Natura Impact Statement

Castlelake Strategic Housing Development (SHD)

Prepared by: Moore Group – Environmental Services

1 June 2022

On behalf of BAM Property

Project Proponent	BAM Property
Project	Castlelake Strategic Housing Development (SHD)
Title	Natura Impact Statement Castlelake Strategic Housing Development (SHD)

Project Number	21290	**Document Ref**	21290 Castlelake SHD NIS Rev1	
Revision	**Description**	**Author**		**Date**
Rev1	Issued for client review	G. O'Donohoe		1 June 2022
Moore Archaeological and Environmental Services Limited				

Abbreviations

AA	Appropriate Assessment
ABP	An Bord Pleanála
CEMP	Construction & Environmental Management Plan
EEC	European Economic Community
EPA	Environmental Protection Agency
EU	European Union
FWPM	Freshwater Pearl Mussel
GIS	Geographical Information System
IW	Irish Water
LAP	Local Area Plan
NHA	Natural Heritage Area
NIS	Natura Impact Statement
NPWS	National Parks and Wildlife Service
OSI	Ordnance Survey Ireland
pNHA	proposed Natural Heritage Area
SAC	Special Area of Conservation
SPA	Special Protection Area
SuDS	Sustainable Drainage System

TABLE OF CONTENTS **PAGE**

Appendix 1 – AA Screening

Appendix 2 – CEMP

Appendix 3 – Invasive Species Management Plan

1. Introduction

1.1. General Introduction

This Natura Impact Statement (NIS) has been prepared by Moore Group – Environmental Services on behalf of BAM Property. This NIS report contains information to assist the competent authority in carrying out an in carrying out an Appropriate Assessment (AA) for the purposes of Article 6(3) of the Habitats Directive and section 177V of the Planning and Development Act 2000, as amended, (the "Planning Acts") in respect of the construction and operation of Castlelake Strategic Housing Development at Carrigtwohill, Co. Cork (hereafter referred to as the Proposed Development).

This NIS informs the Appropriate Assessment process in the determination of any adverse effects on the integrity of European sites, having regard to their conservation objectives and in light of best scientific knowledge. It is necessary that the Project has complies with Article 6 of the Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (as amended) (referred to as the Habitats Directive). This is transposed into Irish Law by Part XAB of the Planning and Development Act 2000 as amended and the European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. 477) (referred to as the Habitats Regulations). The focus of the assessment is on objectively assessing by reference to the evidence as to whether the Proposed Development will adversely affect the integrity of European sites in light of their conservation objectives.

1.2. Legislative Background - The Habitats and Birds Directives

Article 6 of the Habitats Directive is transposed into Irish Law inter alia by the Part XAB of the Planning Acts (section 177U and 177V) governing the requirement to carry out appropriate assessment screening and appropriate assessment, where required, per Section 1.1 above.

The Habitats Directive (Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora) is the main legislative instrument for the protection and conservation of biodiversity in the European Union (EU). Under the Habitats Directive, Member States are obliged to designate Special Areas of Conservation (SACs) which contain habitats or species considered important for protection and conservation in an EU context.

The Birds Directive (Council Directive 2009/147/EC on the conservation of wild birds), transposed into Irish law by the Habitats Regulations 2011, is concerned with the long-term protection and management of all wild bird species and their habitats in the EU. Among other things, the Birds Directive requires that Special Protection Areas (SPAs) be established to protect migratory species and species which are rare, vulnerable, in danger of extinction, or otherwise require special attention.

SACs designated under the Habitats Directive and SPAs, designated under the Birds Directive, form a pan-European network of protected sites known as Natura 2000. The Habitats Directive sets out a unified system for the protection and management of SACs and SPAs. These sites are also referred to as European sites.

Articles 6(3) and 6(4) of the Habitats Directive set out the requirement for an assessment of proposed plans and projects likely to have a significant effect on Natura 2000 sites.

Article 6(3) establishes the requirement to screen all plans and projects and to carry out an appropriate assessment if required (Appropriate Assessment (AA)). Article 6(4) establishes requirements in cases of imperative reasons of overriding public interest:

> ***Article 6(3):*** *"Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subjected to an appropriate assessment of its implications for the site in view of the site's conservation objectives. In light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public."*

These obligations in relation to Appropriate Assessment have been implemented in Ireland under Part XAB of the Planning and Development Act 2000, as amended, and in particular Section 177U and Section 177V thereof.

Section 177T(1)(b) and (2) state as follows with regard to a Natura Impact Statement:

> *"(b) A Natura impact statement means a statement, for the purposes of Article 6 of the Habitats Directive, of the implications of a proposed development, on its own or in combination with other plans or projects, for one or more than one European site, in view of the conservation objectives of the site or sites."*
>
> *"(2) Without prejudice to the generality of subsection (1), a Natura impact report or a Natura impact statement, as the case may be, shall include a report of a scientific examination of evidence and data, carried out by competent persons to identify and classify any implications for one or more than one European site in view of the conservation objectives of the site or sites."*

1.3. Methodology

The Commission's methodological guidance (EC, 2002, 2018, 2021 see Section 1.4 below) promotes a four-stage process to complete the AA and outlines the issues and tests at each stage. An important aspect of the process is that the outcome at each successive stage determines whether a further stage in the process is required.

Stages 1 and 2 deal with the main requirements for assessment under Article 6(3). Stage 3 may be part of Article 6(3) or may be a necessary precursor to Stage 4. Stage 4 is the main derogation step of Article 6(4).

Stage 1 Screening: This stage examines the likely effects of a project either alone or in combination with other projects upon a Natura 2000 site and considers whether it can be objectively concluded that these effects will not be significant. In order to screen out a project, it must be excluded, on the basis of objective information, that the Proposed Development, individually or in combination with other plans or projects, will have a significant effect on a European site.

Stage 2 Appropriate Assessment: In this stage, there is a consideration of the impact of the project with a view to ascertain whether there will be any adverse effect on the integrity of the Natura 2000 site either alone or in combination with other projects or plans, with respect to the site's structure and function and its conservation objectives. Additionally, where there are predicted impacts, an assessment of the potential mitigation of those impacts is considered.

Stage 3 Assessment of Alternative Solutions: This stage examines alternative ways of implementing the project that, where possible, avoid any adverse impacts on the integrity of the Natura 2000 site.

Stage 4 Assessment where no alternative solutions exist and where adverse impacts remain: Where imperative reasons of overriding public interest (IROPI) exist, an assessment to consider whether compensatory measures will or will not effectively offset the damage to the sites will be necessary.

1.4. Guidance

The NIS has been compiled in accordance with guidance contained in the following documents:

- Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities. (Department of Environment, Heritage and Local Government, 2010 rev.).
- Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities. Circular NPWS 1/10 & PSSP 2/10.
- Assessment of Plans and Projects Significantly Affecting Natura 2000 sites: Methodological Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC (European

Commission Environment Directorate-General, 2001); hereafter referred to as the EC Article 6 Guidance Document.

- Managing Natura 2000 Sites: The Provisions of Article 6 of the Habitat's Directive 92/43/EEC (EC Environment Directorate-General, 2000); hereafter referred to as MN2000.
- Managing Natura 2000 Sites: The Provisions of Article 6 of the Habitat's Directive 92/43/EEC (EC, 2018).
- Guidance document on the strict protection of animal species of Community interest under the Habitats Directive (EC, 2021).
- Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC (EC, 2021).
- Office of the Planning Regulator (OPR) Practice Note PN01 Appropriate Assessment Screening for Development Management (OPR, 2021).

1.5. Data Sources

Sources of information that were used to collect data on the Natura 2000 network of sites, and the environment within which they are located, are listed below:

- The following mapping and Geographical Information Systems (GIS) data sources, as required:
    - National Parks & Wildlife (NPWS) protected site boundary data;
    - Ordnance Survey of Ireland (OSI) mapping and aerial photography;
    - OSI/Environmental Protection Agency (EPA) rivers and streams, and catchments;
    - Open Street Maps;
    - Digital Elevation Model over Europe (EU-DEM);
    - Google Earth and Bing aerial photography 1995-2022;
- Online data available on Natura 2000 sites as held by the National Parks and Wildlife Service (NPWS) from www.npws.ie including:
    - Natura 2000 - Standard Data Form;
    - Conservation Objectives;
    - Site Synopses;
- National Biodiversity Data Centre records;
    - Online database of rare, threatened and protected species;
    - Publicly accessible biodiversity datasets.
- Status of EU Protected Habitats in Ireland. (National Parks & Wildlife Service, 2019); and
- Relevant Development Plans in neighbouring areas;
    - Cork County Development Plan 2022 - 2028

1.6. Statement of Authority

This report was compiled by Ger O'Donohoe (B.Sc. Applied Aquatic Sciences (GMIT, 1993) & M.Sc. Environmental Sciences (TCD, 1999)) who has over 27 years' experience in environmental impact assessment and has completed numerous reports for Appropriate Assessment Screening and Natura Impact Statements in terrestrial and aquatic habitats.

Habitat and Bird Survey Assessments were provided by Malachy Walsh & Partners which also prepared the Report for AA Screening (Appendix 1).

The drainage design has been prepared by RPS and a Flood Risk Assessment has been prepared by Jacobs.

1.7. Description of the Project

The proposed development will consist of the construction of a strategic housing development of 716 no. units and a 2 no. storey creche. The proposed development comprises 224 no. houses, 284 no. duplex units and 208 no. apartments. The two storey houses comprise 48 no. detached, 126 no. semi-detached and 50 no. terraced Houses containing 60 no. two bed units, 139 no. three bed units and 25 no. four bed units. The part-one to part-three storey duplex units are contained in 122 no. buildings providing 82 no. one bed units, 142 no. two bed units and 60 no. three bed units. There are 7 no. apartments blocks ranging in height from part-1 to part- 5 no. storeys at Carrigtwohill, Co. Cork.

The proposed development also provides for: hard and soft landscaping; boundary treatments; public realm works; car parking; bicycle stores and shelters; bin stores; lighting; plant rooms; and all ancillary site development works above and below ground.

There are a number of waterbodies on site. The Woodstock stream leading to the Anngrove Stream is the largest stream which enters the eastern-most land block near Station Road and flows in a westerly direction before turning south where it flows into the Slatty Pond, which is hydrological connected Great Island SAC (001058) and Cork Harbour SPA (004030). Another small stream bisects the main land block and flows in a southerly direction towards the Woodstock Stream at the southwest of the site.

There is a man-made lake (attenuation pond/lagoon) to the south of the main land block which is currently used as an amenity by local residents. The pond has an overflow into the Woodstock Stream.

The Woodstock Stream joins with a transitional waterbody named Slatty Pond which is located just east of the Slatty Bridge, approximately 900m southwest of the closest point of the proposed development.

This transitional water flows under Slatty Bridge, into Slatty Water and on to Lough Mahon (Harpers Island), another transitional waterbody.

Data from the EPA's Water Framework Directive (WFD) monitoring depicts the Lough Mahon as having 'moderate' water quality (2013-2018). There is no WFD monitoring data for Slatty Bridge or any of the waterbodies on or leaving the site. The Woodstock Stream is not a designated salmonoid river and is not in an area designated for Freshwater pearl Mussel.

The EPA has classed the risk of Lough Mahon (Harpers Island) of failing to meet its WFD objectives as 'At risk'.

Wastewater will be directed to municipal sewer and surface water will be treated as per EPA and SuDS best practice guidance. The proposed development will require the contractor to complete a Construction Environmental Management Plan (CEMP). The management plan includes measures for the and protection of water courses on site prior to and during site development.

1.8. Construction Management

A Construction Environmental Management Plan (CEMP) has been prepared and will be further developed prior to commencement of construction to manage the effects of construction activities associated with the Proposed Development. Refer to **Appendix 2**.

The CEMP sets out the principles to be adhered to and outlines the agreed measures that will be implemented during the construction of the development to ensure that potential environmental effects and disturbance will be minimised or eliminated.

It will be the responsibility of the project proponent and contractor employed to update and add (where required) specific control measures relevant to the environmental management plan and procedures, taking into account any conditions imposed on any planning permissions granted. The control measures will be amended by improvement with regards to environmental protection and will take cognisance of additional environmental commitments arising from planning conditions.

The Project Proponent will oversee the process through appointment of the contractor with input from the Project engineer and oversight from the planning and project team. The contractor will be contractually obliged to comply with the CEMP.

Figure 1 shows the proposed Project location and Figure 2 shows a detailed view of the proposed Project boundary on recent aerial photography. Figure 3 presents a plan of the proposed Project.

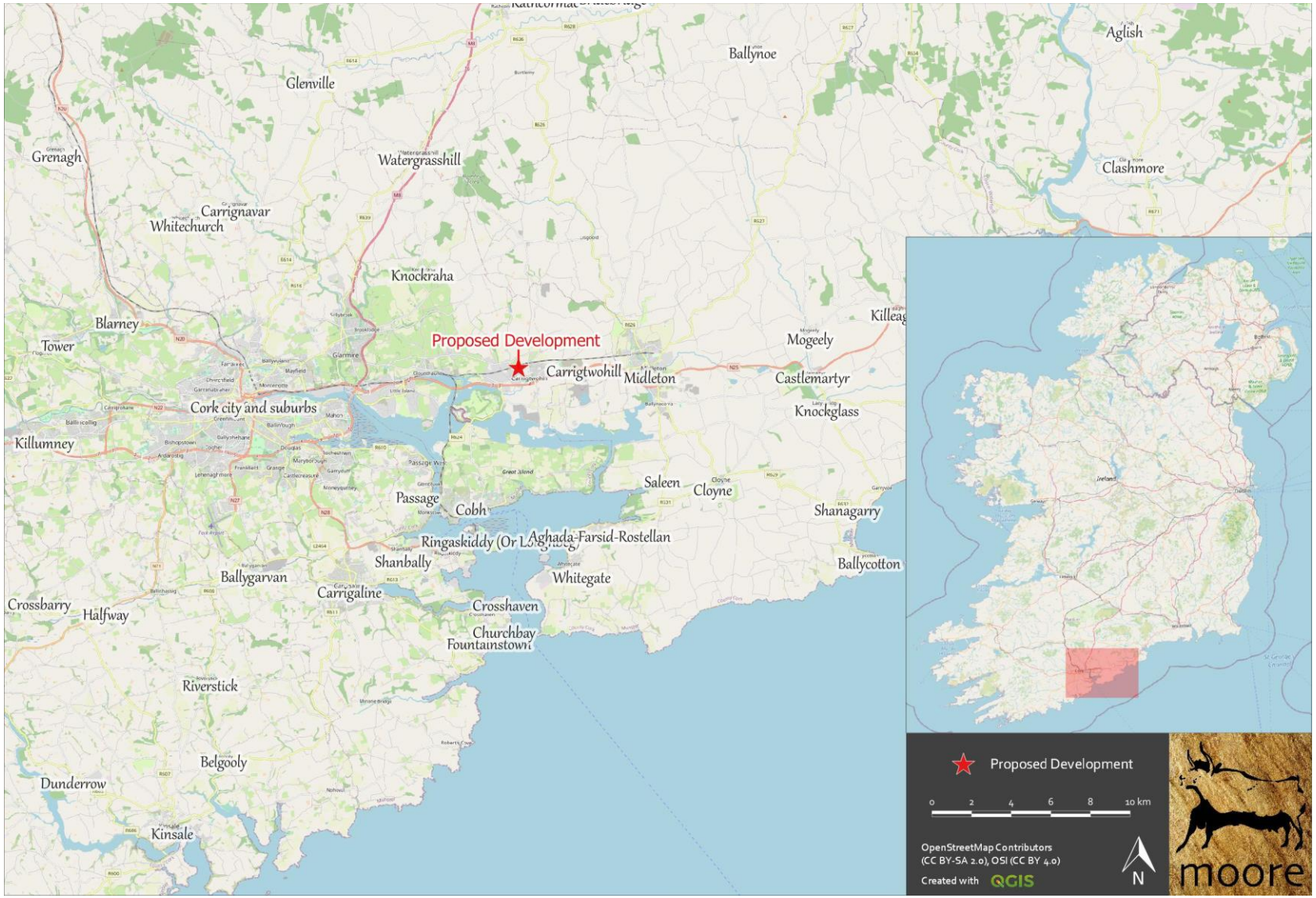


Figure 1. Showing the Project location at, Carrigtwohill, County Cork.

Figure 2. Showing the Project site on recent aerial photography, with the Woodstock (Anngrove) Stream visible to the south of the Project site.

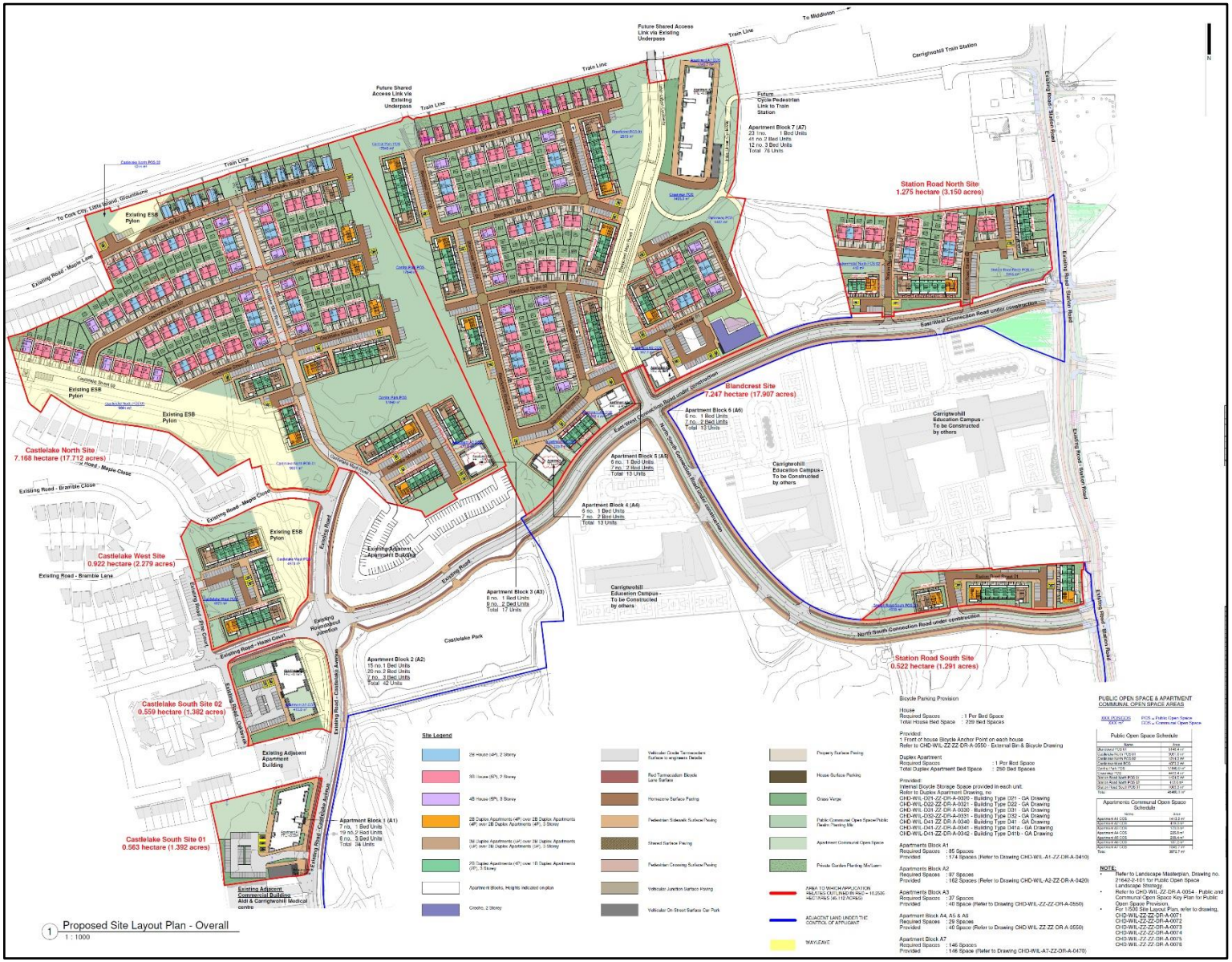


Figure 3. Plan of the proposed Project.

