Ecological Impact Assessment

Proposed residential development
at Whitestown Way, Tallaght,
Dublin 24

27 August 2018

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Executive Summary

This Ecological Impact Assessment has been prepared by NM Ecology Ltd on behalf of Cluid Housing Association Ltd as part of a planning application for a residential development at Whitestown Way, Tallaght, Dublin 24. The proposed development will consist of four apartment buildings, with associated internal roads, underground parking, open space and services. The aim of this report is to identify, quantify and evaluate the impacts of the proposed development on ecosystems and their components, including designated sites, habitats, flora and fauna.

The proposed development site is located 20 m north of the Tallaght Stream, which provides a potential hydrological pathway to the Dodder Valley proposed Natural Heritage Area (pNHA), which is approx. 2.5 km downstream. In response, a range of pollution-prevention measures will be implemented during the construction of the proposed development, which will ensure that no pollutants can reach the stream or associated pNHA. There is no risk of impacts on any Natura 2000 sites; a stand-alone *Screening for Appropriate Assessment* report accompanies this application.

Habitats within the proposed development site include amenity grassland, horticultural land, ornamental shrubs and hedgerow / treeline. These habitats are considered to be of negligible floral value, and their removal will have no ecological impact. However, the dense foliage of trees and hedgerows may provide nesting opportunities for birds, so site clearance works will be undertaken outside the nesting season (i.e. October – February, inclusive), or a pre-clearance survey will be carried out by a suitably-qualified ecologist.

An invasive plant species – giant knotweed – was recorded in the east of the site. It is listed on the third schedule of the *EC Birds and Natural Habitats Regulations* 2011 (as amended), and it is an offence to cause it to spread. In response, the contractor will engage an ecologist to develop a site-specific invasive species management plan and apply for a derogation licence from the National Parks and Wildlife Service. All giant knotweed will be removed and treated in advance of construction work.

The proposed development site does not support a bat roost, and is not an important area for feeding or commuting bats. However, the stream and woodland to the south of the site is used by foraging / commuting bats, as part of a larger ecological corridor associated with the Sean Walsh Memorial Park. Some 'bat sensitive' lighting techniques will be incorporated into the lighting plan for the proposed development, which will avoid any light spill in this direction.

Subject to the successful implementation of these measures, it can be concluded that the proposed development will not cause any significant negative impacts on designated sites, habitats, legally protected species, or any other features of ecological importance.

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1 Introduction

1.1 Assessment brief

The aim of this Ecological Impact Assessment (EcIA) is to identify, quantify and evaluate the impacts of the proposed development on ecosystems and their components, including designated sites, habitats, flora and fauna. It has been prepared in accordance with the *Guidelines for Ecological Impact Assessment in the UK and Ireland* (2016), which are the primary resources used by members of the Chartered Institute of Ecology and Environmental Management (CIEEM). The purpose of this document is to:

- Provide an objective and transparent assessment of the potential ecological impacts of the proposed development for all interested parties, including planning authorities and the general public
- Facilitate objective and transparent determination of the consequences of the development in terms of national, regional and local policies relevant to ecology
- Propose the steps will be taken to adhere to legal requirements relating to designated sites and legally protected species (CIEEM 2016).

Although the above guidelines provide a scientifically-rigorous framework for EcIA, some processes also rely on the professional judgement of an ecologist, including survey design, the valuation of ecological features, and the characterisation of impacts. An outline of the author's experience, training and accreditation is provided in the following section, which support his competency to make such judgements.

1.2 Statement of authority

All surveying and reporting was carried out by Nick Marchant, the principal ecologist of NM Ecology Ltd. He has an MSc in Ecosystem Conservation and Landscape Management from NUI Galway and a BSc in Environmental Science from Queens University Belfast. He is a member of the Chartered Institute of Ecology and Environmental Management, and operates in accordance with their code of professional conduct.

He has eleven years of professional experience, including eight years as an ecological consultant, one year as a local authority biodiversity officer, and two years managing an NGO in Indonesia. He has provided ecological assessments for over two hundred developments throughout Ireland and Northern Ireland, including wind farms, infrastructural projects (roads, water pipelines, greenways, etc.), and a range of residential and commercial developments.

2 Methods

2.1 Scoping

The objective of this assessment is to identify any ecological features that may pose a constraint to the proposed development. It involves the following steps:

- Identification of designated sites within an appropriate zone of influence
- A walkover survey incorporating the following elements:
  - Classification and mapping of habitats
  - A search for rare or protected flora, and for any problematic non-native plant species (e.g. Japanese Knotweed)
  - A search for field signs of rare or protected fauna (e.g. badgers), and habitat suitability assessments for species that are shy, nocturnal or seasonal
- Valuation of ecological features, review of legal considerations, and selection of important ecological features
- Assessment of impacts on important ecological features and development of appropriate mitigation strategies

2.2 Data collection and walkover survey

A desk-based scoping study was carried out using data from the following sources:

- Plans and specifications for the proposed development
- Bedrock, soil, subsoil, ground water and surface water maps from the Geological Survey of Ireland webmapping service (www.gsi.ie/mapping.htm), the National Biodiversity Data Centre (http://maps.biodiversityireland.ie/), and the Environmental Protection Agency web viewer (http://gis.epa.ie/Envision/)
- Maps and details of designated sites from www.npws.ie
- Biological records from the National Biodiversity Data Centre online mapping service

The following resources were used for the walkover surveys:

- Habitat surveys were carried out in accordance with the *Best Practice Guidance for Habitat Survey and Mapping* (Smith et al 2011), and using the classification system of *A Guide to the Habitats of Ireland* (Fossitt 2000)
- Flora were identified using *New Flora of the British Isles, 3rd Edition* (Stace 2010), *The Wildflower Key* (Rose 2006), *Grasses, Sedges Rushes and Ferns of the British Isles and northwestern Europe* (Rose 1989) and *The Vegetation Key to the British Flora* (Poland & Clement 2009). Nomenclature follows the plant crib of the Botanical Society of the British Isles (BSBI 2007). The abundance and extent of species is described using the DAFOR scale (Dominant, Abundant, Frequent, Occasional, Rare)

- Fauna surveys followed the methods outlined in the *Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes* (NRA 2006), with reference to other species-specific methods as appropriate.

