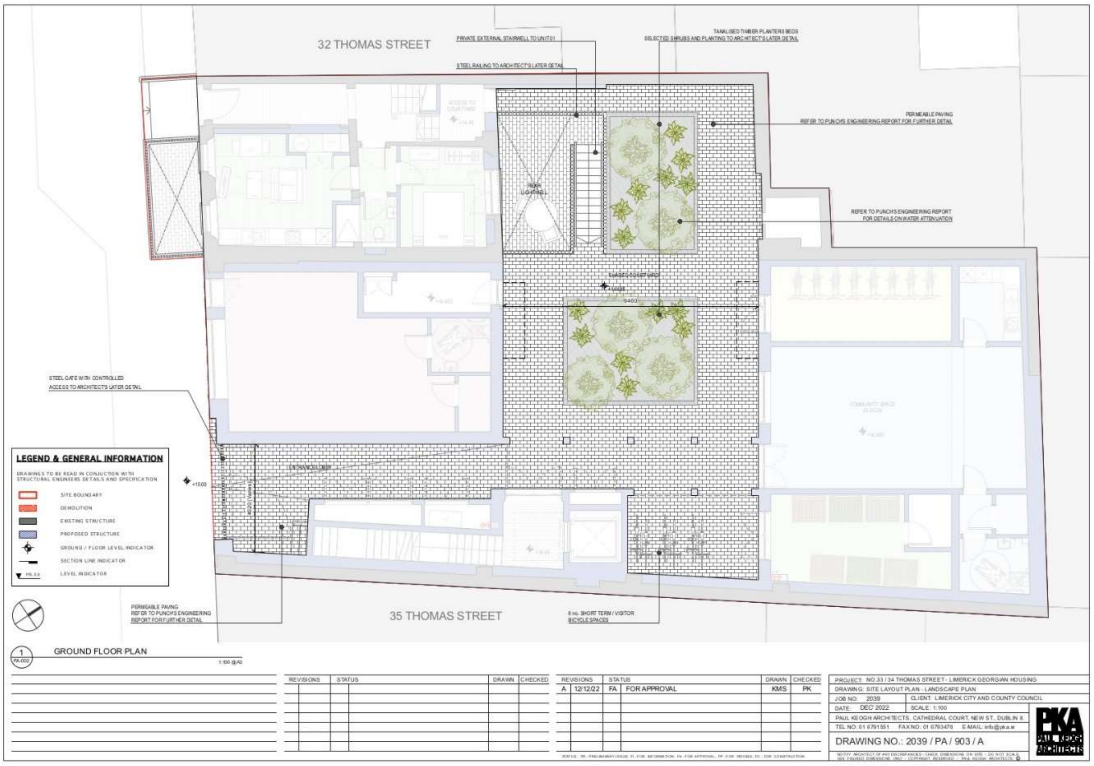

Figure 4- landscaping

2. The direct mortality of species during demolition. This impact is most acute during the bird breeding season which can be assumed to last from March to August inclusive. The buildings and artificial surfaces have low suitability for nesting birds or roosting bats, nevertheless, these features are protected by law and so any mortality would result in a moderate negative impact. Following a dedicated bat survey of the development site, not bat roosting was recorded.

3. Pollution of water courses through the ingress of silt, oils and other toxic substances. The distance from the River Shannon means that there is a buffer between potential pollution sources and this sensitive receptor. There is no pathway to the freshwater portion of the River Shannon from this location. The tidal portion of the river is not vulnerable to the input of sediment in the way that upstream spawning habitats are and so impacts from this source will not occur.

Furthermore, there is no pathway for pollutants to reach the River Shannon. There is no significant source of sediment in this location as the development site is already of hard surfacing. The risk of pollution to water courses is therefore considered to be negligible.

Operation Phase

The following potential impacts are likely to occur during the operation phase in the absence of mitigation:

4. Pollution of water from foul wastewater arising from the development.

The proposed development will result in an increase in the volume of wastewater discharge to the sewerage system. Foul sewerage from Limerick City leads to the Bunlicky treatment plant in Limerick City which, in turn, discharges treated wastewater to the River Shannon Estuary.

The municipal wastewater treatment plant at Bunlicky is operated by Irish Water and is licenced by the EPA (register no.: D0013-01) to discharge treated effluent to the Shannon. The Annual Environmental Report from the plant for 2019 indicated that there was a single exceedence of licence limits for that year. This related to a sample of ortho-phosphate the cause of which was identified as "under dosing of ferric and not responding to an increase of phosphate in influent flow".

The AER states "the discharge from the wastewater treatment plant does not have an observable impact on the water quality" and that "the discharge from the wastewater treatment plant does not have an observable negative impact on the Water Framework Directive status. The plant has a design capacity of 130,000 population equivalent (P.E.) and hydraulic loading was lower than this. The report indicates that the plant is not likely to exceed its capacity within the next three years. There can be no negative effect to biodiversity from this source.

5. Pollution of water from surface water run-off.

The proposed development will see no changes to the area of hard surfaces so there can be no negative effect to the pattern of surface water run-off over and above the existing situation. Surface water draining from the development site currently drains to a combined sewer.

6. No impacts are predicted to occur to the status of the Lower River Shannon SAC or any other Natura 2000 area. A full assessment of potential effects to these areas is contained within a separate Screening Report for Appropriate Assessment. There can be no effect to any area designated for nature conservation.