2. Stage 1 – Screening for Appropriate Assessment

The potential for source pathway receptor connectivity was firstly identified through GIS interrogation and detailed information was then provided on sites with connectivity. European sites that are located within a potential Zone of Influence of the Overall Development are listed in Table 1 and presented in Figures 4 and 5, below. Spatial boundary data on the Natura 2000 network was extracted from the NPWS website (www.npws.ie) on 31 May 2022. This data was interrogated using GIS analysis to provide mapping, distances, locations and pathways to all sites of conservation concern including pNHAs, NHAs and European sites.

Table 1 European Sites located within the potential Zone of Influence[1] of the Proposed Development.

Site Code	Site name	Distance (km)[2]
001058	Great Island Channel SAC	0.01
004030	Cork Harbour SPA	0.01

The nearest European sites to the Proposed Development are associated with Cork Harbour and include the Great Island Channel SAC (Site Code 001058) and the Cork Harbour SPA (Site Code 004030). It is noted in the AA screening report produced by Malachy Walsh and Partners for the proposed development that the Blackwater River (Cork/Waterford) SAC (Site code 002170) is within 15km of the proposed development area (*circa* 12.2km at the nearest point). Refer to **Appendix 2**. Potential for impacts on this protected area was screened out in that report in the absence of any feasible source-pathway-receptor model linking the Blackwater River (Cork/Waterford) SAC with the proposed development. This document concurs with that finding and does not consider impacts on the Blackwater River (Cork/Waterford) SAC further.

A worst-case scenario may be considered whereby the proposed development would be the source of a significant detrimental change in water quality in Slatty Pond or Lough Mahon either alone or in combination with the other projects or plans as a result of indirect pollution via the Woodstock Stream without the application of standard mitigation measures. The effect would have to be considered in terms of changes in water quality which would affect the habitats or food sources of the species for which the Cork Harbour European sites are designated.

[1] All European sites potentially connected irrespective of the nature or scale of the Proposed Development.

[2] Distances indicated are the closest geographical distance between the Proposed Development and the European site boundary, as made available by the NPWS.

it is concluded that in line with Departmental Guidance and having regard to ECJ case law and the 'Precautionary Principle', a Natura Impact Statement be prepared for the purpose of Article 6(3) of the Habitats Directive and Part XAB of the Planning and Development Act, 2000, as amended.

Stage 2 Appropriate Assessment of the Project has been prepared as follows.

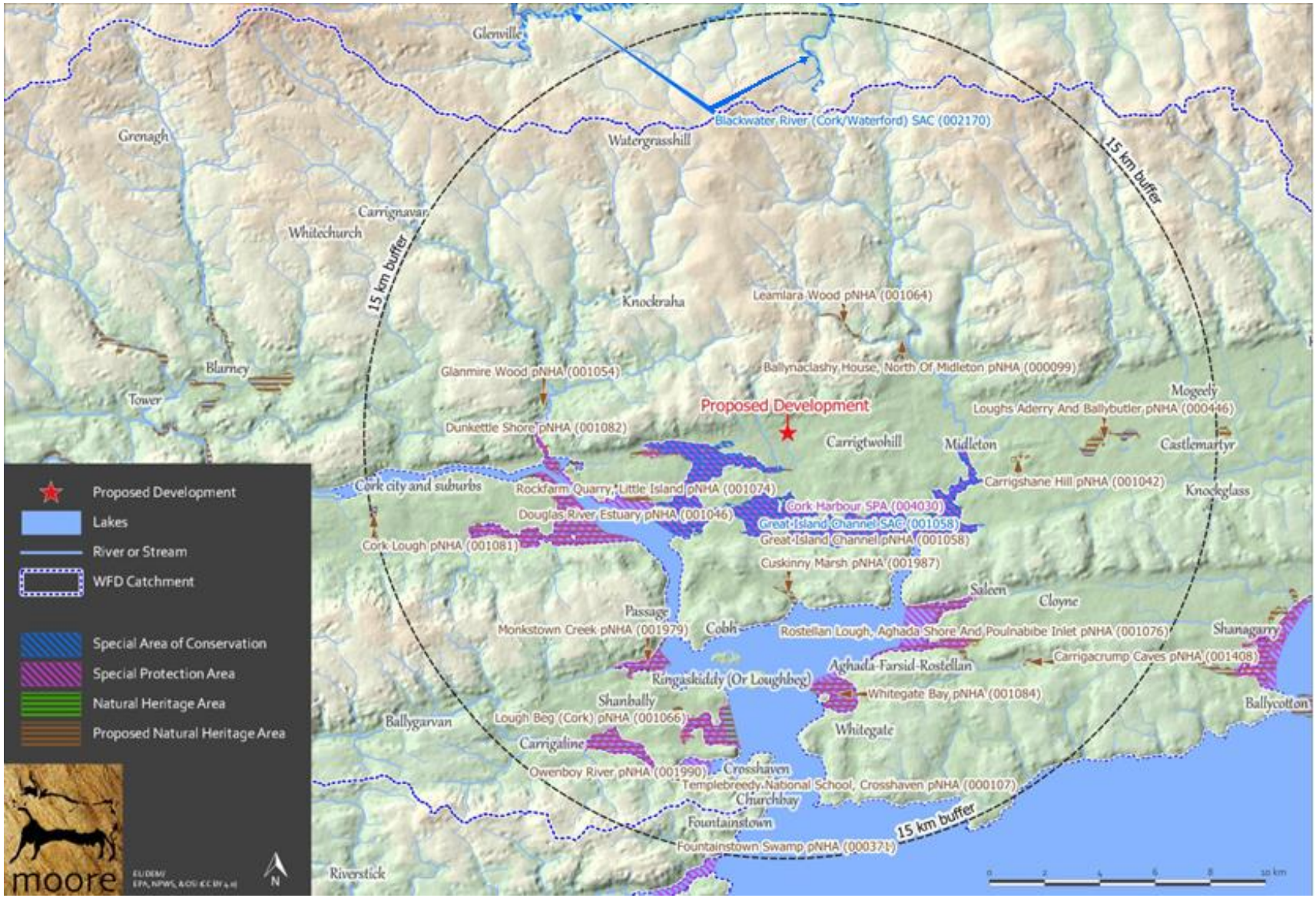


Figure 4. Showing European sites and NHAs/pNHAs within the wider Potential Zone of Influence of the Proposed Development.

Figure 5. Detailed view of European sites in the nearer Potential Zone of Influence of the Proposed Development.

3. Stage 2 – Appropriate Assessment

This stage considers whether the Proposed Development, alone or in combination with other projects or plans, will have adverse effects on the integrity of a European site, and includes any mitigation measures necessary to avoid, reduce or offset negative effects. The Stage 2 Appropriate Assessment comprises a scientific examination of the plan / project and the relevant European site; to identify and characterise any possible implications for the site in view of the site's conservation objectives, structure and function; taking account of in combination effects.

3.1. Description of European Sites Potentially Affected

Potential effects on the following European site have been identified**:**

3.1.1. Great Island Channel SAC [002162]

The NPWS provides the following Site Synopsis in relation to the 3.1.1. Great Island Channel SAC (Version date 24.09.2013, 001058_Rev13.Docx):

The Great Island Channel stretches from Little Island to Midleton, with its southern boundary being formed by Great Island. It is an integral part of Cork Harbour which contains several other sites of conservation interest. Geologically, Cork Harbour consists of two large areas of open water in a limestone basin, separated from each other and the open sea by ridges of Old Red Sandstone. Within this system, Great Island Channel forms the eastern stretch of the river basin and compared to the rest of Cork Harbour, is relatively undisturbed. Within the site is the estuary of the Owennacurra and Dungourney Rivers. These rivers, which flow through Midleton, provide the main source of freshwater to the North Channel.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes):

[1140] Tidal Mudflats and Sandflats
[1330] Atlantic Salt Meadows

The main habitats of conservation interest in Great Island Channel SAC are the sheltered tidal sand and mudflats and the Atlantic salt meadows. Owing to the sheltered conditions, the intertidal flats are composed mainly of soft muds. These muds support a range of macro-invertebrates, notably *Macoma balthica*, *Scrobicularia plana*, *Hydrobia ulvae*, *Nepthys hombergi, Nereis diversicolor* and *Corophium volutator*. Green algal species occur on the flats, especially *Ulva lactuca* and *Enteromorpha* spp.

Cordgrass (*Spartina* spp.) has colonised the intertidal flats in places, especially at Rossleague and Belvelly.

The saltmarshes are scattered through the site and are all of the estuarine type on mud substrate. Species present include Sea Purslane (*Halimione portulacoides*), Sea Aster (*Aster tripolium*), Thrift (*Armeria maritima*), Common Saltmarsh-grass (*Puccinellia maritima*), Sea Plantain (*Plantago maritima*), Greater Sea-spurrey (*Spergularia media*), Lax-flowered Sea-lavender (*Limonium humile*), Sea Arrowgrass (*Triglochin maritimum*), Sea Mayweed (*Matricaria maritima*) and Red Fescue (*Festuca rubra*).

The site is extremely important for wintering waterfowl and is considered to contain three of the top five areas within Cork Harbour, namely North Channel, Harper's Island and Belvelly-Marino Point. Shelduck is the most frequent duck species with 800-1,000 birds centred on the Fota/Marino Point area. There are also large flocks of Teal and Wigeon, especially at the eastern end. Waders occur in the greatest density north of Rosslare, with Dunlin, Godwit, Curlew and Golden Plover the commonest species. A population of about 80 Grey Plover is a notable feature of the area. All the mudflats support feeding birds; the main roost sites are at Weir Island and Brown Island, and to the north of Fota at Killacloyne and Harper's Island. Ahanesk supports a roost also but is subject to disturbance. The numbers of Grey Plover and Shelduck, as given above, are of national importance.

The site is an integral part of Cork Harbour which is a wetland of international importance for the birds it supports. Overall, Cork Harbour regularly holds over 20,000 waterfowl and contains internationally important numbers of Black-tailed Godwit (1,181) and Redshank (1,896), along with nationally important numbers of nineteen other species. Furthermore, it contains large Dunlin (12,019) and Lapwing (12,528) flocks. All counts are average peaks, 1994/95 – 1996/97. Much of the site falls within Cork Harbour Special Protection Area, an important bird area designated under the E.U. Birds Directive. While the main land use within the site is aquaculture (oyster farming), the greatest threats to its conservation significance come from road works, infilling, sewage outflows and possible marina developments.

The site is of major importance for the two habitats listed on Annex I of the E.U. Habitats Directive, as well as for its important numbers of wintering waders and wildfowl. It also supports a good invertebrate fauna.

3.1.2. Cork Harbour SPA [004030]

The NPWS provides the following Site Synopsis in relation to the Cork Harbour SPA (Version date 21.1.2015):

Cork Harbour is a large, sheltered bay system, with several river estuaries - principally those of the Rivers Lee, Douglas, Owenboy and Owennacurra. The SPA site comprises most of the main intertidal areas of Cork Harbour, including all of the North Channel, the Douglas River Estuary, inner Lough Mahon, Monkstown Creek, Lough Beg, the Owenboy River Estuary, Whitegate Bay, Ringabella Creek and the Rostellan and Poulnabibe inlets.

Owing to the sheltered conditions, the intertidal flats are often muddy in character. These muds support a range of macro-invertebrates, notably *Macoma balthica*, *Scrobicularia plana*, *Hydrobia ulvae*, *Nepthys hombergi, Nereis diversicolor* and *Corophium volutator*. Green algae species occur on the flats, especially *Ulva* spp. Cordgrass (*Spartina* spp.) has colonised the intertidal flats in places, especially where good shelter exists, such as at Rossleague and Belvelly in the North Channel. Salt marshes are scattered through the site and these provide high tide roosts for the birds. Some shallow bay water is included in the site. Rostellan Lake is a small brackish lake that is used by swans throughout the winter. The site also includes some marginal wet grassland areas used by feeding and roosting birds.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Little Grebe, Great Crested Grebe, Cormorant, Grey Heron, Shelduck, Wigeon, Teal, Mallard, Pintail, Shoveler, Red-breasted Merganser, Oystercatcher, Golden Plover, Grey Plover, Lapwing, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Greenshank, Black-headed Gull, Common Gull, Lesser Black-backed Gull and Common Tern. The site is also of special conservation interest for holding an assemblage of over 20,000 wintering waterbirds. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

Cork Harbour is an internationally important wetland site, regularly supporting in excess of 20,000 wintering waterfowl. Of particular note is that the site supports internationally important populations of Black-tailed Godwit (1,896) and Redshank (2,149) - all figures given are five year mean peaks for the period 1995/96 to 1999/2000. Nationally important populations of the following 19 species occur: Little Grebe (57), Great Crested Grebe (253), Cormorant (521), Grey Heron (80), Shelduck (2,009), Wigeon (1,791), Teal (1,065), Mallard (513), Pintail (57), Shoveler (103), Red-breasted Merganser (121), Oystercatcher (1,809), Golden Plover (3,342), Grey Plover (95), Lapwing (7,569), Dunlin (9,621), Bar-tailed Godwit (233), Curlew (2,237) and Greenshank (46). The Shelduck population is the largest in the country (over 10% of national total). Other species using the site include Mute Swan (38), Whooper Swan (5), Pochard (72), Gadwall (6), Tufted Duck (64), Goldeneye (21), Coot (53), Ringed Plover (73), Knot (26) and Turnstone (113). Cork Harbour is an important site for gulls in winter and autumn, especially Black-headed Gull (3,640), Common Gull (1,562) and Lesser Black-backed Gull (783), all of which occur in numbers of national importance. Little Egret and Mediterranean Gull, two species which have recently colonised Ireland, also occur at this site.

A range of passage waders occurs regularly in autumn, including such species as Ruff (5-10), Spotted Redshank (1-5) and Green Sandpiper (1-5). Numbers vary between years and usually a few of each of these species over-winter.

Cork Harbour has a nationally important breeding colony of Common Tern (102 pairs in 1995). The birds have nested in Cork Harbour since about 1970, and since 1983 on various artificial structures, notably derelict steel barges and the roof of a Martello Tower. The birds are monitored annually and the chicks are ringed.

Cork Harbour is of major ornithological significance, being of international importance both for the total numbers of wintering birds (i.e. > 20,000) and also for its populations of Black-tailed Godwit and Redshank. In addition, it supports nationally important wintering populations of 22 species, as well as a nationally important breeding colony of Common Tern. Several of the species which occur regularly are listed on Annex I of the E.U. Birds Directive, i.e. Whooper Swan, Little Egret, Golden Plover, Bar-tailed Godwit, Ruff, Mediterranean Gull and Common Tern. The site provides both feeding and roosting sites for the various bird species that use it. Cork Harbour is also a Ramsar Convention site and part of Cork Harbour SPA is a Wildfowl Sanctuary.

3.2. Description of the Existing Environment

3.2.1. Habitats

Habitats within the footprint of the proposed project were surveyed and classified according to Fossitt (2000) by MWP (the site is referred to as the proposed development site or PDS). The proposed development site is comprised of both semi-natural habitats and artificial surfaces. There is potential for these habitats to support nesting birds, and protected mammal species. No protected habitats were recorded during the survey. The habitat map for the site is presented in Figure 6.

Surface drainage from the western part of the proposed development site is to the Anngrove Stream catchment in which the existing Castlelake housing development is located. It is noted that stormwater runoff collected from the existing Castlelake residential development currently discharges to the drainage network as laid for the existing development, and discharges attenuated flows to the Woodstock Stream. It is possible therefore that drainage from the western part of the proposed development site is also via this mechanism. Estuarine habitats connected to drainage from the proposed development site are therefore also considered

Buildings and Artificial Surfaces (BL3)

Roadways, kerbing, buildings and other infrastructure on site are comprised of artificial, man-made materials.

Immature Woodland x Scrub (WS5 x WS1)

The west and south west of the site is dominated by immature woodland and scrub. The dominant species here is goat willow (*Salix caprea*). Gorse (*Ulex europaeus*) and bramble (*Rubus fruticosus* agg) were also abundant in this area.

Improved Agricultural Grassland (GA1)

The south east of the site is comprised of immature agricultural grassland. This is dominated by perennial rye grass, with abundant white clover, broad-leaved dock (*Rumex obtusifolius*), dandelion (*Taraxacum vulgaria*) and ribwort (*Plantago lanceolata*).

Recolonising Bare Ground (ED2)

There are large areas of disturbed ground throughout the site. Species present include pineappleweed (*Matricaria discoidea*), scarlet pimpernel (*Anagallis arvensis*, hawkweed (*Pilosella officinarum*), dandelion and white clover.

Recolonising Bare Ground x Buildings and Artificial Surfaces x Scrub (ED3 x BL3 x WS1)

An area within the south-west of the site is a matrix of bare ground, limestone rock. This is being recolonised by pineappleweed, scarlet pimpernel, hawkweed (*Pilosella officinarum*), dandelion, white clover, gorse, bramble willow saplings, rosebay willowherb (*Chamaenerion angustifolium*), and annual meadow grass (*Poa annua*).

Recolonising Bare Ground x Buildings and Artificial Surfaces (ED3 x BL3)

The site compound at the south-west is on bear ground and limestone trunking. The bare ground is being recolonised by vegetation including pineappleweed, scarlet pimpernel, hawkweed, dandelion and white clover.

Recolonising Bare Ground x Dry Meadows and Grassy Verges (ED3 x GS2)

At the north-west, a path of cleared ground has been cleared and is being recolonised by species including pineappleweed, scarlet pimpernel, hawkweed, dandelion, white clover and creeping thistle (*Cirsium arvense*).

Scrub (WS1)

There are areas of scrub within the site, dominated by gorse, and bramble immature gorse *Ulex europaeus*, bramble, rosebay willowherb and broad-leaved dock.

Spoil and Bare Ground (ED2)

There are deposits of spoil throughout the site as a result of construction works. These habitats are classified as 'Spoil and Bare Ground'.