Desktop data from internet resources was accessed between June and August 2018. A site inspection and bat survey was carried out on the 5th and 6th of June 2018.

Bat survey

The aim of the bat survey was to detect any bat roosts within the site boundary, and to assess the importance of the area for foraging / commuting bats. Survey methods were developed using *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (Bat Conservation Trust, 3rd edition, 2016). An emergence survey was carried out between 21:30 and 23:30 (sunset was at 21:47) on the 5th of June 2018, and a re-entry survey was carried out between 03:30 and 05:10 (sunrise was at 05:00) on the 6th of June. The surveyor walked continuously around the site in order to ensure that any bats emerging from or re-entering the buildings would be recorded. The trees and river to the south of the proposed development site were also surveyed briefly in order to assess the importance of these areas for feeding bats.

All surveying was carried during the peak season of bat activity, and coincided with the maternity period, i.e. the birth and raising of offspring by female bats. Weather conditions at the time of survey were suitable for bats, with mild temperatures, light winds and no rain.

2.3 Valuation of ecological features

Based on the information collected during the desktop and walkover surveys, the ecologist assigns an ecological value to each feature based on its conservation status at different geographical scales (Table 1). For example, a site may be of national ecological value for a given species if it supports a significant proportion (e.g. 5%) of the total national population of that species.

Table 1: The six-level ecological valuation scheme used in the CIEEM guidelines (2016)

Ecological value	Geographical scale of importance
International	International or European scale
National	The Republic of Ireland or the island of Ireland
Regional	Leinster, and/or the east coast of Ireland
County	County Dublin
Local	Suburban areas around Tallaght
Negligible	None, the feature is common and widespread

It is accepted that any development will have an impact on the receiving environment, but the significance of the impact will depend on the value of the ecological features that would be affected. The following is outlined in the CIEEM guidelines: "*one of the key challenges in an EcIA is to decide which ecological features (habitats, species, ecosystems and their functions/processes) are important and should be subject to detailed assessment. Such ecological features will be those that are considered to be important and potentially affected by the project. It is not necessary to carry out detailed assessment of features that are sufficiently widespread, unthreatened and resilient to impacts from the development, and that will remain viable and sustainable."*

For the purposes of this report we have only assessed impacts on ecological features that are of local value or higher (refer to Table 1), or those that receive legal protection. These features are termed 'important ecological features' and are listed in Section 4.6. Impacts on features of negligible ecological value (e.g. amenity grasslands) are not considered to be significant, so they are not included in the impact assessment.

2.4 Ecological Impact Assessment

Potential direct, indirect or cumulative impacts on ecological features can be described in relation to their magnitude, extent, duration, reversibility and timing/frequency, as outlined in the CIEEM (2016) guidelines. Depending on the type of impact and the sensitivities of the important ecological feature, the ecologist may determine that the impact would have a 'significant effect'. The following definitions are provided in the CIEEM guidelines: "*A significant effect is simply 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*". "*For the purpose of EcIA, a 'significant negative effect' is an effect that undermines biodiversity conservation objectives for 'important ecological features', or for biodiversity in general."*. Where significant impacts are identified, measures will be taken to avoid, minimise or compensate for impacts (where possible). Based on these measures, the impact assessment will be repeated, and any residual impacts of the proposed development will be discussed.

3 Development proposals

3.1 Characteristics of the proposed development

The proposed development will consist of four apartment buildings, each of between two and four storeys. The main access point will be in the south-west of the site, and will lead to paved internal roads and on-street parking spaces. Public open space will be provided between the buildings, hedgerows will be planted to provide screening, and trees will be

planted along roadsides and side boundaries. Foul water and surface water will be discharged to local authority foul and storm sewers on the Whitestown Way road.

3.2 Other developments in the surrounding area (potential in-combination effects)

The proposed development site is located in a suburban setting in Tallaght. It is included in zone OS of the South Dublin County Development Plan 2016 – 2022, for which the planning objective is "*to preserve and provide for open space and recreational amenities*". Much of the surrounding areas has been developed in the last 20 years, so it is unlikely to be under significant development pressure in the short to medium term.

Live and recently-approved planning applications in the vicinity of the site were reviewed on the online planning register of South Dublin County Council (DLRCC). A Part VII Application was made in 2016 for the construction of a new stand at the neighbouring Tallaght stadium, which is assumed to have been approved. The stand had not been constructed at the time of writing, so it is possible that it will be constructed in the coming years. A separate Part VII Application was made in 2016 for a series of landscaping works and traffic control measures along the N81 road to the north of the proposed development site; it is also assumed that the application was approved. It is not clear whether these works have taken place at the time of writing, so it is possible that it will be implemented in the coming years.

All other planning applications in the surrounding area were for small-scale works such as residential extensions. There is no risk that any of these minor developments would cause in-combination compacts with the proposed development.

In conclusion, the area surrounding the proposed development site does not appear to be subject to significant development pressure. Nonetheless, two developments were identified that could potentially act in-combination with the proposed development to increase the scale of potential ecological impacts. The risk of in-combination impacts is discussed in the impact assessment.