Table 7: Significance level of likely impacts in the absence of mitigation

Impact		Significance
Construction phase		
1	Habitat loss	Neutral – no effects

2	Mortality to animals during construction	Moderate negative – permanent impacts to species of high local value/or species with legal protection
3	Pollution of water during construction phase	Neutral – no effects
4	Wastewater pollution	Neutral – no effects
5	Surface water pollution	Neutral – no effects
6	Impacts to protected areas	Neutral – no effects

Overall it can be seen that one potential moderate negative impact is predicted to occur as a result of this project in the absence of mitigation.

5.2 Cumulative impacts

A number of the identified impacts can also act cumulatively with other impacts from similar developments in this area of Limerick. These may arise through the additional loading to the Bunlicky Wastewater Treatment Plant, loss of semi-natural habitat, or conversion of open green space to hard surfacing thereby affecting patters of surface water flow. This project will not result in any loss of semi-natural habitat and will not affect the level of existing hard surfacing. Additional loading to the Bunlicky plant cannot result in negative effects to biodiversity as ample capacity exists to maintain treatment levels to the requirements of the Urban Wastewater Treatment Directive.

6 AVOIDANCE, REMEDIAL AND MITIGATION MEASURES

This report has identified one impact that was assessed as 'moderate negative' and therefore mitigation is needed to reduce the severity of this potential effect. This may arise where works occur to the building during the bird nesting season, which lasts from March to August inclusive. All birds' nests, eggs or hatchlings are protected under the Wildlife Act. Disturbance to any nest can only be done under licence from the National Parks and Wildlife Service (NPWS).

6.1 Mitigation Measures Proposed

The following mitigation measures are proposed for the development

Construction Phase

Mitigation 1: Disturbance of birds' nests

All birds' nests, eggs and young are protected by law. External works to buildings should be carried out outside the nesting season (September to February). Where this is not possible, the building should be first inspected for nests. If no nest is present demolition can proceed. If a nest is present then works can only proceed under licence from the National Parks and Wildlife Service.

7 PREDICTED IMPACTS OF THE PROPOSED DEVELOPMENT

This section allows for a qualitative description of the resultant positive and negative effects which the proposed development may have, assuming all mitigation measures are fully and successfully applied.

With the implementation of all mitigation measures there will be no negative effects to biodiversity which are moderate or greater in magnitude.

8 MONITORING

Monitoring is required where the success of mitigation measures is uncertain or where residual impacts may in themselves be significant. No significant effects are likely to arise as a result of this development to biodiversity so monitoring is not required.

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APPENDIX 1 SPECIES LIST

The nomenclature for vascular plants is taken from the *New Flora of the British Isles* (Stace, 2010).

Scientific names for mosses comes from *A Checklist and Census Catalogue of British and Irish Bryophytes* (Hill et al., 2008) while common names are taken from *Mossess and Liverworts of Britain and Ireland* (Atherton et al. eds., 2010).

Species indicated with an asterisk '*' are known to have been introduced to Ireland by humans.

Improved agricultural grassland - GA1		**DAFOR**
Dactylis glomerata	Cock's-foot	F
Grasses		D
Juncus SP.	Rushes	O
Plantago lanceolata	Ribwort Plantain	O
Taraxacum sp.	Dandelions	O
Urtica dioica	Common Nettle	O

Hedgerow - WL1		**DAFOR**
*Acer pseudoplatanus**	Sycamore	O
Alnus glutinosa	Alder	O
Betula sp.	Birch	O
Centaurea nigra	Common Knapweed	R
Cornus sanguinea	Dogwood	F
Corylus avellana	Hazel	R
Crataegus monogyna	Hawthorn	O
*Fagus sylvatica**	Beech	O
Galium aparine	Cleavers	O
Hedera helix	Common Ivy	F
Narcissus sp.	Daffodils	F
Pinus sylvestris	Scots Pine	R
Quercus sp.	Oak	O
Rhytidiadelphus squarrosus	Springy Turf- moss	O
Rosa sp.	Roses	O
Rubus fruticosus agg.	Brambles	O
Rubus tricolor	Chinese Bramble	O
Salix sp.	Willow	O
Sambucus nigra	Elder	R

Treeline - WL1 (Drainage ditch - FW4)		**DAFOR**
*Acer pseudoplatanus**	Sycamore	R
Anthriscus sylvestris	Cow Parsley	O
Arum maculatum	Lords-and-Ladies	O
Asplenium adiantum-nigrum	Black Spleenwort	O
Asplenium scolopendrium	Hart's-tongue	O
Brachypodium sylvaticum	False Brome	R
Crataegus monogyna	Hawthorn	F
*Fagus sylvatica**	Beech	R

Ficaria verna	Lesser Celandine	O
Filipendula ulmaria	Meadowsweet	O
Fraxinus excelsior	Ash	F
Galium aparine	Cleavers	F
Hedera helix	Common Ivy	A
Ligustrum vulgare	Wild Privet	O
Lonicera periclymenum	Honeysuckle	O
Pinus sylvestris	Scots Pine	O
Polystichum setiferum	Soft Shield-fern	O
Prunus spinosa	Blackthorn	F
Quercus sp.	Oak	O
Rubus fruticosus agg.	Brambles	F
Sambucus nigra	Elder	R