Drainage Ditches (FW4)

The linear waterbodies within the PDS are categorised as 'drainage ditches' (FW4). According to Fossitt (2000), this category includes linear water bodies or wet channels that are entirely artificial in origin, and some sections of natural watercourses that have been excavated or modified to enhance drainage and control the flow of water. These waterbodies are of low ecological value to their homogenous character (trapezoidal cross section, few substrate types), level of recent disturbance and degree of siltation. They are unsuitable for salmonids (both trout and salmon) and would not be used by these species for spawning, as a nursery for juvenile fish or as holding areas for adults. Parts of the Woodstock Stream that have been physically altered are classified within this category (See Figure 6). Plants recorded were fool's water cress (*Apium nodiflorum),* floating sweet-grass (*Glyceria fluitans*) and water crowfoot (*Ranunculus* sp.).

Eroding/Upland River (FW1) and Depositing/Lowland River (FW2)

Two streams that border/adjoin the PDS are classified as Lowland/Depositing Rivers (FW2) but also have some Eroding/Upland River (FW1) and drainage ditch characteristics. These are the Anngrove and Woodstock Streams, see Figure 7. The Woodstock Stream is not mapped (registered) by the EPA but is a notable freshwater habitat that drains part of the proposed development site. The Woodstock Stream is fast lowing as it flows south along the eastern boundary of the site but slow upstream of the and slow flowing areas have characteristics of i.e. depositing areas but this could also be attributed to excessive silt in these streams. The Woodstock Stream is physically diverse, with a combination of rock, cobble, gravel and fine substrates as well as various flow features i.e. riffle-glide-pool sequences. This stream could potentially be used by trout for spawning and have adequate cover and flow to sustain juvenile trout.

The entire length of the Anngrove Stream is categorised by the NBDC as a depositing lowland river. This watercourse is shown to run through the Castlelake housing estate to the west of the proposed development site so has been re-routed and / or culverted / or has been replaced by surface drainage associated with the housing development.

There is no WFD monitoring data for any of the linear waterbodies on or leaving the site.

Other artificial lakes and ponds (FL8)

The pond south of the existing Castlelake housing development is an artificial pond. It was constructed presumably as an amenity as part of the Castlelake housing development and also serves to attenuate surface water runoff from the housing development. The pond has an overflow into the Woodstock Stream. This pond supports pondweed *Elodea* sp., and curly waterweed (*Lagarosiphon major*), both highly invasive species that are problematic in that they outcompete other plants by shading. Other plants that occurred in Castlelake were yellow flag, water mint (*Mentha aquatica*), great pond sedge (*Carex riparia*), yellow water-lily (*Nuphar lutea*) and variegated reed sweet grass (*Glyceria maxima variegate*). The bed of the lake was anoxic near the surface due a layer of silt.

Lagoons (CW1)

The Anngrove Stream discharges to part of the Cork Harbour transitional waterbody known as Slatty Pond. This waterbody is a transitional lagoon, classified as oligo or polyhaline, mesotidal and sheltered. It is bordered to the west by regional road R624 (Slatty Bridge). Based on NBDC mapping which provides Fossitt (2000) habitat coverage south of the proposed development, this waterbody is surrounded by 'upper salt marsh' (CM2) to the north and 'Reed and large sedge swamps' (FS1) to the south. There is no WFD monitoring data for Slatty Pond.

Muddy sand shores (LS3)

West of Slatty Bridge and connected to Slatty Pond is Lough Mahon (Harper's Island), part of Cork Harbour transitional waterbody. This waterbody is classified as meso or polyhaline, strongly mesotidal, and sheltered. Based on NBDC mapping, this habitat is classified as muddy sandy shore. Data from the EPA's Water Framework Directive (WFD) monitoring describes Lough Mahon as having 'moderate' water quality (2013-2018). The EPA has classed the risk of Lough Mahon (Harpers Island) of failing to meet its WFD objectives as 'At risk'.

Lower Salt Marsh CM1

This habitat occurs at Lough Mahon Lough Mahon (Harper's Island), at various locations along the shores between the upper limits of the neap and spring tides.

Invasive plants

The following Third Schedule invasive species was recorded during the ecological survey within the proposed development site boundary:

- Himalayan balsam (*Impatiens glandulifera*)

Himalayan balsam is present extensively within the proposed development site boundaries. Japanese Rose (*Rosa rugosa*), which is not a Third Schedule species, was also recorded within the proposed development site boundary.

Though outside of the proposed development site boundary, ecological surveying recorded Pondweed/*Elodea* sp. and Curly waterweed (*Lagorosiphon major*) in Castlelake and in the Anngrove Stream. It is considered that these plants occur throughout Castlelake and throughout the Anngrove Stream downstream of Castlelake.

An invasive species management plan (ISMP) has been prepared to manage, treat and prevent the spread of invasive species found within the proposed development area.

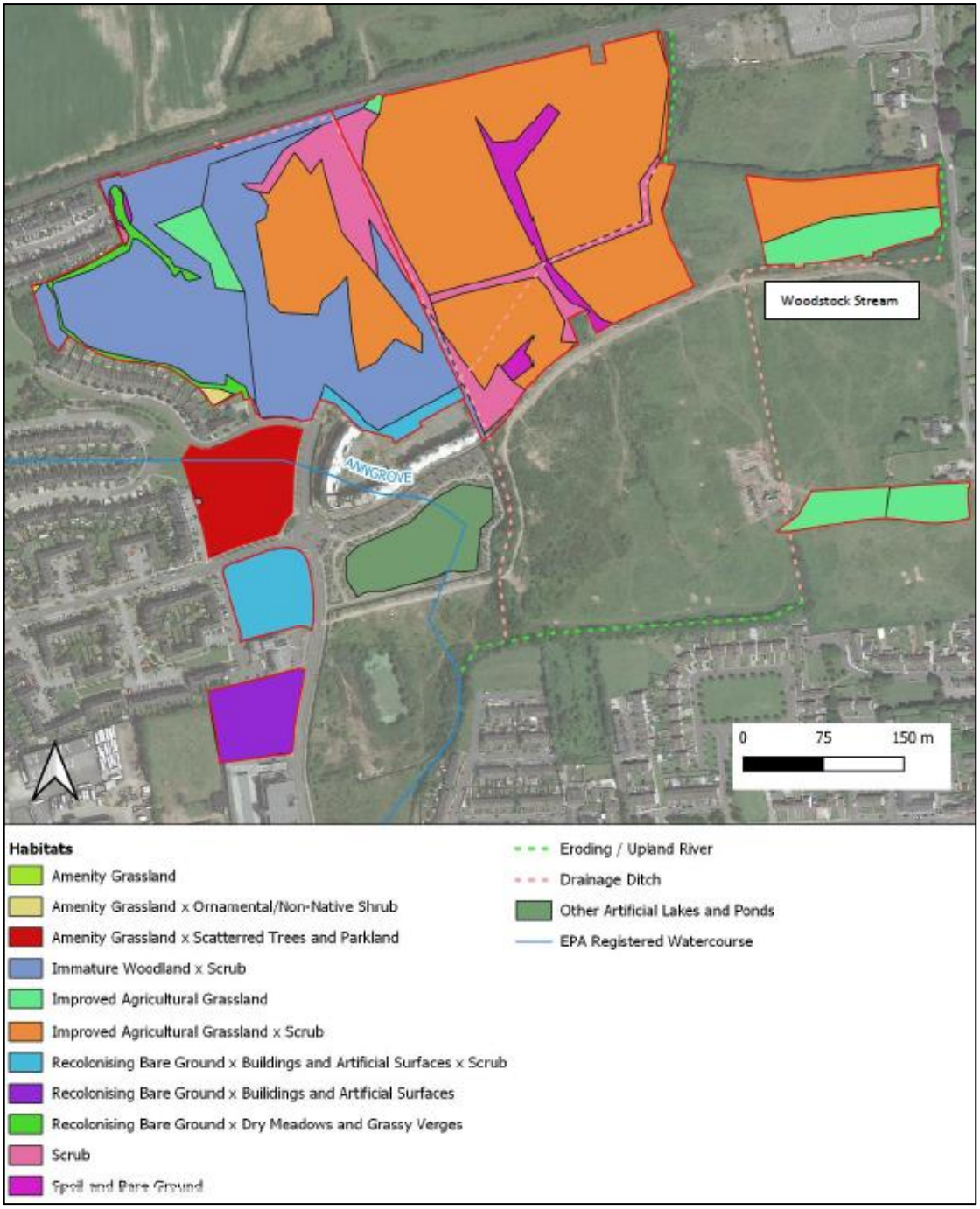


Figure 6. Habitat Map. (Adapted from MPW EIAR)

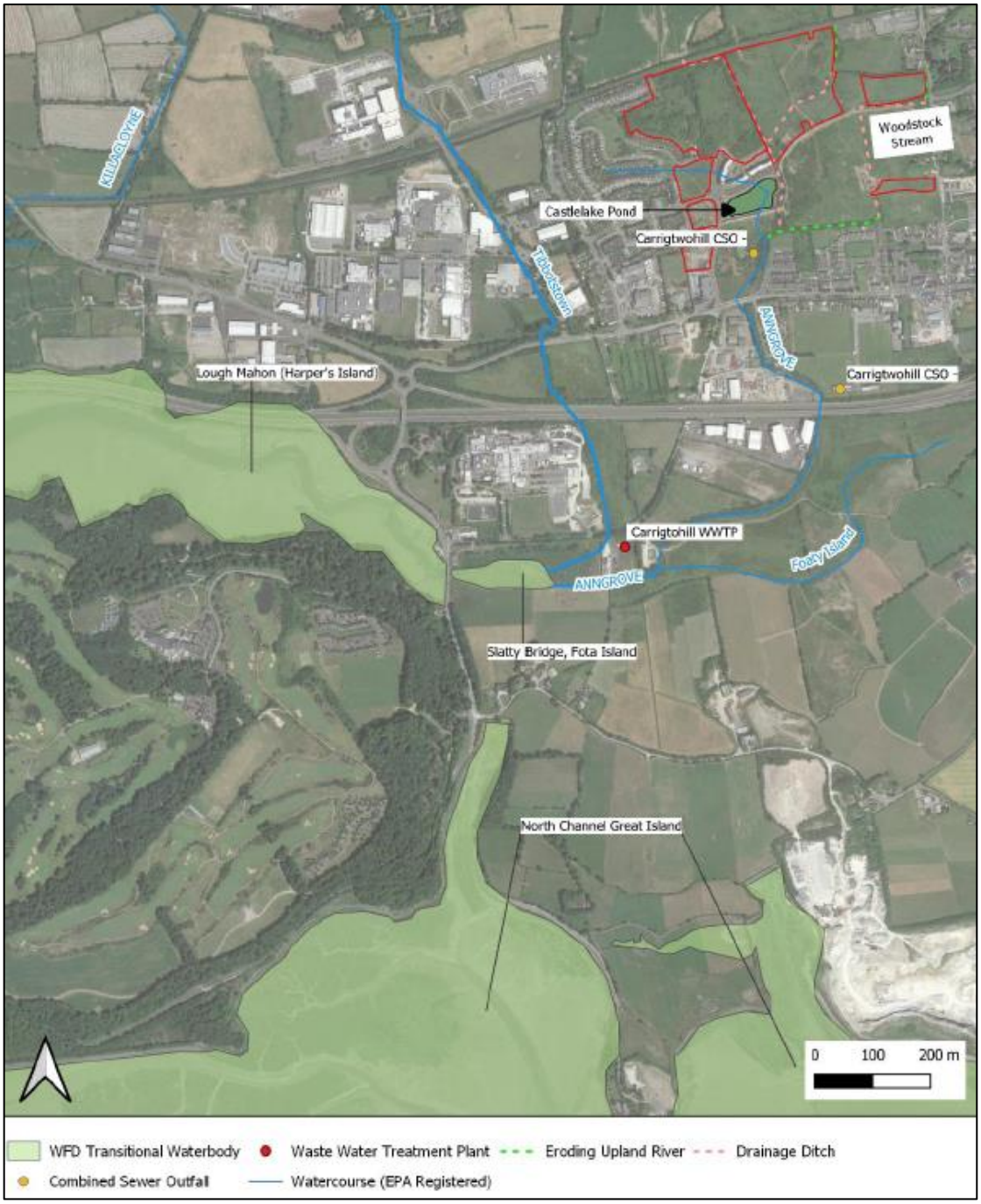


Figure 7. Water feature Map. (Adapted from MPW EIAR)

3.2.2. Fauna

The entire study area was surveyed for mammals or signs indicating their use of the site. No observations or signs of protected mammal species were observed. Rabbit is common at the site, utilising scrub and earth banks for burrows. Badger was detected at the north-eastern boundary of the site. This badger only showed within a two-hour period on one night over an 8-day period. It is considered that this badger was foraging but no snuffles holes were detected in the area. There were

no setts detected within the proposed development site. It is possible that hare occurs at the site but was not recorded during the current surveys. The trailcam footage indicated that the non-volant mammal activity at the site is mostly rabbits and rodents.

Very low levels of bat activity were recorded at the site, with just two soprano pipistrelles recorded commuting along the northern boundary of the site. This can be explained by the industrial nature of the site and level of artificial lighting present at night-time.

3.2.3. Avifauna

A total of thirty-three species were recorded along or in flight over the survey transect routes. Just one of these, Blackbird (*Turdus merula*), was classified as confirmed breeding, on the basis of finding recent eggshells. Six species were classified as probable breeders. The remainder of the records were classified as possible or non-breeding species, twenty-two and four, respectively. Seven species recorded using the site (not including overflying species, which were classified as non-breeding) are considered to be of conservation concern in Ireland according to the current BoCCI red and amber lists (Gilbert & Lewis, 2021). Of these, five were classified as possible breeders and two as probable breeders. Of the two red list species observed, one was recorded as a probable breeder, meadow pipit (*Anthus pratensis*) and one as a possible breeder, snipe (*Gallinago gallinago*). One species listed in Annex 1 of the Birds Directive was recorded in this survey, Little Egret (*Egretta garzetta*), though this species was non-breeding on site and recorded overflying it. A snipe was flushed near the Woodstock Stream southeast of, and adjacent to Castlelake on 30th March by a Malachy Walsh and Partners staff ecologist. This bird was in rough wetter type grassland in area outside of the proposed development site.

One species of conservation interest (SCI) for Cork Harbour SPA was recorded adjacent to the proposed development (but outside the red-line boundary) - grey heron (*Ardea cinerea*). This species was recorded by trailcam on the Woodstock Stream, as well as being noted during August 2021 ecological field surveying using the island at Castlelake as a day roost.

There is potential for construction noise to cause disturbance and/or displacement to nesting grey heron/little egret. However, the receiving environment is adjacent to an urban setting and is already subject to ongoing construction of similar developments nearby. As such, a significant impact on these species by virtue of disturbance/displacement is not considered likely.

3.3. Conservation Objectives of European Sites

3.3.1. Great Island Channel SAC [001058]

Specific Conservation Objectives and Target Notes are set by the NPWS (Version 1. 06 June 2014) for the Great Island Channel (001058) as follows.

1140 Mudflats and sandflats not covered by seawater at low tide

To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in Great Island Channel SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes.
Community distribution	Hectares	Conserve the following community type in a natural condition: Mixed sediment to sandy mud with polychaetes and oligochaetes community complex.

1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)

To restore the favourable conservation condition of Atlantic salt meadows (*Glauco Puccinellietalia maritimae*) in Great Island Channel SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-sites mapped: Bawnard - 0.29ha; Carrigatohil - 1.01ha.
Habitat distribution	Occurrence	No decline or change in habitat distribution, subject to natural processes.
Physical structure: sediment supply	Presence/ absence of physical barriers	Maintain/restore natural circulation of sediments and organic matter, without any physical obstructions
Physical structure: creeks and pans	Occurrence	Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime

Attribute	Measure	Target
Vegetation structure: zonation	Occurrence	Maintain range of coastal habitats including transitional zones, subject to natural processes including erosion and succession
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward
Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of area outside creeks vegetated
Vegetation composition: typical species and sub-communities	Percentage cover at a representative sample of monitoring stops	Maintain range of subcommunities with typical species listed in SMP (McCorry and Ryle, 2009)
Vegetation structure: negative indicator species - *Spartina anglica*	Hectares	No significant expansion of common cordgrass (*Spartina anglica*), with an annual spread of less than 1% where it is already known to occur

3.3.2. Cork Harbour SPA [004030]

Conservation Objectives and Target Notes are set by the NPWS (Generic Version 1. 16 Dec 2014) for the Cork Harbour SPA (004030) as follows.

Generic Conservation Objectives

To maintain the favourable conservation condition of [bird species listed] in Cork Harbour SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target
Population trend	Percentage change	Long term population trend stable or increasing
Distribution	Range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use

	of areas by **[Qualifying Bird Species]**, other than that occurring from natural patterns of variation

Specific Conservation Objectives

A193 Common Tern *Sterna hirundo*

To maintain the favourable conservation condition of Common Tern in Cork Harbour SPA, which is defined by the following list of attributes and targets:

Attribute	Measure	Target
Breeding population abundance: apparently occupied nests (AONs)	Number	No significant decline
Productivity rate: fledged young per breeding pair	Mean number	No significant decline
Distribution: breeding colonies	Number; location; area (hectares)	No significant decline
Prey biomass available	Kilogrammes	No significant decline
Barriers to connectivity	Number; location; shape; area (hectares)	No significant decline
Disturbance at the breeding site	Level of impact	Human activities should occur at levels that do not adversely affect the breeding common tern population

A99 Wetlands

To maintain the favourable conservation condition of the wetland habitat in Cork Harbour SPA as a resource for the regularly-occurring migratory waterbirds that utilise it. This is defined by the following attribute and target:

Attribute	Measure	Target
Habitat area	Hectares	The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 2,587 hectares, other than that occurring from natural patterns of variation

3.4. Consideration of Effects on European Sites

3.4.1. Annex I Habitats Directive Habitats

There are no Annex I habitats located under the footprint or in the vicinity of the adjacent Special Area of Conservation. There will be no direct effects on the Great Island Channel SAC and there will be no habitat loss or fragmentation as a result of the proposed development. Having considered direct effects and ruling them out, indirect effects are then considered in terms of source pathway vectors.

Potential effects on the Great Island Channel SAC are considered in terms of hydrological connectivity between the Proposed Development and Slatty Pond and Slatty Water further downstream.

There will be some disturbance due to groundworks during the construction phase and there is some potential for elevated suspended solids to enter the Anngrove Stream. The predicted impact is likely to be of a moderate to low magnitude. However, as a precaution a Construction Environmental & Waste Management Plan will be completed by the main Contractor or representative which will include details of avoidance measures and silt screening.

It is unlikely that there would be a pollution event from fuel or chemical spillage. However, such an event could significantly affect the trophic status of the Great Island Channel, which would also be contrary to the conservation objectives of the Great Island Channel SAC in terms of potential significant effects on the saltmarsh habitats for which the SAC is designated.

3.4.2. Annex I Birds Directive Birds

A worst-case scenario may be considered whereby the Project may result in a significant detrimental change in water quality in Cork Harbour either alone or in combination with other projects or plans as a result of indirect pollution. The effect would have to be considered in terms of changes in water quality which would affect the habitats or food sources for which the Cork Harbour SPA bird species are designated.