4 The Receiving Environment

4.1 Environmental setting

The proposed development site is located in a suburban setting near the Centre of Tallaght. The northern boundary is formed by a car park (which serves Tallaght Stadium), the western boundary by the Whitestown Way road, and the southern and eastern boundaries by the Sean Walsh Memorial Park.

The western half of the proposed development site contains an occupied single-storey residence, a number of wooden livestock sheds, and an area of amenity grassland; the latter is used as a 'petting zoo' for domestic fowl and small livestock. The eastern half of the site is surfaced in concrete and used as a storage yard for lawnmowers and other vehicles. There is also a small allotment and polytunnel in the south-eastern corner of the site.

The underlying bedrock is dark limestone and shale of the Calp formation, which is a locally-important aquifer (moderately productive in local zones). Subsoils are limestone till, and soils are deep, well-drained brown earths, with some gravels and alluvium in the vicinity of the stream. On this basis, the site is considered to have relatively good drainage, so most rainfall would percolate to ground rather than flowing overland into surface water drainage features.

The closest watercourse is the Tallaght Stream (also referred to as the Whitestown Stream and River Poddle), which is located 20 m to the south of the proposed development site. The stream has been re-aligned through the Sean Walsh Memorial Park, and has been widened to form a series of ponds. It flows east and merges with the River Dodder approx. 2.5 km downstream, which then flows north-east through Dublin City to join the River Liffey in Dublin Port a further 13 km downstream. Water quality in the Tallaght Stream, as well as the rest of the Dodder catchment, is of moderate status (Water Framework Directive Status Assessments 2010-2015). The transitional / estuarine waters of the River Liffey are also of moderate status.

4.2 Designated sites

The proposed development is not located within any designated sites, so there is no risk of direct impacts. Potential indirect impacts were considered within a potential zone of influence of 2km[1]. One proposed Natural Heritage Area (NHA) was identified within this zone; details are provided in Table 2, and its location is shown in Figure 1.

Table 2: Designated sites within 2km of the proposed development site

Site Name	Distance	Reasons for designation
Dodder Valley pNHA (991)	1.3 km east, and 2.5 km downstream	The last remaining stretch of natural river bank vegetation on the River Dodder before it enters Dublin city. The site is of importance for riparian woodland and its diversity of bird species, including kingfisher and sand martins

[1] For the purposes of this assessment we considered indirect impacts on designated sites within a potential zone of influence of 2km. This distance is considered to be proportionate to the relatively small scale of the proposed development and its suburban setting.

Figure 1	Designated sites
Location	Whitestown Way, Tallaght
Applicant	Cluid Housing Association
Date	22-08-2018

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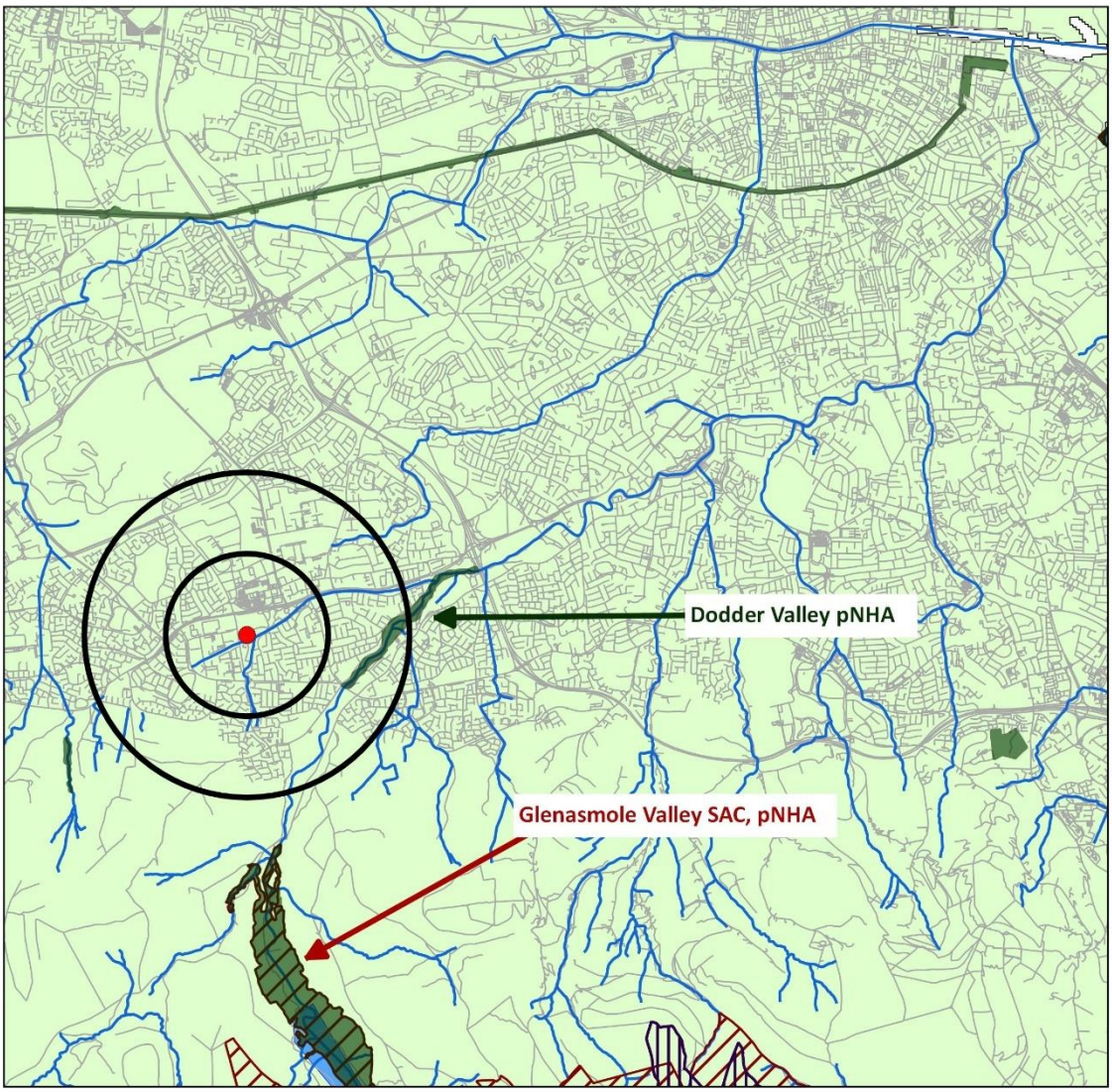
Site location
- Proposed development site
- Buffer zones (1km, 2km)
- Roads
- Watercourses