There will be some disturbance due to groundworks during the construction phase and there is some potential for elevated suspended solids to enter the local stream. The predicted impact is likely to be of a moderate to low magnitude. However, as a precaution a Construction Environmental & Waste Management Plan will be completed by the main Contractor or representative which will include details of silt screening.

It is unlikely that there would be a pollution event from fuel or chemical spillage. However, such an event could significantly affect the trophic status of the waters of Cork Harbour, which would also be contrary to the conservation objectives of the Cork Harbour SPA in terms of potential significant effects on the mudflat habitats on which the bird species for which the SAC is designated rely upon.

Any uncontrolled discharge of contaminated surface water to Slatty Pond and Lough Mahon during the construction phase could have a ***short term slight negative effect*** in the absence of mitigation.

The species of conservation interest (SCI) for which Cork Harbour SPA is designated are primarily estuarine in nature, relying on coastal habitats. While some species, particularly gulls, may occasionally use these habitats for foraging, they are of low ecological value to the SCI. One species of conservation interest (SCI) for Cork Harbour SPA was recorded adjacent to the proposed development (but outside the red-line boundary). Grey heron was recorded roosting on the island within Castlelake as well as being noted by trail camera on the Woodstock Stream. These habitats have potential to be used by nesting grey heron and little egret (Annex I species). There is potential for construction noise to cause disturbance and/or displacement to nesting grey heron/little egret. However, the receiving environment is adjacent to an urban setting and is already subject to ongoing construction of similar developments nearby. As such, a significant impact on these species by virtue of disturbance/displacement is not considered likely.

3.4.3. Ecological Network Supporting Natura 2000 Sites

A concurrent GIS analysis of the proposed Natural Heritage Areas (pNHA) and designated Natural Heritage Areas (NHA) in terms of their role in supporting the species using Natura 2000 sites was undertaken along with GIS investigation of European sites. It was assumed that these supporting roles mainly related to mobile fauna such as mammals and birds which may use pNHAs and NHAs as "stepping stones" between Natura 2000 sites.

Article 10 of the Habitats Directive and the Habitats Regulations 2011 place a high degree of importance on such non-Natura 2000 areas as features that connect the Natura 2000 network. Features such as ponds, woodlands and important hedgerows were taken into account during the preparation of the AA Screening report and Natura Impact Statement for the proposed development project.

The NHAs and pNHAs identified in Figure 4 are either located outside the Zone of Influence with the exception of those associated with Cork Harbour. The nationally designated Cork Harbour sites are considered under the higher conservation status as European sites.

3.5. Effects on the Qualifying Interests of European Sites

3.5.1. Direct Effects

Consideration of effects on Habitats

There will be no direct effects on the habitats of the Great Island Channel SAC or on the Cork Harbour SPA as a result of the implementation of the Proposed Development. Direct impact refers to physical effects defined in the Departmental Guidance as 'Loss of habitat area' and/or 'Habitat Fragmentation'. There are no direct effects identified which may affect the Annexed habitats of the SAC or SPA. The Proposed Development will have **no effects** upon the integrity or the site structure of the Great Island Channel SAC or the Cork Harbour SPA.

Consideration of effects on Winter Birds

The majority of the Winter birds within the SPA are concentrated in Slatty Pond at nearest c. 1.2 km to the southwest of the proposed development site. This area is situated approximately 500m southwest of the N25. Thus there is a high volume of vehicular traffic between the proposed development site and Slatty Pond.

It is unlikely that there would be any effect from disturbance from construction or disturbance to birds overwintering in Slatty Pond.

There is potential for construction noise to cause disturbance and/or displacement to nesting grey heron/little egret. However, the receiving environment is adjacent to an urban setting and is already subject to ongoing construction of similar developments nearby. As such, a significant impact on these species by virtue of disturbance/displacement is not considered likely.

3.5.2. Indirect Effects

The potential for impact is considered whereby the Project would result in a significant detrimental change in water quality either alone or in combination with other projects or plans as a result of indirect pollution of surface water. The effect would have to be considered in terms of changes in water quality which would affect the habitats or species for which the Great Island Channel SAC or the Cork Harbour SPA are designated.

Consideration of effects on Surface Water

The likelihood of effects on hydrologically connected environmental sites is low and will be avoided by best practice construction management.

Accidental spillages and contaminated runoff and will be avoided by construction management measures which will be set out in a Construction Environmental Management Plan (CEMP). Management measures will include appropriate site-specific measures from the CIRIA Report C532 Control of Water Pollution from Construction Sites.

The CEMP will include a reference to this NIS for the Project which establishes the connectivity of the site to Cork Harbour and the requirement for avoidance in terms of potential indirect construction activity.

3.6. Mitigation Measures

Although temporary, it is considered that the release of construction pollutants to the Anngrove Stream could result in effects to Slatty Pond and to Cork Harbour to invertebrate communities within mudflat or on saltmarsh habitats. This could have knock-on effects to birds which rely on these habitats for food sources.

The project proponent or Contractor as representative will secure the services of a suitably qualified Ecologist to act as an Ecological Clerk of Works (ECoW) to record the efficacy of water quality protection measures and measures to avoid noise disturbance to wintering birds set out in the following sections.

The following mitigation measures are included in a site-specific CEMP which will be completed by the Project Contractor.

Management of Water Quality

A Management Plan has been developed for the project to ensure that the construction works will not deteriorate the water quality and will safeguard existing water. The key to avoid impacts to water during the construction works is good site management practices, tight controls, regular inspections and ongoing vigilance with staff and employees on site.

Construction best practice measures (of relevance in respect of any potential ecological impacts) will be implemented throughout the project, including the preparation and implementation of detailed method statements. The works will incorporate the relevant elements of the guidelines outlined below:

- IFI (2016) *Guidelines on protection of fisheries during construction Works in and adjacent to waters* (IFI, 2016).
- Masters-Williams *et al.* (2001) *Control of water pollution from construction sites. Guidance for consultants and contractors (C532).* CIRIA.
- E. Murnane, A. Heap and A. Swain. (2006) *Control of water pollution from linear construction projects. Technical guidance (C648). CIRIA.*
- E. Murnane et al., (2006) *Control of water pollution from linear construction projects. Site guide (C649). CIRIA.*

In addition, the following construction surface water management measures will be implemented and monitored for the duration of the works. The potential for the construction works to have an impact on the quality of the local watercourses will be minimised through the implementation of the following control measures as outlined in the CEMP:

Contact will be maintained with the relevant authority such as the Inland Fisheries Ireland when required.

- Special attention will be paid to minimising the opportunities for wash-off of inert solids (usually from exposed soil mounds, embankments or excavated trenches etc.) from entering watercourses. Silt traps will be used where necessary around the open steams and watercourses.
- A sedimat will be utilised for the protection of streams from sedimentation damage during in stream construction activities for the installation of culverts,
- Care will be taken to avoid interference with the supply or quality of any groundwater resource.
- Waste products associated with the works will not be permitted to enter watercourses adjacent to the works through the use of French drains, petrol interceptors or other agreed methods.
- Water that is high in solids or contaminated with cement or oil, will not be pumped from excavations directly to watercourses without pre-treatment (e.g. sedimentation/ filtration and oil separation).
- All site run-off associated with the construction will be directed to storm control areas or tanks to prevent direct discharge into water courses.
- All operational machinery used in-stream will be kept to an absolute minimum.
- Spill kits will be provided at all river locations identified.
- Fuels, oils, greases and hydraulic fluids will be stored in bunded compounds well away from watercourses. Refueling of machinery, etc. must be carried out in bunded areas. Fuels will be stored during the construction phase in bunded fuel storage tanks with a 110% holding

capacity. Where it is necessary to dispense fuels on site, this will be undertaken in areas covered with an impermeable surface to protect surface water and ground water;

- Construction works, especially ones involving the pouring of concrete, will be conducted in the dry. Precast concrete will be used in preference to uncured concrete, which kills aquatic fauna through alteration of stream pH. When cast-in-place concrete is required, all work will be done in the dry and allowed cure for 48 hours before re-flooding.
- To help prevent the contamination of the ground and groundwater, contaminated materials (oils, fuels, chemicals etc.) will be used and stored in an appropriate manner as outlined in the relevant guidance, i.e. CIRIA (2001) and DMRB Volume 11 (1994).

Should any monitoring or inspection indicate that pollution of the Castlelake Roads Infrastructure or adjacent watercourses has occurred then the Site Management Team will immediately inspect all work activities to ascertain whether they are operating effectively. All works may be stopped and/or additional control measures installed to prevent further pollution or discharge to the watercourse. Appropriate action will be taken in consultation with the Site Agent. Water samples will be taken at the watercourse if required.

Silt Fencing

As an additional measure where the construction works are adjacent to a water course silt fencing will be installed. The purpose of the silt fence is to retain any soil and silt disturbed during construction and prevent it from entering into watercourses.

Inspection and Maintenance

The construction drainage system for the proposed development must be managed and monitored at all times and particularly after heavy rainfall events during the construction phase. The construction drainage system will be regularly inspected and maintained to ensure that any failures are quickly identified and repaired so as to limit/prevent water pollution.

Management of Concrete

To reduce the potential for cementitious material entering surface waters, concrete pours will be supervised by the Construction Manager, a suitably qualified Engineer and the Environmental Manager. 22461 Castlelake Strategic Housing Development EIAR 61 May 2022

Management Measures will include the following:

- The Construction Manager will ensure that the area of the pour is completely drained of water before a pour commences.
- Pours will not take place during forecasted heavy rainfall;
- Incidental rainfall from light showers during the period of a pour is typically absorbed into the concrete matrix but heavier showers can result in some run off from the top surface of the concrete pour. If run-off is encountered the Environmental Manager will block the outflow from the drains to retain or treat the run-off until the pH is neutral before discharge to the drainage network;
- In the event of a spillage on site, the Environmental Manager will temporarily block the dirty water drains in the immediate area and monitor the pH levels of the water in the open drainage channel and if necessary, will adjust the pH levels using CO2 entrainment. Any spillage will be cleared immediately and deposited in the Chute wash down area;
- To reduce the volume of cementitious water, washout of concrete trucks will not take place on site. Concrete trucks will be washed out off site at the source quarry. Only Concrete truck chutes will be allowed to be cleaned on site at a central concrete wash out area.

Fuel and Oils Management

Fuel Management Measures that will be employed during the Construction phase include:

- The potential for hydrocarbons getting into the existing drains and Lough Mahon will be mitigated by only refuelling construction machinery and vehicles in designated refuelling areas using a prescribed re-fuelling procedure;
- Refuelling will be carried out using 110% capacity double bunded mobile bowsers. The refuelling bowser will be operated by trained personnel. The bowser will have spill containment equipment which the operators will be fully trained in using;
- To reduce the potential for oil leaks, only mechanically sound vehicles and machinery will be allowed onto the site. An up to date service record will be required from the main contractor;
- Mobile bowsers, tanks and drums should be stored in secure, impermeable storage area, away from drains and open water.
- Collision with oil stores will be prevented by locating oils within a steel container in a designated area of the site compound away from vehicle movements.
- Potential leaks from delivery vehicles will be reduced by visually inspecting all delivery vehicles for major leaks. Contractors supplying concrete and crushed stone to the site will be contractually required to supply their products using roadworthy vehicles;
- Should there be an oil leak or spill, the leak or spill will be contained immediately using oil spill kits. This contaminated material will be properly disposed of in a licensed waste facility;

- The Environmental Manager will be immediately informed of the oil leak/spill and will assess the cause and the management of the clean-up of the leak or spill. They will inspect nearby drains for the presence of oil, and initiate the clean-up if necessary;
- Immediate action will be facilitated by easy access to oil spill kits. An oil spill kit that includes absorbing pads and socks will be kept at the site compound and also in site vehicles and machinery;
- Corrective action in the event of a leak or spill will be facilitated by training all vehicle/machinery operators in the use of the spill kits and the correct containment and cleaning up of oil spills or leaks. This training will be provided by the Environmental Manager at site induction;
- In the event of a major oil spill, a company who provide a rapid response emergency service for major fuel spills will be immediately called for assistance, their contact details will be kept in the site office and in the spill kits kept in site vehicles and machinery.
- Long term storage of waste oils will not be allowed on site. These waste oils will be collected in leak-proof containers and removed from the site for disposal or re-cycling by an approved service provider.

Stream Enhancement Works

Some reaches of the Woodstock Stream within the study area have been modified in the past and/or degraded due to adjacent land practices and/or re-sectioning (straightened and realigned). The physical character of the Woodstock Stream will be diversified by using guidance in '*Channels and Challenges - the Enhancement of Salmonid Rivers* (O'Grady, 2006) as well as O'Grady *et al*, (2017). This will increase the quality and quantity of salmonid spawning, nursery and holding habitat. This will offset past degradation and compensate for any impacts that may occur during construction stage on these reaches of the Woodstock Stream.

The following is proposed regarding enhancement of the Woodstock Stream:

- Instream enhancement and riparian enhancement;
- Removal of most of concrete rubble. Some can be used in conjunction with imported gravel to create instream features;
- Creation of riffle, glide1 and pool sequences along both reaches by installation of rock pools. This Installing a series of stone weirs (notched and vortex) at gradient breaks and higher gradient stretches along the channel. Weir construction would be at least seven channel widths in distance apart;
- Introduction of instream random boulders;
- The works will commence at the top of the reach and progress downstream;

- The works would be undertaken outside the salmonid spawning season, so would have to be carried out between June (or July) – September inclusive; and
- Riparian enhancement will involve the sporadic planting of native trees and shrubs.

These works would be overseen by the ECoW who will be familiar with rivers work and have a good knowledge of salmonid habitat requirements. To this end, the ECoW will have a general knowledge of content outlined in publications such as '*Ecology of the Atlantic Salmon*' (Hendry and Cragg-Hine, 2003) and '*Trout and Salmon - Ecology, Conservation and Rehabilitation*' (Crisp, 2000). Duties will include the delivery of toolbox talks and monitoring of construction phase to ensure all environmental controls with reference to IFI (2016) are implemented in full. The ECoW would consult/liaise with the IFI during the works.

Under the Fisheries (Consolidation) Act, 1959, and as revised (2010), it is an offence to disturb the bed of a river; therefore it will be necessary to get written permission from Inland Fisheries Ireland to proceed with the works in any areas where disturbance to the spawning and nursery areas of salmonids will occur as a result of the proposed development.

The final CEMP will be held on site by the site director/foreman for inspection as required by the Local Authority or a representative thereof.

3.7. Assessment of In-Combination Effects

As part of the preparation of this NIS, other relevant projects and plans in the Zone of Influence must also be considered. This step aims to identify at this early stage any possible significant in-combination or cumulative effects / effects of the proposed development with other such plans and projects on the Natura 2000 site.

Assessment of Plans

The planning authority in whose functional area the development is proposed is Cork County Council. There is potential for "in-combination" effects on water quality in Cork Harbour from other plans and projects carried out within the functional areas of the Cork County Development Plan 2022-2028 (Cork County Council, 2022).

Assessment of Projects

A review of the National Planning Application Database was undertaken. The first stage of this review confirmed that there were no data gaps in the area where the proposed Project is located. The database was then queried for relevant developments granted planning permission, or relevant applications with

decisions pending,in the vicinity of the proposed Project within the last three years, these are presented in Table 2.

Table 2. Planning Applications granted permission in the vicinity of the Proposed Development.

Planning Ref.	Description of development	Comments
N/A	Part 8 proposal for Main Street and Station Road Public Realm Works including footpath widening, road re-alignment, resurfacing, signalisation, traffic calming measures, street lighting, demolition of buildings at the junction of Main Street and Station Road along with other small scale demolition works, and provision of new public spaces, upgrade of Wises Road junction, additional capacity measures at N25Junction 3 (Cobh Cross) including widening and realignment of approach roads to the roundabout.	The AA Screening for this project concluded that the works are not anticipated to cause direct, indirect or cumulative impacts to the SAC and SPA. A Construction & Environmental & Management Plan has been developed for the present SHD project which will avoid significant effects.
N/A	Part 8 strategic cycleway scheme proposal extending from Wises Road, north of the Cork to Middleton railway line at the western end of Carrigtwohill to the east of the Carrigane Road bridge at the eastern end of Carrigtwohill. The scheme will pass through the Carrigtwohill UEA, cross Wises Road, Station Road, Leamlara Road and Carrigane Road.	Granted. The AA Screening for this project concluded that the proposed cycleway project, individually or in-combination with other plans and projects, will have likely significant effects on the Great Island Channel SAC and Cork Harbour SPA in view of their conservation objectives. A Construction & Environmental & Management Plan has been developed for the present SHD project which will avoid significant effects.
N/A	Part 8 consent for strategic cycleway scheme connecting Bury's Bridge at Dunkettle with Carrigtwohill. The cycleway enters the west side of Carrigtwohill to the north of Cobh Cross (N25 Junction 3) and runs parallel to Carrigtwohill Main Street before turning north and running along the Castlelake Access Road where it then joins the link roads associated with the new schools campus permitted under 19/5707.	Granted. The AA Screening for the Part 8 project concluded that the inherent policy protections outlined in existing plans, and the predicted effects from relevant projects, together with the statutory requirements to carry out AA, would result in no likely significant effects on Natura 2000 sites within the zone of influence of the proposed development in-combination with other plans and projects. A Construction & Environmental & Management Plan has been developed for the present SHD project which will avoid significant effects.
194770	Use of ground floor retail unit (Unit 1 -112sq.m) permitted under planning permission ref: 06/13582, for medical use (Class 8); Subdivision of ground floor pharmacy unit (Unit 2/3 – c224sq.m) permitted under planning permission ref: 10/4486; use of Unit 2 (112sq.m) as a cafe/bistro; and use of Unit 3 (112sq.m) as a pharmacy and all associated works.	Granted. A Construction & Environmental & Management Plan has been developed for the protection of the adjacent Great Island Channel SAC and Cork Harbour SPA to avoid significant effects from contaminated water for the present SHD project which will avoid in-combination effects.
194889	Development consists of permission for the continuation of use of 4 no. temporary classrooms (previously granted	Granted. A Construction & Environmental & Management Plan is

Planning Ref.	Description of development	Comments
	under Planning Ref: 15/5474) for a further two years, 2.4m high post and mesh fenced enclosure, signage and associated site works and services.	required for the protection of the adjacent Great Island Channel SAC and Cork Harbour SPA to avoid significant effects from contaminated water for the present project which will avoid in-combination effects.
194961	Permission for (1) the construction of a single storey extension (55.25msq) to the rear of the existing building to extend the store room for the shop (2) the relocation of the staff access door to the rear elevation of the building (3) minor alterations to the internal layout of the staff facilities area and (4) all necessary ancillary site works.	Granted. A Construction & Environmental & Management Plan is required for the protection of the adjacent Great Island Channel SAC and Cork Harbour SPA to avoid significant effects from contaminated water for the present SHD project which will avoid in-combination effects.
195707	The demolition of 1 No. derelict two storey dwelling and 1 no. derelict single storey agricultural storage building; the construction of 3 no. new school buildings and the construction of a main link road with a roundabout from Castlelake Housing Estate to Station Road and an additional link from the roundabout to Station Road.	Granted. An NIS was prepared for this adjacent development and Construction Management included to prevent significant effect from surface water runoff to Cork Harbour. The Woodstock Stream was diverted and culverted under strict guidance from IFI and a Report for AA Screening determined that this aspect of the Project did not have a significant effect on the Conservation Objectives of European sites in Cork Harbour. A Construction & Environmental & Management Plan is required for the protection of the adjacent Great Island Channel SAC and Cork Harbour SPA to avoid significant effects from contaminated water for the present project which will avoid in-combination effects.
195836	Internal road upgrades. The proposed development will involve the upgrade of existing internal access roads to provide a dedicated shared use cycleway and footpath, pedestrian and cycle crossing point, bus lane, bus shelter and traffic safety barrier. The proposed development will also include for the provision of a cycleway and footpath adjacent to the L-3616 public road to connect into the L-3615 at the north eastern corner of the IDA Business Park	Granted and constructed.
195877	Construction of an extension to the existing manufacturing facility and all ancillary site works. The proposed development consists of a building ranging in height from 2 to 3 storeys and comprising a new production floor over two levels, administrative offices, canteen, labs, staff wellness centre and locker rooms and makes provision for roof top plant. Ancillary structures and site works including a gas compound, waste compound, powder store, multi store shelter, sprinkler tank, alterations to road layout within the site and staff car parking. Access to the site will be from the existing entrances to the IDA Business Park. A Natura Impact Statement (NIS) has been prepared and will be submitted to the Planning Authority with the application.	Granted. A Construction & Environmental & Management Plan is required for the protection of the adjacent Great Island Channel SAC and Cork Harbour SPA to avoid significant effects from contaminated water for the present SHD project which will avoid in-combination effects.