Designated sites
- Special Areas of Conservation
- Special Protection Areas
- Natural Heritage Areas



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0 1 2 3 4 5 km

Potential pathways for indirect impacts on the pNHA

Indirect impacts can only occur if there is a viable pathway between the source (the proposed development site) and the receptor (the habitats and species for which a site has been designated). The most common pathway for impacts is surface water, for example if a pollutant is washed into a river and carried downstream into a designated site. Other potential pathways are groundwater, air (e.g. sound waves or airborne dust), or land (e.g. flow of liquids, vibration). The zone of effect for hydrological impacts can be several kilometres, but for air and land it is rarely more than one hundred metres. The magnitude of impacts (e.g. the concentration of pollutants) usually decreases as the distance between source and receptor increases. An appraisal of potential pathways for impacts on the pNHA (and other designated sites) is provided below.

The Tallaght Stream (also referred to as the Whitestown Stream and River Poddle), which is located approx. 20 m south of the proposed development site, provides a potential hydrological pathway to the pNHA. If any pollutants from the proposed development site could reach the watercourse, they could be carried downstream into the pNHA. Groundwater is not considered to be a viable pathway to the pNHA due to the distance involved and the filtration provided by intervening soils. The distance involved is also too great for air or land pathways. On this basis, one potential pathway for indirect impacts – the Tallaght Stream – was identified that could provide a pathway for indirect impacts on the Dodder Valley pNHA. This will be addressed in the impact assessment.

A stand-alone assessment of potential indirect impacts on Natura 2000 sites is provided in the accompanying *Screening for Appropriate Assessment* report. Some distant hydrological connections to Natura 2000 sites are considered, but impacts on all sites were screened out.

4.3 Habitats and flora

Habitats within the proposed development site were classified using *A Guide to Habitats in Ireland* (Fossitt 2000). A map of habitats is provided in Figure 2.

Buildings and paved surfaces (BL3)

The site contains a number of buildings, including a two-storey office / welfare facility, a garage / storage room, some shipping containers, a single-storey residence, and some sheds used as animal housing. The storage yard and the driveway of the residence are also surfaced in concrete or asphalt. The only vegetation recorded on any structures was some traveller's-joy *Clematis vitalba*, which is a non-native species. Therefore, all buildings and paved surfaces are considered to be of negligible ecological value.

Figure 2	Habitat map
Location	Whitestown Way, Tallaght
Applicant	Cluid Housing Association
Date	22-08-2018

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Proposed development site
Planning boundary

Habitats
BL3 - Buildings
BL3 - Roads and paved surfaces
GA2 - Amenity grassland
BC2 - Horticultural land
WS3 - Ornamental / non-native shrubs
WL1 - Hedgerow

NM ECOLOGY

0 20 40 60 80 100 m

Amenity grassland (GA2)

There is a small patch of amenity grassland in the west of the site, which is used for grazing livestock associated with the petting zoo. Other patches of grassland are located around the house, and in the east of the site. The dominant plant species is perennial rye-grass *Lolium perenne*, with some Yorkshire-fog *Holcus lanatus* and common bent *Agrostis capillaris*, and some common forbs including daisy *Bellis perennis*, red clover *Trifolium pratense* and dandelion *Taraxacum officinale* ag. A number of young ash trees *Fraxinus excelsior* have been planted within the grassland in the west of the site to provide shade for the livestock.

Amenity grassland is very common in the surrounding area, and is composed of species that are common and widespread throughout Ireland, so it is considered to be of negligible ecological value.

Horticultural land (BC2)

The site contains some small horticultural areas that are used to grow a range of common household fruits, vegetables and herbs. This includes a polytunnel and small garden to the north of the residence, an overgrown herb garden to the west of the administrative building, and a small allotment in the south-eastern corner of the site. Some of the overgrown areas support ruderal plants such as Yorkshire-fog, willowherbs *Epilobium* sp, dandelion and creeping thistle *Cirsium arvense*.

This habitat supports plant species that are non-native and/or common and widespread throughout Ireland, so it is considered to be of negligible ecological value.

Ornamental / non-native shrub (WS3)

A small patch of ornamental shrubs is located near the entrance to the storage yard. It contains a range of shrubs and immature trees, most of which are non-native, including: *Gingko* sp, *Cordyline australis*, a non-native birch *Betula* sp, pedunculate oak *Quercus robur*, Scot's-pine *Pinus sylvestris* and ornamental bamboo. The understorey includes traveller's-joy, a non-native geranium species, and a range of common ruderal plants.

As these species are almost entirely non-native and the trees are immature, their habitat and floral value is considered to be negligible. However, the dense structure of some shrubs may provide secondary value as a habitat for nesting birds, which is discussed in the following section.