Planning Ref.	Description of development	Comments
195950	To construct a new temporary gateway, to provide vehicular access to a proposed new community garden on a site immediately to the East of the main access road serving the Ban na Greine housing estate. The proposed gateway will remain in use until the owners of the site, the Commissioners for Public Works, require the community garden site to be returned to them for other purposes	Granted. A Construction & Environmental & Management Plan is required for the protection of the adjacent Great Island Channel SAC and Cork Harbour SPA to avoid significant effects from contaminated water for the present SHD project which will avoid in-combination effects.
204614	To demolish the single storey entrance annex to north elevation, and permission to erect extensions to the building as follows: a) a new 2 storey extension to the north elevation of the building comprising partly of commercial shop/office/surgery space on ground floor and partly community meeting rooms on both floors, b) new single storey main entrance lobby with managers office and link hallway to the western side of the building, c) 2 storey extension to eastern side of large community hall to incorporate community meeting rooms on both floors and to include additional door & window on southern elevation, d) new single storey staff room and toilet attached to eastern side of building, e) new seat/table storage room attached to southern side of building, f) all associated site development works.	Granted. A Construction & Environmental & Management Plan is required for the protection of the adjacent Great Island Channel SAC and Cork Harbour SPA to avoid significant effects from contaminated water for the present SHD project which will avoid in-combination effects.
204715	A 3 year permission for 7 no. temporary classrooms (561msq), comprising of 1 no. block of 7 classrooms (561msq), 2.4m high post and mesh fenced enclosure, associated drainage to include connections to existing on site foul and surface water sewers, proposed signage within the site boundaries, alterations to existing carpark layout & all associated site works and services.	Granted. A Construction & Environmental & Management Plan is required for the protection of the adjacent Great Island Channel SAC and Cork Harbour SPA to avoid significant effects from contaminated water for the present SHD project which will avoid in-combination effects.
204847	To construct 1 no. temporary 80 square metre single-storey portacabin modular classroom unit and all other related ancillary works within school grounds to the east of the existing national school buildings.	Granted. A Construction & Environmental & Management Plan is required for the protection of the adjacent Great Island Channel SAC and Cork Harbour SPA to avoid significant effects from contaminated water for the present SHD project which will avoid in-combination effects.
204848	For use of a single storey classroom, permitted as a temporary building under planning registration no. 17/6292, on a permanent basis.	Granted. A Construction & Environmental & Management Plan is required for the protection of the adjacent Great Island Channel SAC and Cork Harbour SPA to avoid significant effects from contaminated water for the present SHD project which will avoid in-combination effects.
204938	Construction of a new detached 2 storey dwelling, a new vehicular entrance, mains connection and all associated site works.	Granted. A Construction & Environmental & Management Plan is required for the protection of the adjacent Great Island Channel SAC and Cork Harbour SPA to avoid significant effects from contaminated

Planning Ref.	Description of development	Comments
		water for the present SHD project which will avoid in-combination effects.
205073	To construct a new storey and half type dwelling house & domestic garage, demolish existing domestic shed, construct new gated entrance and the existing memorial cross to be moved to the western boundary wall of the proposed site and all associated site works.	Granted. A Construction & Environmental & Management Plan is required for the protection of the adjacent Great Island Channel SAC and Cork Harbour SPA to avoid significant effects from contaminated water for the present SHD project which will avoid in-combination effects.
205248	Permission for retention of 6 no. temporary modular 80m2 classrooms as previously permitted under planning file. Ref. S/07/7653, S/14/4596 and S/15/4537.	Granted. A Construction & Environmental & Management Plan n is required for the protection of the adjacent Great Island Channel SAC and Cork Harbour SPA to avoid significant effects from contaminated water for the present SHD project which will avoid in-combination effects.
205934	To construct single storey extension on to side of existing dwelling and to install a domestic effluent treatment system to replace existing septic tank and soakway together with all associated site development works.	Granted. A Construction & Environmental & Management Plan n is required for the protection of the adjacent Great Island Channel SAC and Cork Harbour SPA to avoid significant effects from contaminated water for the present SHD project which will avoid in-combination effects.
206267	Conversion of existing attic space to comprise a new bedroom with en-suite, construction of a new dormer window to rear, installation of 2 no. rooflights to rear and internal alterations to existing detached dwelling house with all associated site development works and services.	Granted. A Construction & Environmental & Management Plan is required for the protection of the adjacent Great Island Channel SAC and Cork Harbour SPA to avoid significant effects from contaminated water for the present SHD project which will avoid in-combination effects.
214362	To construct a covered patio area and a two storey extension to the rear of existing dwelling house, internal alterations and all associated site works.	Granted. A Construction & Environmental & Management Plan is required for the protection of the adjacent Great Island Channel SAC and Cork Harbour SPA to avoid significant effects from contaminated water for the present SHD project which will avoid in-combination effects.
215211	Permission for retention for a single storey extension to front of existing dwelling and permission to a) convert the existing attic storage space to habitable rooms, b) modify existing roof from 2no. hip roofs to gable roofs on existing dwelling, c) install velux windows to front and rear of existing dwelling, d) install 2No. first floor windows to sides of existing dwelling and ancillary works.	Granted. A Construction & Environmental & Management Plan is required for the protection of the adjacent Great Island Channel SAC and Cork Harbour SPA to avoid significant effects from contaminated water for the present SHD project which will avoid in-combination effects.

Planning Ref.	Description of development	Comments
215348	The continuation of use for 2 No. temporary classrooms, 2.4m high palatine fenced enclosure and all associated site works and services, previously granted under planning ref. No. 19/4452 for a further 3 years.	Granted. A Construction & Environmental & Management Plan is required for the protection of the adjacent Great Island Channel SAC and Cork Harbour SPA to avoid significant effects from contaminated water for the present SHD project which will avoid in-combination effects.
215349	Permission for the continuation of use of 4 no. temporary classrooms, 2.4m high palatine fenced enclosure, signage and associated siteworks (previously granted under planning ref. no. 17/5095) for a further three years.	Granted. A Construction & Environmental & Management Plan is required for the protection of the adjacent Great Island Channel SAC and Cork Harbour SPA to avoid significant effects from contaminated water for the present SHD project which will avoid in-combination effects.
215445	Demolish existing single storey rear extension and construct a new two-storey rear extension, alterations to their existing dwelling house and all associated site works.	Granted. A Construction & Environmental & Management Plan is required for the protection of the adjacent Great Island Channel SAC and Cork Harbour SPA to avoid significant effects from contaminated water for the present SHD project which will avoid in-combination effects.
216355	To construct detached single-storey building for additional, education, training and family support purposes at the rear of the existing premises.	Granted. A Construction & Environmental & Management Plan is required for the protection of the adjacent Great Island Channel SAC and Cork Harbour SPA to avoid significant effects from contaminated water for the present SHD project which will avoid in-combination effects.
217130	The construction of a residential development of 63 no. residential units consisting of 47 no. dwelling houses and 16 no. duplex apartment units and all ancillary site development works.	Granted. A Construction & Environmental & Management Plan is required for the protection of the adjacent Great Island Channel SAC and Cork Harbour SPA to avoid significant effects from contaminated water for the present SHD project which will avoid in-combination effects.
224440	Demolition of existing buildings/structures and construction of mixed-use development comprising of 5 no. buildings comprising 43 no. residential units (14 no. one bed units and 29 no. two bed units) and mixed uses including retail, offices, pharmacy and café.	Decision pending, subject to further information request. A Construction & Environmental & Management Plan is required for the protection of the adjacent Great Island Channel SAC and Cork Harbour SPA to avoid significant effects from contaminated water for the present SHD project which will avoid in-combination effects.

Planning Ref.	Description of development	Comments
224736	Permission to develop a container storage facility with containers varying in sizes from 20 feet to 40 feet in length, container with toilet/ office facilities connected to existing services on site, 3 m high paladin security fencing around perimeter and all associated site works.	Decision pending, subject to further information request. A Construction & Environmental & Management Plan is required for the protection of the adjacent Great Island Channel SAC and Cork Harbour SPA to avoid significant effects from contaminated water for the present SHD project which will avoid in-combination effects.
224839	The demolition of existing switch room and an existing drum store and the construction of a new 3 storey manufacturing building to the east of the existing manufacturing building.	Decision pending, subject to further information request. AA screening report and NIS filed in support of this application. A Construction & Environmental & Management Plan is required for the protection of the adjacent Great Island Channel SAC and Cork Harbour SPA to avoid significant effects from contaminated water for the present SHD project which will avoid in-combination effects.
225005	The construction of 47 no. dwelling houses and all ancillary site works.	Decision pending. A Construction & Environmental & Management Plan is required for the protection of the adjacent Great Island Channel SAC and Cork Harbour SPA to avoid significant effects from contaminated water for the present SHD project which will avoid in-combination effects.

3.7.1. Conclusion of In-combination Effects

The Cork County Development Plan in complying with the requirements of the Habitats Directive requires that all Projects and Plans that could affect the Natura 2000 sites in the same potential Zone of Influence of the Proposed Development site would be initially screened for Appropriate Assessment and if requiring Stage 2 AA, that appropriate employable mitigation measures would be put in place to avoid, reduce or ameliorate negative effects. In this way any, in-combination effects with Plans or Projects for the Proposed Development area and surrounding townlands in which the Proposed Development site is located, would be avoided.

The listed developments have been granted permission in most cases with conditions relating to sustainable development by the consenting authority in compliance with the relevant Local Authority Development Plan and in compliance with the consenting authority requirement with regard to the Habitats Directive. The development cannot have received planning permission without having met

the consenting authority requirement in this regard. Similarly, the applications outlined with decisions pending will be held to all appropriate standards should they be granted planning permission.

Given the inclusion of strict Best Practice Construction Measures to be included and enforced through a Construction & Environmental Management Plan, the proposed development will have no predicted effects on local ecology and biodiversity or on hydrologically linked European sites, therefore in-combination effects can be ruled out.

Any new applications for the Project area will be initially assessed on a case by case basis *initially* by Cork County Council which will determine the requirement for AA Screening as per the requirements of Article 6(3) of the Habitats Directive.

4. Natura Impact Statement & Conclusion

This NIS has reviewed the predicted effects arising from the Project and found that with the implementation of appropriate mitigation measures specifically with regard to surface water, significant effects on the integrity of the Great Island Channel SAC and Cork Harbour SPA can be ruled out.

It is the conclusion of this NIS, on the basis of the best scientific knowledge available, and with the implementation of the mitigation and restriction measures set out under Section 3.6 that the possibility of any adverse effects on the integrity of the European Sites considered in this NIS (having regard to their conservation objectives), or on the integrity of any other European Sites (having regard to their conservation objectives,) arising from the proposed development, either alone or in combination with other plans or projects, can be excluded beyond reasonable scientific doubt.

5. References

Crisp TJ (2000). Trout and Salmon. Ecology, Conservation and Rehabilitation. Blackwell Science, Oxford. 212pp.

Department of the Environment, Heritage and Local Government (2010) Guidance on Appropriate Assessment of plans and projects in Ireland (as amended February 2010).

European Commission (2000) Managing Natura 2000 sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC.

European Commission (2002) Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43EEC. European Commission, Brussels.

European Commission (2007) Guidance document on Article 6(4) of the 'Habitats Directive '92/43/EEC: Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interests, compensatory measures, overall coherence and opinion of the Commission. European Commission, Brussels.

European Commission (2018) Managing Natura 2000 sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC.

European Commission (2021) Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC, Brussels 28.9.21.

European Commission (2021) Guidance document on the strict protection of animal species of Community interest under the Habitats Directive, Brussels 12.10.21.

Gilbert G, Stanbury A and Lewis L (2021), "Birds of Conservation Concern in Ireland 2020 –2026". Irish Birds 9: 523—544.

Hendry K & Cragg-Hine D (2003) Ecology of the Atlantic Salmon. Conserving Natura 2000 Rivers Ecology Series No. 7. English Nature, Peterborough.

IFI (2016) Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters. Inland Fisheries Ireland, 3044 Lake Drive, Citywest Business Campus Co. Dublin. IFI/2016/1-4298.

Masters-Williams, H., Heap, A., Kitts, H., Greenshaw, L., Davis, S., Fisher, P., Hendrie, M., Owens, D. (2001) Control of water pollution from construction sites. Guidance for consultants and contractors. DETR/CIRIA. London.

Murnane, E., Heap, A., Swain A. (2006) Control of water pollution from linear construction projects. Technical guidance (C648). 234pp. CIRIA, UK.

NPWS (2014) Conservation Objectives: Great Island Channel SAC 001058. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2014) Conservation Objectives: Cork Harbour SPA 004030. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2019) The Status of EU Protected Habitats and Species in Ireland. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.

NPWS (2022) National Parks and Wildlife Service Metadata available online at https://www.npws.ie/maps-and-data

O'Grady, M. (2006). *Channels and Challenges. The enhancement of salmonid rivers*. Central Fisheries Board, Dublin. 142pp.

O'Grady, M., Delanty, K., Coghlan, B., O'Briain, R. and Gilligan, N. (2017) River Enhancement Programmes in Ireland. Inland Fisheries Ireland, 3044 Lake Drive, Citywest Business Campus, Dublin 24, Ireland.

Office-of-the-Planning-Regulator (2021) Appropriate Assessment Screening for Development Management OPR Practice Note PN01. March 2021

APPENDIX 1 – AA Screening Report

MWP

Appropriate Assessment Screening Report

Castlelake Strategic Housing Development (SHD)
Carrigtwohill, Co. Cork

BAM Property

May 2022

Contents

Tables

Appendices

Project No.	Doc. No.	Rev.	Date	Prepared By	Checked By	Approved By	Status
22461	22461-6003	P01	26/10/2021	SC	AR	OH	ISSUE
22461	22461-6003	P02	11/05/2022	MS	AR	OH	ISSUE

MWP, Engineering and Environmental Consultants
Address: Park House, Bessboro Road, Blackrock, Cork, T12 X251
www.mwp.ie

1. Introduction

A Planning Application is being lodged to An Bord Pleanála (ABP) by BAM Property for a Strategic Housing Development at Castlelake, Carrigtwohill, Co. Cork (hereafter referred to as the 'proposed development site'). Permission is being sought for the construction of 716 No. residential units with childcare facility, landscaped spaces and associated works and services (hereafter referred to as the 'proposed development').

This screening for Appropriate Assessment has been undertaken to determine whether the proposal is likely to have a significant effect on any Natura 2000 Site (i.e. Natura 2000 Sites), in view of the sites' conservation objectives.

This screening for Appropriate Assessment has been undertaken by a staff ecologist from Malachy Walsh and Partners (MWP), Engineering and Environmental Consultants.

1.1 Legislative Context

The Habitats Directive (92/43/EEC) seeks to conserve natural habitats and wild fauna and flora by the designation of Special Areas of Conservation (SACs) and the Birds Directive (2009/147/EC)[1] seeks to protect birds of special importance by the designation of Special Protected Areas (SPAs). It is the responsibility of each member state to designate SPAs and SACs, both of which form part of Natura 2000, a network of protected sites throughout the European Community. Further information is available at:

http://ec.europa.eu/environment/nature/legislation/habitatsdirective/

http://www.npws.ie/planning/appropriateassessment/

The current assessment was conducted within this legislative framework and also the DoEHLG (2009) guidelines. As outlined in these, it is the responsibility of the proponent of the project, in this case Tipperary County Council, to provide a comprehensive and objective screening for Appropriate Assessment, which can then be used by the competent authority, in order to conduct the Appropriate Assessment (DoEHLG, 2009).

1.2 Stages of Appropriate Assessment

The Appropriate Assessment process is a four-stage process with issues and tests at each stage. The purpose of the screening assessment is to record in a transparent and reasoned manner the likely effects on Natura 2000 sites of a proposed development. An important aspect of the process is that the outcome at each successive stage determines whether a further stage in the process is required. The stages are set out in **Appendix 1**.

2. Assessment Methodology

2.1 Appropriate Assessment Guidance

This screening for Appropriate Assessment, or Stage 1, has been undertaken in accordance with the European Commission Methodological Guidance on the provision of Article 6(3) and 6(4) of the Habitats Directive 92/43/EEC (EC, 2001), the European Commission Guidance '*Managing Natura 2000 Sites*' Brussels, 21.11.2018 C (2018) 7621 final (EC, 2000), and *Appropriate Assessment of Plans & Projects - Guidance for Planning Authorities* prepared by

[1] This is the codified version of Directive 79/409/EEC as amended (see http://ec.europa.eu/environment/nature/legislation/birdsdirective/index_en.htm)

the NPWS (DoEHLG, 2009 (rev. 2010) and the *Planning Regulator: - Appropriate Assessment Screening for Development Management , OPR Practice Note PN01* Office of the Planning Regulator, 2021.

2.2 Desk Study

In order to complete the screening for Appropriate Assessment certain information on the existing environment is required. A desk study was carried out to collate available information on the subject site's natural environment. This comprised a review of the following publications, data and datasets:

- OSI Aerial photography and 1:50000 mapping
- National Parks and Wildlife Service (NPWS)
- National Biodiversity Data Centre (NBDC) (on-line map-viewer)
- BirdWatch Ireland
- Teagasc soil area maps (NBDC website)
- Geological Survey Ireland (GSI) area maps
- Environmental Protection Agency (EPA) water quality data
- South Eastern River Basin District (SWRBD) datasets (Water Framework Directive)
- Other information sources and reports footnoted in the course of the report

2.3 Site Visit

An ecological field survey was conducted by a staff ecologist with MWP on 16th August 2021. The aim of this survey was to characterise the site and environs and establish the ecological features and resources at the site, particularly in relation to the features of interest of the Cork Harbour SPA and Great Island Channel SAC which are located downstream of the proposed footprint of works.