Hedgerow (WL1) and treeline (WL2)

Short sections of hedgerow and treeline are located in various parts of the site; for the purposes of this report they are treated as a single habitat type. Beech *Fagus sylvatica* hedges are located to the south of the residence, and on both sides of the allotment in the east of the site. A hawthorn *Crataegus monogyna* hedgerow forms the western boundary of

the site between the amenity grassland and footpath on Whitestown Way. A loose line of immature ash trees has been planted on the southern edge of the amenity grassland, and a line of semi-mature small-leaved lime *Tilia cordata* trees is located on the boundary between the residence and the storage yard.

These hedgerows and treelines are composed of common and widespread species, so their habitat and floral value is considered to be negligible. However, their dense structure provides some secondary value as a habitat for fauna, which is discussed in the following section.

Rare or protected flora

No rare or protected plants were encountered during field surveys.

Invasive plant species

A knotweed species was found in the east of the site in the beech hedgerow between the storage yard and the allotment. Some leaves were 25 – 30 cm length and 20 cm width, which suggests that it may be giant knotweed *Fallopia sachalinensis*, but other leaves were 10 – 20 cm in length, so it is also possible that it is Japanese knotweed *Fallopia japonica* or bohemian knotweed *Fallopia bohemica*, which is the hybrid between these species.

The plants formed a linear strip of approx. 25 m x 3 m along the hedgerow, giving a surface area of approx. 75 m^2. The rhizomes of knotweed species can extend up to 7 m horizontally from stems, so in a worst-case scenario it could have an extent of 400 m^2, of which approx. 315 m^2 is within the proposed development site. The location and extent of giant knotweed is shown in Figure 3.

Giant knotweed and Japanese knotweed are listed as restricted invasive species on the third schedule of the *European Communities (Birds and Natural Habitats) Regulations 2011*. Under regulations 49(2) and 50(1) it is an offence to spread a third-schedule invasive species, or to sell or distribute any plant material or soil containing its roots.

No other third-schedule species were recorded during the site survey. One other species recorded during the site survey – traveller's-joy – is non-native and can be invasive in places, but it is a relatively minor component of the vegetation at this site, it does not have any legal restrictions, and it is likely to be killed during the development of the site, so it is not considered to be an important ecological feature.

Figure 3	Invasive Species
Location	Whitestown Way, Tallaght
Applicant	Cluid Housing Association
Date	22-08-2018

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Proposed development site
Planning boundary

Invasive Species
Giant Knotweed
Potential extent of rhizomes

NM ECOLOGY

0 20 40 60 80 100 m

4.4 Fauna

Birds

Very few birds were observed during the site survey. A blackbird and wren were seen in the storage yard, and a small number of woodpigeons and jackdaws were seen in trees around the site. There was no sign that birds were nesting in any of the trees or buildings at the time of survey, but it is possible that birds may nest in the site at other times of the year.

Suburban areas rarely support significant populations of endangered birds, and the site is considered to be of negligible ecological value in this regard. However, all birds (including nests, eggs and chicks) receive protection under the Wildlife Act 1976 (as amended).

Bats

All buildings were inspected in order to determine their suitability for roosting bats. The single-storey residence has a tile roof and plastic soffit / fascia panels, so it is considered to be of low suitability for roosting bats. The livestock sheds are constructed of wood and have flat bitumen roofs, and also have low suitability for bats. The two-storey office/welfare building in the storage yard is a modern structure with a slate roof and plastic fascia panels; it is also considered to have low suitability for bats. All other storage buildings and containers have negligible suitability for bats. It is noted that all buildings on the site are brightly illuminated at night, which further reduces their suitability for roosting bats. None of the trees within the site boundary had any cracks or crevices that could be used by roosting bats.

Bat activity was very low during the emergence survey. The first bat – a Leisler's – was not recorded until 22:32, approx. 45 minutes after sunset. Two other Leisler's bats were recorded flying over the site at around this time, but they were not seen; this species typically flies in open air approx. 20 – 50 m above ground level, and can be hard to observe. No pipistrelles or any other species were recorded within the proposed development site during the emergence survey. A map of all bat records is provided in Figure 4.

Although the primary focus of the emergence survey was the buildings within the proposed development site, the river and trees to the south of the site were surveyed briefly after the emergence period. One soprano pipistrelle was recorded feeding along the river to the south of the site for approx. 5 – 10 minutes, and two common pipistrelles were recorded around the trees, although they did not remain in the area. Some occasional Leisler's activity was recorded overhead.

Bat activity was also very low during the re-entry survey. A single Leisler's bat was recorded at 04:24 (36 minutes before sunrise), but was not seen. No other bats were recorded for the remainder of the survey, so it is highly unlikely that any bats were roosting within the site.

Figure 4	Bat Survey
Location	Whitestown Way, Tallaght
Applicant	Cluid Housing Association
Date	22-08-2018

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Tel: 087-6839771

Proposed development site
Planning boundary

Bats encountered
- Leisler's bat
- Common pipistrelles
- Soprano pipistrelles

NM ECOLOGY

0 20 40 60 80 100 m

It is likely that the lack of bat activity can be explained by the presence of artificial lighting throughout the site. The storage yard is brightly illuminated by floodlights, which switched on automatically after sunset, and remained permanently active until sunrise. Streetlights in the parking area to the south of the site illuminated the roof of the adjacent residence and livestock sheds. Streetlighting along the Whitestown Way road also illuminated most of the trees and hedgerow in the west of the site. Bats are nocturnal animals that avoid brightly-lit areas, so the level of artificial lighting throughout the site significantly reduces its suitability for roosting, foraging or commuting bats. The allotment in the east of the site, and the nearby river and park, were the only areas in complete darkness.

In conclusion, the proposed development site does not contain a bat roost, and was only used by low numbers of common bat species, so it is considered to be of negligible value. The nearby Tallaght Stream and its associated strip of woody vegetation appears to be used by greater number of bats, and is part of a larger ecological corridor associated with the Tallaght Stream and Sean Walsh Memorial Park. As a result, the stream and woodland to the south of the proposed development site is considered to be of local value as a foraging / commuting area for bats.