Aerial photography was used together with GPS to accurately enable field navigation. Notes were made on all habitats encountered, including notes on dominant and indicative vegetation. An assessment was also made of the topography and drainage, disturbance, and management of the area. The presence of any invasive plant species was also noted.

3. Screening for Appropriate Assessment

As set out in the NPWS guidance (DoEHLG, 2009), the task of establishing whether a plan or project is likely to have an effect on a Natura 2000 Site is based on a preliminary impact assessment using available information and data, including that outlined above, and other available environmental information, supplemented as necessary by local site information and ecological surveys. This is followed by a determination of whether there is a risk that the effects identified could be significant. The precautionary principle approach is required.

Once the potential impacts that may arise from the proposal are identified the significance of these is assessed through the use of key indicators:

- Habitat loss
- Habitat alteration
- Habitat or species fragmentation
- Disturbance and/or displacement of species
- Water quality and resource.

Screening for Appropriate Assessment (Stage 1) determines the need for a full Appropriate Assessment (Stage 2) and consists of a number of steps, each of which is addressed in the following sections of this report:

4.1 Establish whether the proposed remediation works are necessary for the management of a Natura 2000 Site

4.2 Description of the proposed remediation works

4.3 Identification of Natura 2000 Sites potentially affected

4.4 Identification and description of potential individual and cumulative impacts of the works

4.5 Assessment of the significance of the impacts on the integrity of Natura 2000 Sites

4.6 Conclusion of screening stage

The purpose of the screening assessment is to record in a transparent and reasoned manner the likely effects, on relevant Natura 2000 Sites, of the proposed development works.

3.1 Management of Natura 2000 Sites

The proposal is not connected with or necessary to the conservation management of a Natura 2000 Site.

3.2 Description of the Proposed Development

The proposed development consists of the construction of a strategic housing development of 716 no. units and a 2 storey creche. The proposed development comprises:

- 224 no. detached, terraced and semi-detached houses,
- 284 no. duplex units and
- 208 no. apartments, one to three bed units.

The two storey houses comprise 48 no. detached, 126 no. semi-detached and 50 no. terraced Houses containing 60 no. two bed units, 139 no. three bed units and 25 no. four bed units. The part-one to part-three storey duplex

units are contained in 122 no. buildings providing 82 no. one bed units, 142 no. two bed units and 60 no. three bed units. There are 7 no. apartments blocks ranging in height from part-1 to part- 5 no. storeys.

- Block 1 is 4 no. storeys and contains 34 no. units (7 no. one bed units, 19 no. two bed units and 8 no. three bed units).
- Block 2 is part-1 to part-5 no. storeys and contains 42 no. units (15 no. one bed units, 20 no. two bed units and 7 no. three bed units).
- Block 3 is 5 no. storeys and contains 17 no. units (8 no. one bed units and 9 no. two bed units).
- Block 4 is 4 no. storeys and contains 13 no. units (6 no. one bed units and 7 no. two bed units).
- Block 5 is 4 no. storeys and contains 13 no. units (6 no. one bed units and 7 no. two bed units).
- Block 6 is 4 no. storeys and contains 13 no. units (6 no. one bed units and 7 no. two bed units).
- Block 7 is 5 no. storeys over basement and contains 76 no. units (23 no. one bed units, 41 no. two bed units and 12 no. three bed units).
- All blocks contain ancillary internal and external resident amenity space.

The proposed development also provides for: hard and soft landscaping; boundary treatments; public realm works; car parking; bicycle stores and shelters; bin stores; lighting; plant rooms; and all ancillary site development works above and below ground.

The development comprises new public open spaces in addition to general landscaping, off street parking and new services including foul, storm, ESB, telecommunications, water, cycle parking, bin storage and public lighting. The proposal includes for the construction of new distributor roads which link to existing roads, a network of cycle paths linking to amenity areas, schools, the nearby trains station and the Dunkettle to Carrigtwohill Greenway.
The proposed landscape design strategy comprises a series of open spaces including 2 large neighbourhood parks; 8 local parks, a 'Village Green/Plaza' area; communal amenity space for the apartments; incidental open space; and streetscape planting.

The site boundary is shown in **Figure 1** and the Site Layout is shown on **Figure 2.**

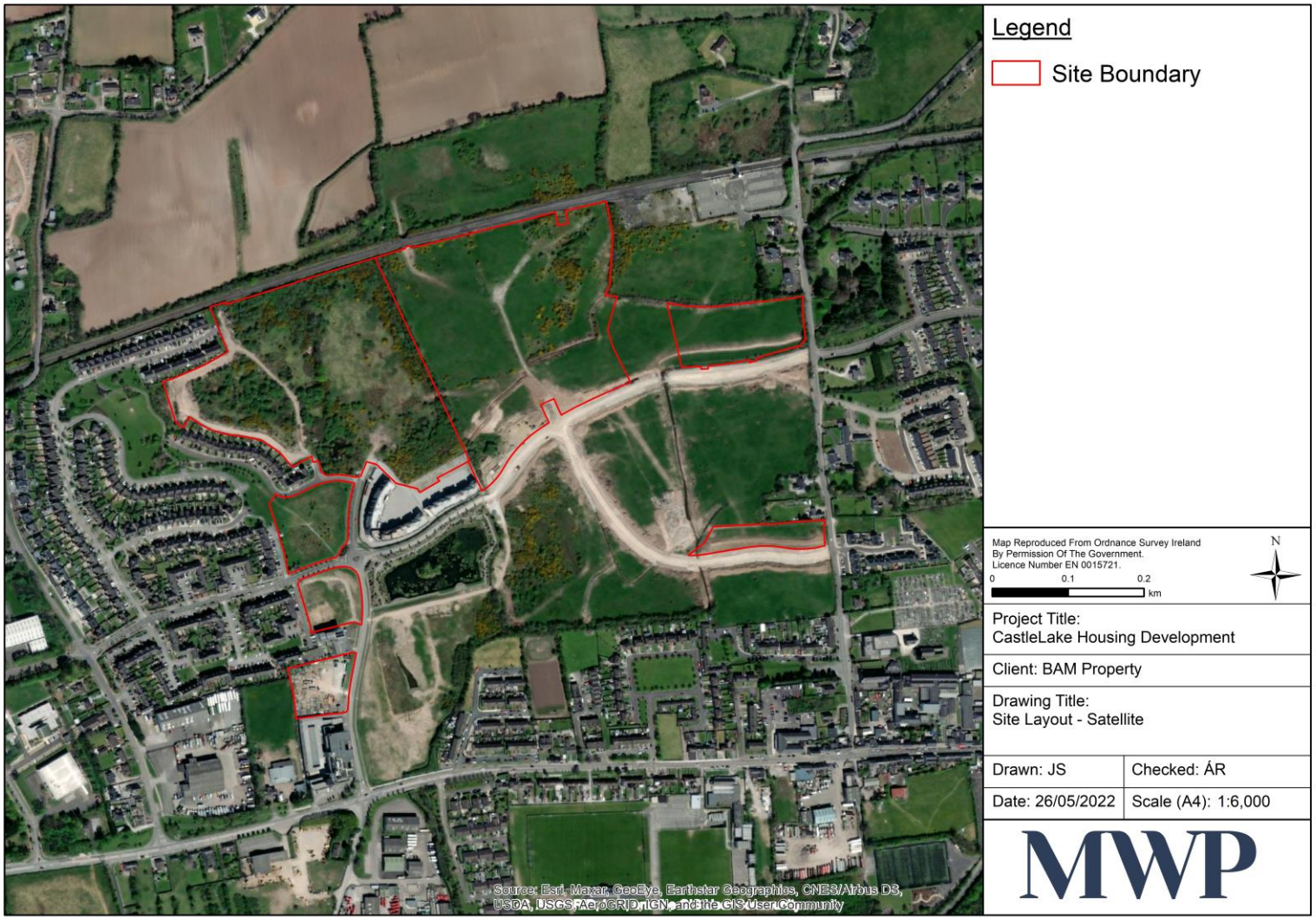


Figure 1: Site redline boundary

Figure 2 Site Layout

3.3 Purpose of the Project

The proposed development will assist in addressing the current housing need and seeks to rejuvenate a strategic parcel of land through higher density in line with zoning objectives.

Carrigtwohill continues to be designated as a Strategic Employment Area as per the Cork County Development Plan 2022-2028, a primary location for industrial development and important location for high technology manufacturing.

The site is well served by schools with one post primary and 2 primary schools located to the south. Cork Education and Training Board (CETB) have planning permission for a new post-primary school and associated infrastructure adjacent to the BAM Property lands. It is understood that some of the roads and services infrastructure works relating to the school development is currently under construction by BAM on behalf of CETB.

The ability of the town to provide a strong supply of housing and business land and the availability of a commuter rail service will make this a particularly sustainable settlement. There are no water supply constraints or deficits in wastewater infrastructure. As a consequence, Carrigtwohill is well placed to facilitate rapid yet sustainable growth and development.

3.4 Site Location

The proposed development site is located circa 500m northwest of Carrigtwohill village. The site is bounded by agricultural lands to the north, Castlelake housing estate to the west and the Cork Road L3680 to the south. The site is accessed from the Cork Road L3680. Access is also possible from the west via the Castlelake housing estate. The N25 can be accessed to the west and east.

The proposed development bounds the Cork-Midleton Railway line to the north. Carrigtwohill train station is located to the north east of the site. The train station serves Midleton and Cobh to the east and south and Cork to the west, with onward links to Dublin and the rest of the country.

The new Glounthaune to Midleton Greenway will pass to the south of the site providing an alternative commuter link to Cork and Midleton and also providing an amenity for existing and future residents and visitors. An east-west link road is currently under construction along the southern boundary of the main land block. A north-south link road is proposed to join with an existing rail underpass. Refer to Figure 3 Site Location.

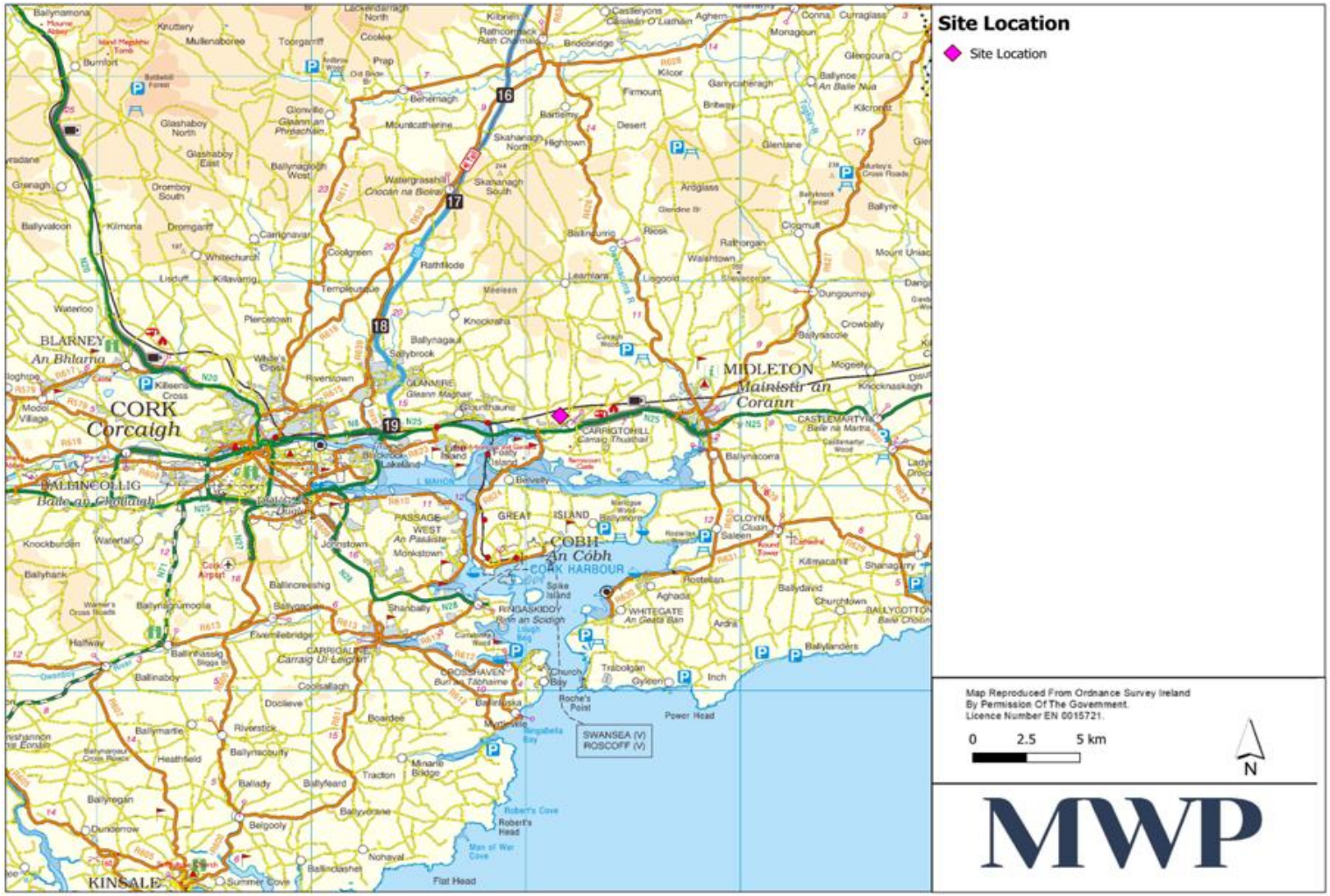


Figure 3 Site Location

3.5 Site Description

The proposed development is relatively flat with the highest elevation of the proposed development being ca.9m AOD. The predominant CORINE (2018) landcover at the proposed development is classified as 'Agricultural Areas/Pastures' with some sections at southwest of site made up of 'Artificial Surfaces – Discontinuous urban fabric'.

According to the online Geological Survey Ireland (GSI) online mapper, the proposed development site is underlain by Massive unbedded lime-mudstone from Walsortian Limestones formation at the southern end and Dark muddy limestone, shale of the Ballysteen Formation at the northern end.

Subsoil at the proposed development is classed as 'Sandstone till (Devonian)'. The majority of the aquifer is designated as Regionally Important Aquifer - Karstified (diffuse) with a section at the northern end which is categorised as 'Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones'. The groundwater vulnerability of the aquifer is stated as stated mostly as 'moderate' with small sections of the north side of the proposed development designated as 'high'. The GSI define groundwater vulnerability as "…a term used to represent the intrinsic geological and hydrogeological characteristics that determine the ease which groundwater may be contaminated by human activities"

The proposed development is located within the 'Lee, Cork Harbour and Youghal Bay' Water Framework Directive (WFD) catchment (Code:19) and the Tibbotstown_SC_010 sub-catchment. This catchment includes the area drained by the River Lee and all streams entering tidal water in Cork Harbour and Youghal Bay and between Knockaverry and Templebreedy Battery, Co. Cork, draining a total area of 2,153km².

There are a number of waterbodies on site. The Woodstock stream is the largest stream which enters the eastern-most land block near Station Road and flows in a westerly direction before turning south where it flows into the Slatty Pond, which is hydrological connected Great Island SAC (001058) and Cork Harbour SPA (004030). Another drainage ditch bisects the main land block and flows in a southerly direction towards the Woodstock Stream at the southwest of the site.

There is a man-made lake (attenuation pond/lagoon) to the south of the main land block which is currently used as an amenity by local residents. The pond has an overflow into the Woodstock Stream.

The Woodstock Stream joins with a transitional waterbody named Slatty Pond which is located just east of the Slatty Bridge, approximately 900m southwest of the closest point of the proposed development. This transitional water flows under Slatty Bridge, into Slatty Water and on to Lough Mahon (Harpers Island), another transitional waterbody.

Data from the EPA's Water Framework Directive (WFD) monitoring depicts the Lough Mahon as having 'moderate' water quality (2013-2018). There is no WFD monitoring data for Slatty Bridge or any of the waterbodies on or leaving the site. The Woodstock Stream is not a designated salmonoid river and is not in an area designated for Freshwater pearl Mussel.

The EPA has classed the risk of Lough Mahon (Harpers Island) of failing to meets its WFD objectives as 'At risk'.

3.6 Habitats

Habitats within the footprint of the proposed project were surveyed and classified according to Fossitt, 2000. Habitat maps are presented in **Figure 4.**

Amenity Grassland GA2

There are small areas of amenity grassland at the north-western corner of the development site. These are landscaped areas near adjacent housing. This is primarily comprised of perennial rye grass *Lolium perenne*, common mouse-ear *Cerastium fontanum*, daisy *Bellis perennis*, and white clover *Trifolium repens.*

Amenity Grassland x Ornamental/Non-Native Shrub GA2 x WS3

One area of amenity grassland is the remnant of a front garden, and includes some ornamental shrubs. This area is located in the north-west of the site. It is comprised of perennial rye grass *Lolium perenne*, common mouse-ear *Cerastium fontanum*, daisy *Bellis perennis*, white clover *Trifolium repens*, and bird foot trefoil *Lotus corniculatus.* There are a number of ornamental shrubs along the original periphery of this lawn, including a rose species *Rosa* sp., and dwarf cypress species.

Plate 1 Amenity Grassland x Ornamental/Non-Native Shrub GA2 x WS3

Amenity Grassland x Scatterred Trees and Parkland GA2 x WD5

Landcaped areas are comprised of amenity grassland and non-native species of sycamore and beech. This is most prominent in the west of the site. The amenity grassland is comprised of perennial rye grass *Lolium perenne*, common mouse-ear *Cerastium fontanum*, daisy *Bellis perennis*, and white clover *Trifolium repens.* Ornamental trees present are primarily maple species *Acer* sp.

Buildings and Artificial Surfaces BL3

Roadways, kerbing, buildings and other infrastructure on site are comprised of artificial, man-made materials.

Plate 2 Buildings and Artificial Surfaces BL3

Immature Woodland x Scrub WS5 x WS1

The west and south west of the site is dominated by immature woodland and scrub. The dominant species here is goat willow *Salix caprea*. Bramble gorse *Ulex europaeus*, and bramble *Rubus fruticosus* agg. are also abundant in this area.

Plate 3 Immature Woodland x Scrub WS5 x WS1

Improved Agricultural Grassland GA1

The south east of the site is comprised of immature agricultural grassland. This is dominated by perennial rye grass *Lolium perenne*, with abundant white clover *Trifolium repens*, broad-leaved dock *Rumex obtusifolius*, dandelion *Taraxacum vulgaria*, and ribwort *Plantago lanceolata*.

Plate 4 Improved Agricultural Grassland GA1

Improved Agricultural Grassland x Scrub GA1 x WS1

The majority of the site is comprised of a matrix of improved agricultural grassland and scrub. The grassland is this section has been un-grazed/un-cut for some time. Due to its proximity to the stream it is damp and has species indicative of damper habitats, such as meadowsweet *Filipendula ulmaria*. However, the overall species composition is not consistent with that of Wet Grassland GS4.

The species present include perennial rye grass *Lolium perenne*, with abundant white clover *Trifolium repens*, broad-leaved dock *Rumex obtusifolius*, dandelion *Taraxacum vulgaria*, ribwort *Plantago lanceolata*, and meadowsweet *Filipendula ulmaria.* The scrub is comprised of gorse *Ulex europaeus*, bramble *Rubus fruticosus* agg., and immature willow *Salix cinerea* saplings.

Plate 5 Improved Agricultural Grassland x Scrub GA1 x WS1

Recolonising Bare Ground ED2

There are large areas of disturbed ground throughout the site. Species present include pineappleweed *Matricaria discoidea*, scarlet pimpernel *Anagallis arvensis*, hawkweed *Pilosella officinarum*, dandelion *Taraxacum vulgaria*, and white clover *Trifolium repens*.

Plate 6 Recolonising Bare Ground ED3

Recolonising Bare Ground x Buildings and Artificial Surfaces x Scrub ED3 x BL3 x WS1

An area within the south-west of the site is a matrix of bare ground, limestone rock. This is being recolonised by pineappleweed *Matricaria discoidea*, scarlet pimpernel *Anagallis arvensis*, hawkweed *Pilosella officinarum*, dandelion *Taraxacum vulgaria*, white clover *Trifolium repens*, gorse *Ulex europaeus*, bramble *Rubus fruticosus* agg., willow saplings *Salix caprea*, rosebay willowherb *Chamaenerion angustifolium*, and annual meadow grass *Poa annua*.

Plate 7 Recolonising Bare Ground x Buildings and Artificial Surfaces x Scrub ED3 x BL3 x WS1

Recolonising Bare Ground x Builidings and Artificial Surfaces ED3 x BL3

The site compound at the south-west is on bear ground and limestone trunking. The bare ground is being recolonised by vegetation including pineappleweed *Matricaria discoidea*, scarlet pimpernel *Anagallis arvensis*, hawkweed *Pilosella officinarum*, dandelion *Taraxacum vulgaria*, and white clover *Trifolium repens*.

Recolonising Bare Ground x Dry Meadows and Grassy Verges ED3 x GS2

At the north-west, a path of cleared ground has been cleared and is being recolonised by species including pineappleweed *Matricaria discoidea*, scarlet pimpernel *Anagallis arvensis*, hawkweed *Pilosella officinarum*, dandelion *Taraxacum vulgaria*, white clover *Trifolium repens*, and creeping thistle *Cirsium arvense*.

Plate 8 Recolonising Bare Ground x Dry Meadows and Grassy Verges ED3 x GS2

Scrub WS1

There are areas of scrub within the site, dominated by gorse *Ulex europaeus*, and bramble *Rubus fruticosus* agg., immature gorse *Ulex europaeus*, bramble *Rubus fruticosus* agg., rosebay willowherb *Chamaenerion angustifolium, and* broad-leaved dock *Rumex obtusifolius.*

Plate 9 Scrub WS1

Spoil and Bare Ground ED2

There are deposits of spoil throughout the site as a result of construction works.

Plate 10 Spoil and Bare Ground ED2

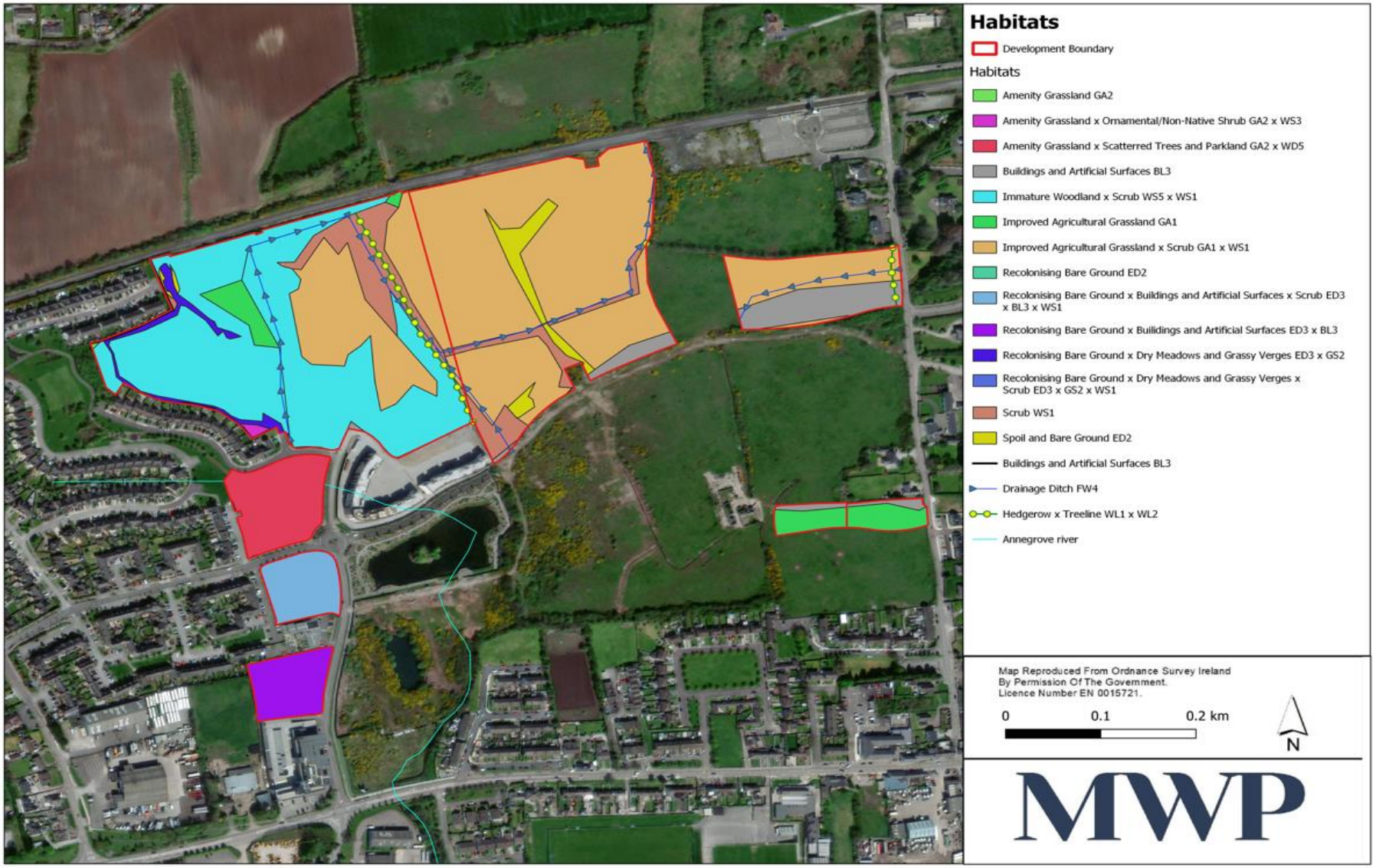


Figure 4 Habitats recorded in proposed development area

3.7 Invasive Species

The following invasive species were recorded during ecological surveying within the redline boundary of the site:

- Himalayan balsam *Impatiens glandulifera*
- Japanese Rose *Rosa rugosa*

Of these, Himalayan balsam is listed under the Third Schedule to the European Communities (Birds and Natural Habitats) Regulations 2011 (regulations 49 and 50). Himalayan balsam is present throughout the site within the development boundary. Japanese Rose is not listed on the Third Schedule and occurs in one location within the redline boundary of the proposed development.

It was noted by MWP ecologists that Curly waterweed and *Elodea* sp. (both listed in the Third Schedule to the European Communities (Birds and Natural Habitats) Regulations 2011 (regulations 49 and 50) were recorded outside of the development boundary in Castlelake.

An invasive species management plan is being prepared to manage, treat and prevent the spread of the invasive species which occur within the site boundaries for the proposed development.

The locations of invasive species recorded within the proposed development site redline boundary (and contiguous stands of Himalayan balsam extending outside of the redline boundary), are presented in Figure 5 below.

Figure 5 Invasive Species - Showing areas of Himalayan balsam (Impatiens glandulifera – green hatching) within and adjacent to site and Japanese Rose location (Rosa rugosa) within the site redline boundary (pink circle)

3.8 Characteristics of the Project

The proposal is described below and has been confirmed with the project engineer.

Size, scale, area, land-take	The land take of the project is 18.256 hectares, with a developable area of 16.6 hectares.
Details of physical changes that will take place during the various stages of implementing the proposal	The Carrigtwohill SHD project will comprise: 716 no. units The project will necessitate the excavation of existing ground levels to a depth of 300-500mm, formation of suitable subbase and levels, construction of utilities including drainage, installation of new street surface paving, green spaces, play areas, street furniture and lighting. Vegetation clearance will be undertaken in all areas. Waste generated during the demolition works will be managed in accordance with a detailed Construction Waste Management Plan (WMP). The plan will be prepared by the main contractor carrying out the works and issued to ABP/CCC for agreement prior to any works commencing on site.
Description of resource requirements for the construction/operation and decommissioning of the proposal (water resources, construction material, human presence etc)	Construction activity will include shallow and localised excavations to maximum depth of 500mm bgl. It is anticipated that most of the material excavated will be topsoil/subsoil. It is not anticipated that in-situ rock breaking will be required. The following Materials and approximate volumes are required for the works: • Concrete – 30,000m^3 • Precast/Granite setts/Tarmac/Resin Bound path – 30,000m2 • Topsoil – circa 50,000m3 • Ducting, comms, lighting, power – 20,000m • Pipework foul & storm 10,000m Soil will be put to beneficial re-use on site where feasible. It is expected that there will be between 40 and 75 number of personnel on-site depending on the phase of the project.
Description of timescale for the various activities that will take place as a result of implementation (including likely start and finish date)	The proposed works are due to commence in Q2 or Q3 of 2023 and are likely to take 72 months to conclude.
Description of wastes arising and other residues (including quantities) and their disposal	Waste is expected to consist of top soil, subsoil and green waste from vegetation removal. Small quantities of incidental waste materials such as pallets and packaging will also be generated. No hazardous waste material will be generated. All waste will be managed and segregated into appropriate skips in a designated waste management compound in accordance with the Construction Waste

	Management Plan. Waste will be transferred from the site by an authorised haulier to a suitably authorised waste facility. Volumes are estimated as follows: • Topsoil 50,000m3 to be reused on site where feasible • Rock 0m^3
Identification of wastes arising and other residues (including quantities) that may be of particular concern in the context of the Natura 2000 network	There will be no hazardous waste generated by the proposed works. As part of the Construction WMP individual waste streams will be identified at source and stored in dedicated skips for subsequent disposal to licensed landfill or to recycling.
Description of any additional services required to implement the project or plan, their location and means of construction	A site compound will be required for the contractor to undertake the works. This will be located along the southern boundary of the main land block. Fuels will be stored within a bunded area in the enclosed compound along with tools, materials, etc. All plant is to be refuelled in this compound at a location within the compound that is a minimum of 25m away from any watercourse. Drip trays will be fitted to any stationary plant working in proximity to any watercourse.

3.9 Identification of Other Projects or Plans or Activities

The proposed development is located within Carrigtwohill, which is subject to ongoing retail, commercial and residential development.

Current relevant applications for planning permission include as of 11/05/2022:

- Construction of 277 no. residential units (17/5399)
- Construction of a new school (19/5707)
- Upgrade of existing internal access roads providing dedicated shared use cycleway and footpath, pedestrian and cycle crossing point, bus lane, bus shelter and traffic safety barrier (19/5836).
- Extension to existing manufacturing facility (19/5877)
- Extension to existing manufacturing facility (19/6052)
- Installation of solar panels on a roof of a manufacturing facility (21/5251)
- Construction of 63 no. residential units (21/7130) – AA screening report filed in support of this application.
- Demolition of existing buildings/structures and construction of mixed-use development comprising of 5 no. buildings comprising 43 no. residential units (14 no. one bed units and 29 no. two bed units) and mixed uses including retail, offices, pharmacy and café (22/4440) – Decision pending, subject to further information request.
- Development of a container storage facility (22/4736) – Decision pending subject to further information request.
- The demolition of existing switch room and an existing drum store and the construction of a new 3 storey manufacturing building to the east of the existing manufacturing building (22/4839) – Decision pending, subject to further information request. AA screening report and NIS filed in support of this application.
- The construction of 47 no. dwelling houses and all ancillary site works (22/5005) – Decision pending
- Carrigtwohill URDF–Public Realm Infrastructure Bundle: Part 8 proposal for Main Street and Station Road Public Realm Works including footpath widening, road re-alignment, resurfacing, signalisation, traffic calming measures, street lighting, demolition of buildings at the junction of Main Street and Station Road along with other small scale demolition works, and provision of new public spaces, upgrade of Wises Road junction, additional capacity measures at N25Junction 3 (Cobh Cross) including widening and realignment of approach roads to the roundabout. It is expected that the proposed development will be advertised before year end 2021.
- Bury's Bridge Cycleway: Part 8 consent for strategic cycleway scheme connecting Bury's Bridge at Dunkettle with Carrigtwohill. The cycleway enters the west side of Carrigtwohill to the north of Cobh Cross (N25 Junction 3) and runs parallel to Carrigtwohill Main Street before turning north and running along the Castlelake Access Road where it then joins the link roads associated with the new schools campus permitted under 19/5707.
- Carrigtwohill–Middleton Inter-Urban Cycleway Phase 1: Part 8 strategic cycleway scheme proposal extending from Wises Road, north of the Cork to Middleton railway line at the western end of Carrigtwohill to the east of the Carrigane Road bridge at the eastern end of Carrigtwohill. The scheme will passthrough the Carrigtwohill UEA, cross Wises Road, Station Road, Leamlara Road and Carrigane Road. It will connect to the Carrigtwohill Train Station and the new school campus on Station Road. The

scheme will provide connectivity between the existing IDA Business Park to the west of Wises Road and the industrial zoned lands to the south of the Carrigane Road. It is expected that the proposed development will be advertised before year end 2021

3.10 Identification of Natura 2000 Sites

3.10.1 Zone of Impact Influence

The screening stage of AA involves compiling a 'long list' of Natura 2000 sites within a zone of potential impact influence for later analysis which may or may not be significantly impacted upon by the proposal.

The "zone of influence" for a project is the area over which ecological features may be subject to significant effects as a result of the proposed project and associated activities (CIEEM, 2018). This is likely to extend beyond the site where there are ecological or hydrological connection(s) beyond the site boundaries.

The subject site and a distance of 15km is recommended as a potential zone of influence (Scott Wilson et al., 2006). However, National Parks and Wildlife Service (NPWS) guidance (NPWS, 2009) advises that this zone of influence be assessed on a case-by-case basis with consideration of the nature, size, and location of the project, the sensitivities of the ecological receptors and the potential for cumulative effects. As such, Natura 2000 sites beyond 15km may also be considered based on the potential for an ecological and/or hydrological to the project site, bearing in mind the precautionary principle and using the Source-Pathway-Receptor framework.

Following this, the potential impacts associated with the proposal will be identified before an assessment is made of the likely significance of these impacts.

As described above, the test for the screening for Appropriate Assessment is to assess, in view of best scientific knowledge, if the development, individually or in combination with other plans/project is likely to have a significant effect on a Natura 2000 site. If there are any significant, potentially significant, or uncertain effects, it will be necessary to proceed to Appropriate Assessment and submit an NIS.

Bearing in mind the precautionary principle, Natura 2000 sites within the zone of potential significant impact influence of the proposal site, including their proximity are shown in Figure 6 below. Site synopses for these sites are included in Appendix 2.

Table 1 Natura 2000 Sites within zone of potential impact influence of the proposal site

Designated Site	Site Code	Proximity of Site to Nearest Point of Designated Site	Hydrological/Ecological Connection? (Yes/No)
Cork Harbour SPA	004030	708m south	There is a direct hydrological to Cork Harbour SPA via Woodstock stream which runs north-south through the site (EPA code: IE_SW_19T250870).
Great Island Channel SAC	001058	772m south	There is a direct hydrological to Great Island Channel SAC via Woodstock stream which runs north-south through the site (EPA code: IE_SW_19T250870).
Blackwater River (Cork/Waterford) SAC	002170	12.15km north	This SAC is located upstream of the proposed development and lacks a hydrological or ecological connection.

3.10.2 Characteristics of Natura 2000 Sites

Table 2 lists the qualifying features of Special Conservation Interest for the Natura 2000 sites that lie within the zone of potential impact influence of the subject site. Information pertaining to the Natura 2000 sites is from site synopses, conservation objectives and other information available on www.npws.ie.

Table 2 Natura 2000 sites with qualifying features of Special Conservation Interest.

Natura 2000 Site	Qualifying features of Special Conservation Interest
Cork Harbour SPA	Little Grebe (*Tachybaptus ruficollis*) [A004]
	Great Crested Grebe (*Podiceps cristatus*) [A005]
	Cormorant (*Phalacrocorax carbo*) [A017]
	Grey Heron (*Ardea cinerea*) [A028]
	Shelduck (*Tadorna tadorna*) [A048]
	Wigeon (*Anas penelope*) [A050]
	Teal (*Anas crecca*) [A052]
	Pintail (*Anas acuta*) [A054]
	Shoveler (*Anas clypeata*) [A056]
	Red-breasted Merganser (*Mergus serrator*) [A069]
	Oystercatcher (*Haematopus ostralegus*) [A130]
	Golden Plover (*Pluvialis apricaria*) [A140]
	Grey Plover (*Pluvialis squatarola*) [A141]
	Lapwing (*Vanellus vanellus*) [A142]
	Dunlin (*Calidris alpina*) [A149]
	Black-tailed Godwit (*Limosa limosa*) [A156]
	Bar-tailed Godwit (*Limosa lapponica*) [A157]
	Curlew (*Numenius arquata*) [A160]
	Redshank (*Tringa totanus*) [A162]

Natura 2000 Site	Qualifying features of Special Conservation Interest
	Black-headed Gull (*Chroicocephalus ridibundus*) [A179]
	Common Gull (*Larus canus*) [A182]
	Lesser Black-backed Gull (*Larus fuscus*) [A183]
	Common Tern (*Sterna hirundo*) [A193]
	Wetland and Waterbirds [A999]
Great Island Channel SAC	Mudflats and sandflats not covered by seawater at low tide
	Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)
Blackwater River (Cork/Waterford) SAC	Estuaries [1130]
	Mudflats and sandflats not covered by seawater at low tide [1140]
	Perennial vegetation of stony banks [1220]
	Salicornia and other annuals colonising mud and sand [1310]
	Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]
	Mediterranean salt meadows (*Juncetalia maritimi*) [1410]
	Water courses of plain to montane levels with the *Ranunculion fluitantis and Callitricho-Batrachion* vegetation [3260]
	Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]
	Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0]
	Margaritifera margaritifera (Freshwater Pearl Mussel) [1029]
	Austropotamobius pallipes (White-clawed Crayfish) [1092]
	Petromyzon marinus (Sea Lamprey) [1095]
	Lampetra planeri (Brook Lamprey) [1096]
	Lampetra fluviatilis (River Lamprey) [1099]
	Alosa fallax fallax (Twaite Shad) [1103]
	Salmo salar (Salmon) [1106]
	Lutra lutra (Otter) [1355]
	Trichomanes speciosum (Killarney Fern) [1421]

3.10.3 Conservation Objectives

According to the Habitats Directive, the *conservation status of a natural habitat* will be taken as 'favourable' within its biogeographic range when:

- its natural range and areas it covers within that range are stable or increasing, and
- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and

- the conservation status of its typical species is favourable as defined below.