Terrestrial mammals

No mammals of any species were observed during field surveys, and no badger setts or any other field signs were recorded. Common species such as fox may pass through the site on an occasional basis, but considering the suburban setting of the site and its lack of vegetation, it is highly unlikely that protected mammals (e.g. badger, otter, pine marten) would use the site on a regular basis. Therefore, the proposed development site is considered to be of negligible importance for all of these species.

Reptiles and amphibians

No reptiles or amphibians were observed during the site survey. There is a small pond in the west of the site that could provide habitat for amphibians, but the water was highly turbid, and there was no submerged vegetation that would be suitable for newt spawning. Therefore, considering the poor condition of the pond, and the suburban setting of the proposed development site, it is considered to be of negligible value for these taxa.

Terrestrial invertebrates

The habitats within the proposed development site are common in suburban landscapes in Ireland, so the site is considered to be of negligible value for invertebrates.

4.5 Potential limitations and information gaps

The walkover survey was carried out in June, which is during the flowering period for most plant species, so it is considered to be an optimal period for botanical surveys. Similarly, the

bat survey was carried out in the peak season of bat activity, and in ideal weather conditions. Most protected mammals are nocturnal and cannot be surveyed during daylight, but this is not considered to be a significant weakness, because the presence of many species can be ascertained based on characteristic field signs, such as droppings, burrows or feeding signs. On this basis the assessment does not have any significant limitations or information gaps.

4.6 Identification of important ecological features

Table 3 provides a summary of all ecological features identified on the site, including their valuation and legal / conservation status. For the purposes of this impact assessment, any features that are of local ecological value, or that receive legal protection, are considered to be 'important ecological features', and will be addressed in the impact assessment.

Table 3: Identification of 'important ecological features' within the proposed development site

Ecological feature	Valuation	Legal status	Important feature?
Proposed Natural Heritage Areas	National	WA	Yes
Hedgerows (WL1) / Treelines (WL2)	Negligible	-	Yes, secondary value for fauna
Ornamental / non-native shrubs (WS3)	Negligible	-	Yes, secondary value for fauna
Buildings and artificial surfaces (BL3)	Negligible	-	No
Amenity grassland (GA2)	Negligible	-	No
Horticultural land (BC2)	Negligible	-	No
Dry meadow (GS3)	Negligible	-	No
Bats	Negligible	HR, WA	Yes
Birds	Negligible	WA	No
Other terrestrial mammals	Negligible	-	No
Reptiles and amphibians	Negligible	-	No
Invertebrates	Negligible	-	No

** HR – European Communities (Birds and Natural Habitats) Regulations 2011 (as amended); WA - protected under Section 19 or 20 of the Wildlife Act 1976 (as amended)*

In summary, the important ecological features relevant to the proposed development site are the Dodder Valley pNHA, hedgerow / treeline / ornamental shrub habitat, and bats (specifically the stream and woodland to the south of the proposed development site).

5 Predicted Impacts of the Proposed Development

5.1 Potential indirect impacts on the Dodder Valley pNHA (construction phase)

As noted in Section 4.2, the Tallaght Stream (also referred to as the Whitestown Stream and River Poddle), which is located approx. 20 m south of the proposed development site, provides a potential hydrological pathway to the Dodder Valley pNHA. If any pollutants (e.g. suspended sediments) from the proposed development site reached the stream during construction works, and were carried 2.5 km downstream to its point of confluence with the River Dodder, then it could reach the Dodder Valley pNHA. The pNHA is designated for riparian woodland and a range of riparian and woodland birds, and some of these species would be vulnerable to waterborne pollutants. However, considering the distances involved and the dilution effect of the intervening waters, the hydrological connection between the proposed development site and the pNHA is considered to be quite weak.

A hypothetical impact assessment of potential pollution incidents is difficult, as any potential impacts would vary depending on: the type of pollutant, the quantity of material entering the river, the rate at which it would occur, the time of year, and/or any potential 'in-combination' effects from other proposed developments along the Tallaght Stream (refer to Section 3.2). Minor pollution incidents would be diluted by the river, reducing the concentration of pollutants to negligible levels before they reached the pNHA. Larger incidents may have a localised impact within the pNHA, but would be unlikely to affect the overall integrity of the site. Nonetheless, if a precautionary approach is adopted it is possible in a worst-case scenario that a large-scale pollution event could cause significant impacts on some bird species within the pNHA. Therefore, in accordance with best practice, it is recommended that appropriate mitigation measures are employed during construction in order to reduce the risk and magnitude of potential pollution incidents.

During the operation of the proposed development, rainwater will either percolate to ground in green areas (the underlying soils are well-drained), or would be collected in gutters / drains and discharged to a local authority storm sewer on Whitestown Way. Foul water will be discharged to a local authority foul sewer on Whitestown Way and treated in the Ringsend Waste Water Treatment Works. Therefore, neither would reach the Tallaght Stream, and neither poses a pollution risk to the pNHA.

5.2 Habitat loss during site clearance works (construction phase)

All existing hedgerows and treelines will be removed at the start of the construction phase. The majority of these trees and shrubs are non-native, and they are of negligible floral value, so their removal will not have any ecological impact.

However, some of the vegetation may be of secondary value for nesting birds and other fauna. If the trees are cleared during the bird nesting season (usually between March and August, inclusive), it is possible that active nests could be destroyed. The killing of any birds or the disturbance of their breeding / resting places would constitute an offence under the *Wildlife Act* 1976 (as amended).

5.3 Spread of invasive species (construction phase)

Giant knotweed covers an area of approx. 75 m^2 within the site boundary, and it is possible that its underground rhizomes may be present in an additional 200 m^2. If construction work proceeds without control measures, it is likely that fragments of knotweed stem and rhizome would be spread within the site boundary. Knotweed can readily regrow from plant fragments, so it is likely that there would be extensive new growth after the completion of construction works. It is also possible that knotweed could be spread outside the site boundary if any contaminated soils were removed from the site, or if plant fragments were snagged on construction vehicles. As giant knotweed is a restricted invasive species, any spread of the plant would constitute an offence under the *EC (Birds and Natural Habitats) Regulations 2011 (as amended)*.

5.4 Impacts on bat foraging / commuting habitat (construction and operational phases)

The Tallaght Stream and its associated woodland appear to be of importance as a feeding area / commuting route for bats, and are part of a larger ecological corridor associated with the Sean Walsh Memorial Park. The proposed development will not involve any changes to the stream or associated vegetation, so there is no risk of direct impacts on the foraging / commuting habitat. However, if the proposed development caused an increase in artificial light in the area, it could cause indirect impacts on the feature. Bats typically avoid any areas with artificial lighting, so any illumination of the river corridor and associated vegetation could displace bats from this important foraging / commuting habitat.

A detailed lighting plan for the site has not yet been developed, as this typically occurs in the latter stages of the construction of a residential development. However, if it caused additional illumination outside the site boundary, there is a risk that it could displace bats from the foraging / commuting habitat, which would have an ecological impact of local significance.

5.5 Potential in-combination impacts with other developments (all phases)

Two other developments were identified in Section 3.2 that could potentially be constructed at the same time as the proposed development: an extension to the adjacent sports stadium, and a range of landscaping and traffic control measures along the N81 road. If these

developments took place at the same time as the proposed development, and if they accidentally caused any pollution of the Tallaght Stream, it is possible that they could increase the significant of impacts discussed in Section 5.1. In response, best-practice pollution-prevention measures will be employed during the construction of the proposed development in order to ensure that it will have no impact on water quality.

There is no mention of giant knotweed in the Part VIII applications for either development, so it is assumed that it is not present on these sites. Neither development would involve significant vegetation clearance or additional lighting, and so there is no risk that they would increase the significance of impacts discussed in Section 5.2 or 5.3.

6 Proposed mitigation measures

This section outlines a series of measures that will be implemented to avoid or minimise the impacts described above. Some of these measures (notably Sections 6.3 and 6.4) are specialist activities, so the contractor will need to employ an Ecological Clerk of Works (ECoW) to assist with their interpretation and implementation. The engagement of an ECoW should be included as a condition of planning.

6.1 Pollution-prevention measures for the construction phase

The proposed development site is approx. 20m from the Tallaght Stream, which provides a potential hydrological connection to the Dodder Valley pNHA. Some habitats and fauna within the pNHA are highly sensitive to pollution, so it is important that all pollutants (e.g. suspended sediments, fuels and cement) are carefully controlled during the construction of the proposed development. Therefore, a range of best-practice pollution-prevention measures will be implemented during construction works, in order to ensure that no pollutants can leave the boundaries of the proposed development site. These are standard mitigation measures, and there is a high degree of confidence in their success.

Concrete and cement

These products are highly toxic to fauna, particularly fish and other aquatic / marine species. It is expected that some pouring and/or mixing of concrete or cement will be required during construction works, so the following measures will be implemented in order to retain all cement-based materials within the boundaries of the proposed development site:

- If any on-site mixing of concrete is required, it will only be carried out in the north of the site, i.e. as far as possible from the Tallaght Stream. If any cement-based products will be stored on site, they will be kept in a sheltered area in the north of the site.

- Ready-mix lorries and larger plant will not be cleaned on-site; they will be taken to an appropriate off-site facility with capacity to capture and treat contaminated wash waters.
- If any on-site cleaning of tools or concrete-batching plant is required, it will take place in the north of the site. Wash waters will be discharged to an on-site soakaway area located as far as possible from the watercourse.
- Concrete pouring / mixing will only take place in dry weather conditions. It will be suspended if high intensity local rainfall events are forecast (e.g. >10 mm/hr, >25 mm in a 24 hour period or high winds).

Suspended sediments

The term 'suspended sediments' refers to any silt, mud or other fine sediment that becomes dissolved in water. Water can be contaminated by suspended sediments (SS) from open earthworks and excavations (either from rainfall or groundwater seepage), from rainfall on soil/sediment stock-piles, or from the tyres / tracks of construction vehicles. In order to retain such all contaminated waters within the boundary of the proposed development site, the following measures will be implemented:

- The storage yard in the east of the proposed development site is entirely paved with concrete, and has a system of drains to collect rainwater. The ultimate destination of the drainage network is not known, but it is likely to either be a storm water drain on a local road, or a direct discharge into the Tallaght Stream. In order to prevent any discharge of suspended sediments (or other pollutants) to the stream, the existing drainage network will be decommissioned at the start of construction works. This will ensure that all pollutants are retained within the proposed development site.
- Excavation works will be suspended if high intensity local rainfall events are forecast (e.g. >10 mm/hr, >25 mm in a 24 hour period, or high winds).
- If any excavations need to be dewatered, the SS-contaminated water will be retained and treated within the boundary of the proposed development site. It will be collected and pumped into a settlement tank (or similar feature), left undisturbed until sediments have settled, and then discharged via a buffered outflow to a soakaway in the north of the site (i.e. as far as possible from the Tallaght Stream)
- Stockpiles of mud, sand or other fine sediments will be stored in the north of the proposed development site, i.e. as far as possible from the river. Stockpiles will be levelled and compacted, and will be covered with plastic sheeting in order to limit wind/rainwater erosion.

Hydrocarbons and chemicals

Hydrocarbons (oil, petrol, diesel, etc) and solvents are toxic to fauna. These chemicals can enter surface water or groundwater if they are accidentally spilled (e.g. during re-fuelling of machinery), or from leaking containers. In order to retain such materials within the boundaries of the proposed development site, the following measures will be applied throughout the construction works:

- Any fuel, oil or chemical containers will be kept in the north of the proposed development site, i.e. as far as possible from the stream. These pollutants are hazardous and must be stored in a designated bunded area that has sufficient capacity to retain any spills.
- All machinery should be protected from vandalism and unauthorised interference, and should be turned off and securely locked overnight
- If any on-site re-fuelling is required, it will take place in the east of the site in a bunded / impermeable area. Immobile plant will be refuelled over drip-trays.
- While in operation, diesel pumps, generators or other similar equipment will be placed on drip trays to catch any leaks.
- A spill kit will be kept on site. If any spills occur, appropriate measures will be taken to intercept hydrocarbons or chemicals on-site before they can leave the site.

6.2 Protection of trees and birds during site clearance works

Under Sections 22 and 23 of the *Wildlife Act* 1976 (as amended), it is an offence to kill or injure a protected bird, or to disturb their breeding / resting places. Most birds nest between March and August (inclusive), so it is strongly recommended that site clearance works are carried out between September and February (inclusive), i.e. outside the nesting season. If this is not possible, an ecologist will survey the affected areas in advance in order to determine whether any protected fauna are present. If any are encountered, the vegetation clearance will be delayed until the chicks have fledged and the nest has been abandoned.

6.3 Management of invasive species

All work will be carried out in accordance with the UK Property Care Association's *Code of Practice for the Management of Japanese knotweed*. Although the guidelines were developed for Japanese knotweed, they also apply to giant knotweed, as the ecology of both species is very similar. It is unlikely that there will be sufficient time to implement a herbicide treatment at the proposed development site in advance of construction works, because this typically takes at least three years. Therefore, the knotweed will need to be removed in advance of construction and either buried on site within a cell of root-barrier membrane, or sent off-site for treatment at an approved facility (typically an incinerator or purpose-built landfill).

A derogation licence will be required from the National Parks and Wildlife Service to permit the excavation and transfer of soil or spoil that is contaminated with knotweed. An ecologist will be engaged by the construction contractor to prepare a site-specific management plan and to apply for a derogation licence. The management plan will include the following components:

- 'Bio-security' measures to prevent the accidental spread of giant knotweed in advance of mitigation works
- Procedures for the excavation of giant knotweed and its associated rhizomes
- Proposals for the management of excavated material, either by burial on site or disposal to a licensed treatment facility.
- A monitoring strategy to identify and spot-treat any regrowth for at least three years after construction works.

6.4 Bat-sensitive lighting

Potential indirect impacts on bat foraging / commuting habitat along the Tallaght Stream were identified in the impact assessment. A detailed lighting plan for the site has not yet been developed, as this typically occurs in the latter stages of the construction of a residential development. However, if 'bat-sensitive' lighting techniques are incorporated into the lighting plan, they would avoid or minimise any potential impacts of lighting on bats.

'Bat-sensitive lighting' for this development would have the following design principles, which are taken from the *Bats and Lighting* guidelines (Stone 2013):

- Low-UV LEDs or low / high pressure sodium lamps will be the preferred bulb type, as they have least effect on bats. Mercury or metal halide bulbs will not be used.
- All external lights will be fitted with directional hoods and/or luminaires to direct the light onto targeted areas and to prevent unnecessary light-spill.
- No lights will be directed towards the south of the site, and there will be no light spill beyond the southern boundary
- Where lighting is required for pedestrian safety (e.g. at site entrances and internal paths), lights will be installed at a low level, e.g. on lighting poles of up to 1 - 2 metres in height. Lights will be directed onto ground level, with no light spill above the horizontal. Lux levels will be the minimum required for pedestrian safety
- External lights at site entrances will be fitted with motion sensors and timers in order to provide light only when required. Constant, overnight lights will not be permitted.

These measures will apply both to temporary lighting during the construction of the proposed development, and to permanent lighting during the operation of the development. In order to ensure that these techniques are effective, and that bat mitigation measures can be balanced with public safety requirements, the developer will employ an ecologist to liaise with the contractor on the lighting design.

7 Residual Impacts

The proposed pollution-prevention measures will prevent fine sediments, concrete/cement, hydrocarbons and other pollutants from reaching the Tallaght Stream, and the downstream Dodder Valley pNHA. Subject to the successful implementation of these measures, the proposed development will not have any effect on water quality in the stream, the pNHA or on any other designated sites. A *Screening for Appropriate Assessment* report accompanies this document.

Any removal of trees, scrub and hedgerow habitats would take place outside the season of peak nesting activity in birds, or the area would be surveyed by an ecologist to confirm that no protected fauna were present. As a result, there would be no impact on local bird or mammal populations, and no legal offence under the *Wildlife Act 1976* (as amended).

The contractor will engage an ecologist to develop a site-specific invasive species management plan and to apply for a derogation licence from the National Parks and Wildlife Service. This will ensure that no giant knotweed is spread during construction works, and that there is no offence under the *EC (Birds and Natural Habitats) Regulations 2011*.

Bat-sensitive lighting techniques will be incorporated into the lighting plan in order to avoid light-spill onto the bat foraging / commuting habitat to the south of the site. As a result, there will be no impact on local bat populations.

Subject to the successful implementation of these measures, we conclude that the proposed development will not cause any significant negative impacts on designated sites, habitats, legally protected species, or any other features of ecological importance.

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