According to the Habitats Directive, the conservation status of a species means the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations. The conservation status will be taken as 'favourable' within its biogeographic range when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

Site-specific conservation objectives are available for the following sites:

- NPWS (2014) Conservation Objectives: Cork Harbour SPA 004030. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
- NPWS (2014) Conservation Objectives: Great Island Channel SAC 001058. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht
- NPWS (2012) Conservation Objectives: Blackwater River (Cork/Waterford) SAC 002170. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

These have been accessed on the 12th October 2021.

No management plan is available for this site. All conservation objectives together with other designated site information are available on http://www.npws.ie/protectedsites/.

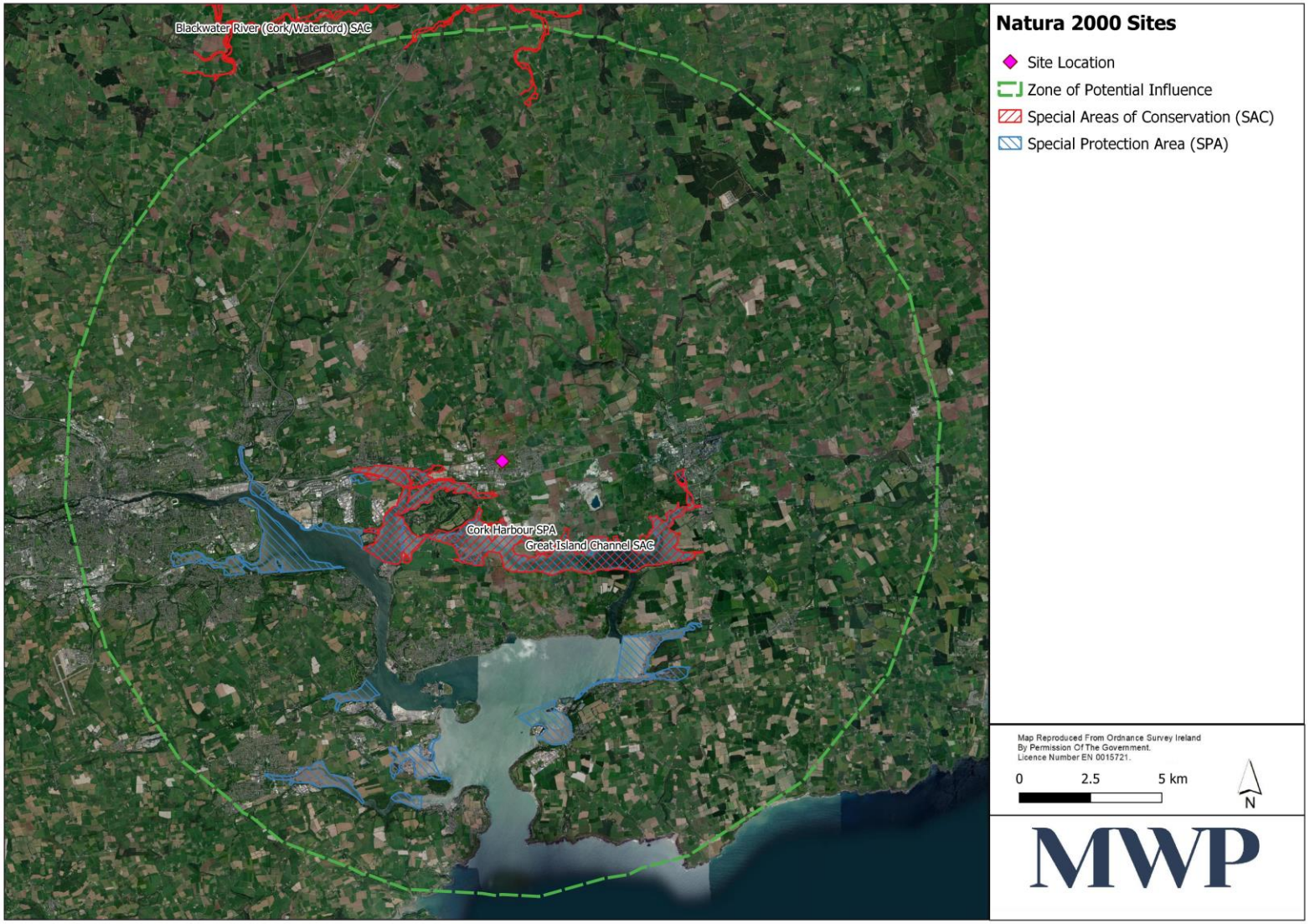


Figure 6 Natura 2000 sites within the zone of potential influence

4.1 Identification of Potential Impacts

Potential likely ecological impacts arising from the project are identified in this section.

Description of elements of the project likely to give rise to potential ecological impacts.	Run-off during construction could enter the Woodstock stream which runs through the site. Construction activities could disturb and spread invasive species from the site to Natura 2000 sites via Woodstock stream.
Describe any likely direct, indirect or secondary ecological impacts of the project (either alone or in combination with other plans or projects) by virtue of: *Size and scale;* *Land-take;* *Distance from Natura 2000 Site or key features of the Site;* *Resource requirements;* *Emissions;* *Excavation requirements;* *Transportation requirements;* *Duration of construction, operation etc.; and* *Other.*	- Size, scale and land-take The proposed project is not located within any Natura 2000 site. - Distance from Natura 2000 site or key features of the site The proposal is not located within any Natura 2000 Site. The Cork Harbour SPA is located ca. 708m south, and Great Island Channel SAC is ca. 772m to the south. The proximity of the proposal to these Natura 2000 sites may give rise to impacts on the species for which they are designated. Blackwater River SAC is at a remove of ca. 12.15km and lacks a hydrological or ecological connection to the proposed development. - Resource requirements Construction of the project will entail the use of soil, steel, stone and water, all of which are typical and readily available construction materials. No significant ecological effect will occur. Potable water will be used during the operational phase. **- Emissions** The main source of waste associated with the project will be during the construction phase. Waste will be managed and segregated in a designated compound for reuse, recycling or authorised disposal. Emissions to water will occur during the construction phase in the form of run off to adjacent water courses. This has the potential to release silt and sediment into the Natura 2000 sites downstream from the proposed project and also in combination with adjacent projects under construction. There will be noise associated with site clearance and construction. This will be localised to the development site and immediate surrounds and will be limited to daylight hours. No significant ecological effect will occur. Emissions in the form of dust are the most likely emissions to air occurring during the construction phase. – Excavations

	Excavation of soil and stone will occur during the construction phase. Material will be reused where possible in the development, in particular for landscaping purposes where feasible. Stockpiling of materials may result in increased sediment run-off to adjacent watercourses. Transportation requirements No transportation will be required within any Natura 2000 site. No significant effect will occur. Vehicles (delivery, contractor) will access the site during the course of the construction works. This will be medium-short term and no significant impact is foreseen. All construction vehicles will be driven on existing site roads and areas of hard standing. Employees will use the site compound for parking and/or use public transport. – Duration of operation, etc. Construction of the proposal is due to commence in in Q2 or Q3 of 2023 and is expected to take 72 months to complete. No significant impact will occur as a result of the duration of the project. The operational phase will be permanent

4.2 Assessment of Significance of Potential Impacts

This section considers the list of sites identified in Table 1, above, together with the potential ecological impacts identified in the previous section and determines whether the project is likely to have significant effects on a Natura 2000 Site. When assessing impact, Natura 2000 Sites are only considered relevant where a credible or tangible source-pathway-receptor link exists between the proposed development and a protected species or habitat type. In order for an impact to occur there must be a risk initiated by having a 'source' (e.g. excavation), and an impact pathway between the source and the receptor (e.g. a waterbody which connects the proposal site to the protected species or habitats). An evaluation based on these factors to determine which Natura 2000 Sites are the plausible ecological receptors for potential impacts of the proposed remediation works will be conducted in Sections 4.2.1 and 4.2.2 below. The evaluation takes cognisance of the scope, scale, nature and size of the project, its location relative to the Natura 2000 Sites listed in Table 1 above, and the degree of connectedness that exists between the project and each Natura 2000 Site's potential ecological receptors.

4.2.1 Natura 2000 Sites outside the zone of potential impact influence

With regards to the proposed development at Carrigtwohill, it is considered that the works do not include any element that has the potential to significantly alter the conservation objectives for which certain Natura 2000 sites are designated. It is considered that the Natura 2000 site listed in Table 3 is outside the zone of potential impact influence of the proposal due to the absence of plausible impact pathways and/or the attenuating effect of the distance intervening. Therefore, it is objectively concluded that significant impacts on this site are not reasonably foreseeable as a result of the programme of works described at Section 3.2. The site, which is listed in Table 3 below, along with its distance and the rationale for exclusion, will not be considered further in this document. A Finding of No Significant Effects report (FONSE) is presented in Appendix 3.

Table 3 Natura 2000 Sites excluded from further assessment

Natura 2000 Site	Proximity of subject site to nearest point of designated site (km)	Rationale for exclusion from assessment
Blackwater River (Cork/Waterford) SAC	12.15km	No source-pathway-receptor present. Intervening distance of 12.15km

4.2.2 Natura 2000 Sites within the zone of potential impact influence

Of the Natura 2000 Sites listed in Table 1, above, two are considered to have the potential to be impacted as a result of the proposal. Construction projects generally pose potential threats to Natura 2000 sites through habitat alteration, species disturbance/displacement and/or water quality impacts. Given the proximity of the proposed development works, there is potential for these impacts to occur within this Natura 2000 Site. Therefore, the assessment of significance of potential impacts that follows focuses on the following Natura 2000 Sites:

Table 4 Natura 2000 Sites within the zone of potential impact influence

Natura 2000 Site	Proximity of subject site to nearest point of designated site (m)	Rationale for inclusion in assessment
Cork Harbour SPA	708m south	There is a direct hydrological to Cork Harbour SPA via Woodstock stream which runs north-south through the site (EPA code: IE_SW_19T250870).
Great Island Channel SAC	772m south	There is a direct hydrological to Great Island Channel SAC via Woodstock stream which runs north-south through the site (EPA code: IE_SW_19T250870).

The likelihood of significant effects to a Natura 2000 Site from the project was determined based on several indicators including:

- Water quality and resource
- Habitat loss
- Habitat alteration
- Habitat or species fragmentation
- Disturbance and/or displacement of species

The likelihood of significant cumulative/in-combination effects is assessed in Section 4.2.2.5.

4.2.2.1 Water Quality

There are some elements of the proposed works which could potentially result in impairment of water quality. In general, where works are conducted within proximity to water bodies, impairment of water quality may potentially occur as a result of run-off of sediment/fines or accidental fuel/oil spills from machinery/equipment. These elements of the proposal could therefore potentially result in pollution of the aquatic environment. The Woodstock stream (IE_SW_19T250870) runs through the proposed development site and is hydrologically connected the two Natura 2000 sites outlined in Table 4. As such, there is a potential for a significant impact on Cork Harbour SPA and Great Island Channel SAC by virtue of a reduction in water quality.

4.2.2.2 Habitat Loss and Alteration

The proposed works are not located within any Natura 2000 sites, and the habitats within the site of the proposed works are not representative of those for which the sites listed in Table 4 are designated (Table 2). As such, habitat loss will not ensue.

There is a direct hydrological connection between the proposed development site and the sites listed in Table 4. As outlined in Section 3.10.1, there is potential for water quality impacts to ensue as a result of the proposed development, and this could potentially alter the aquatic habitat associated with the sites listed in Table 4.

Himalayan balsam is present throughout the site, including along the Woodstock stream. There is potential for this plant to be disturbed and to spread downstream to the sites listed in Table 4. As such, there is potential for a significant impact on the sites listed in Table 4 to ensue by virtue of habitat alteration.

4.2.2.3 Disturbance and/or Displacement of Species

Cork Harbour SPA

The species of conservation interest (SCI) for which Cork Harbour SPA is designated are primarily estuarine in nature, relying on coastal habitats. The habitats within the proposed development site are of low value to these species. While some species, particularly gulls, may occasionally use these habitats for foraging, they are of low ecological value to the SCI. As such, any habitat loss will not result in a significant impact on these species by virtue of displacement.

The proposed development will result in noise emissions. In Castlelake (adjacent to proposed development but outside red line boundary), there is a small island which may be suitable for nesting grey heron (SCI for Cork Harbour SPA) and/or little egret (Annex I species). A single grey heron was observed day roosting here during the ecological walkover survey (Plate 11). There is potential for construction noise to cause disturbance and/or displacement to nesting grey heron/little egret. However, the receiving environment is adjacent to an urban setting and is already subject to ongoing construction of adjacent developments. As such, a significant impact on these species is not considered likely.

Great Island Channel SAC

Great Island Channel SAC is not designated for any species. As such, significant impacts on species cannot be reasonably foreseen.

Plate 11 Grey Heron day-roosting on island within Castlelake

4.2.2.4 Habitat or Species Fragmentation

There is no habitat of qualifying interest present within the proposed development site. As such, habitat fragmentation will not ensue.

The works will not result in any barrier to the movement of any species of qualifying interest. Therefore, there will be no fragmentation of species for which the the sites listed in Table 4 are designated. Thus, no significant impact will occur on the sites listed in Table 4 by virtue of species fragmentation.

4.2.2.5 Cumulative/In-combination Impacts

As well as singular effects, the potential for in-combination or cumulative impacts also need to be considered. A cumulative impact arises from incremental changes caused by past, present and proposed projects together with the proposed development considered in this document.

Relevant plans and projects have been identified in section 3.9 above.

There may be some overlap between the proposed development and construction works associated with the adjacent schools and associated roads project.

Any additional impact would be temporary to short-term, occurring only during the construction phase. However, given the proximity of the projects to the SAC and SPA, in-combination impacts to water quality and habitat alteration due to invasive species cannot be ruled out at this stage.

4.3 Conclusion of Screening Stage

This screening for appropriate assessment was undertaken to determine the potential for likely significant effects of the proposed works, individually, or in combination with other plans or projects, in view of the conservation objectives of any Natura 2000 site. The proposed works described, are within the zone of potential influence of three Natura 2000 sites. It has been objectively concluded that the following sites are not likely to be significantly affected by the proposed works, and can therefore be screened out for appropriate assessment:

- Blackwater River (Cork/Waterford) SAC

A Finding of No Significant Effects Report (FONSE) has been prepared and is presented in **Appendix 3.**

It has been concluded beyond all reasonable scientific doubt that the project is likely to have a significant effect, or significant effects cannot be ruled out at this stage, on Cork Harbour SPA and Great Island Channel SAC. Further assessment is required to determine whether the project is likely to adversely affect the integrity of these Natura 2000 sites, in view of their conservation objectives. An appropriate assessment of the project is required, and a Natura Impact Statement (NIS) must be prepared.

Reasons for Conclusion:

- There is potential for impacts to the water quality of Cork Harbour SPA and Great Island Channel SAC;
- There is a potential for invasive species to be spread downstream and alter the habitats for which Cork Harbour SPA and Great Island Channel SAC are designated.

5. References

Department of the Environment, Heritage and Local Government (DoEHLG) (2009). *Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities.* Department of Environment, Heritage and Local Government.

Directorate General Environment (DGE), (2013), *Interpretation Manual of European Union Habitats- EUR 28*. The European Commission.

Directorate General Environment (DGE) (2007). *Interpretation Manual of European Union Habitats*, European Commission, Brussels.

European Commission (EC) (2000). *Managing Natura 2000 Sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC*. Luxembourg: Office for Official Publications of the European Communities.

European Commission (EC) (2001). *Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC*. Luxembourg: Office for Official Publications of the European Communities.

Franklin, Alan B., Noon, Barry R. & Luke George T., (2002). What is Habitat Fragmentation?, Studies in Avian Biology No. 25: 20-29.

NPWS, 2013. The Status of EU Protected Habitats and Species in Ireland. Species Assessments Volume 3, Version 1.0., Dublin, Ireland: Unpublished report. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

Colhoun, K. & Cummins, S., 2013. Birds of Conservation Concern in Ireland 2014-2019. *Irish Birds,* Volume 9, pp. 523-544.

DGE, 2013. *Interpretation Manual of European Union Habitats EUR28,* s.l.: European Commission Directorate General of Environment.

King, J. J. & Linnane, S. M., 2004. *The status and distribution of lamprey and shad in the Slaney and Munster Blackwater SACs. Irish Wildlife Manuals, No. 14.,* Dublin, Ireland: National Parks and Wildlife Service, Department of Environment, Heritage and Local Government.

King, J. L. et al., 2011. *Ireland Red List No. 5: Amphibians, Reptiles and Freshwater Fish,* Dublin, Ireland: National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS, 2013a. *The Status of EU Protected Habitats and Species in Ireland. Habitats Assessment Volume 2. Version 1.1.,* Dublin, Ireland: Unpublished report, National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS, 2013b. *The Status of EU Protected Habitats and Species in Ireland. Species Assessments Volume 3, Version 1.0.,* Dublin, Ireland: Unpublished report. National Parks and Wildlife Service, Department of Arts, Heritgae and the Gaeltacht.

Appendix 1

Stages of Appropriate Assessment

Stage 1 - Screening

This is the first stage of the Appropriate Assessment process and that undertaken to determine the likelihood of significant impacts as a result of a proposed project or plan. It determines need for a full Appropriate Assessment.

If it can be concluded that no significant impacts to Natura 2000 Sites are likely then the assessment can stop here. If not, it must proceed to Stage 2 for furthermore detailed assessment.

Stage 2 - Natura Impact Statement (NIS)

The second stage of the Appropriate Assessment process assesses the impact of the proposal (either alone or in combination with other projects or plans) on the integrity of the Natura 2000 Site with respect to the conservation objectives of the site and its ecological structure and function. This is a much more detailed assessment that Stage 1. A Natura Impact Statement containing a professional scientific examination of the proposal is required and includes any mitigation measure to avoid, reduce or offset negative impacts.

If the outcome of Stage 2 is negative i.e. adverse impacts to the sites cannot be scientifically ruled out, despite mitigation, the plan or project should proceed to Stage 3 or be abandoned.

Stage 3 - Assessment of alternative solutions

A detailed assessment must be undertaken to determine whether alternative ways of achieving the objective of the project/plan exists.

Where no alternatives exist the project/plan must proceed to Stage 4.

Stage 4 - Assessment where no alternative solutions exist and where adverse impacts remain

The final stage is the main derogation process examining whether there are imperative reasons of overriding public interest (IROPI) for allowing a plan or project to adversely affect a Natura 2000 Site where no less damaging solution exists.

Appendix 2

Site Synopses

SITE SYNOPSIS

Site Name: Great Island Channel SAC

Site Code: 001058

The Great Island Channel stretches from Little Island to Midleton, with its southern boundary being formed by Great Island. It is an integral part of Cork Harbour which contains several other sites of conservation interest. Geologically, Cork Harbour consists of two large areas of open water in a limestone basin, separated from each other and the open sea by ridges of Old Red Sandstone. Within this system, Great Island Channel forms the eastern stretch of the river basin and, compared to the rest of Cork Harbour, is relatively undisturbed. Within the site is the estuary of the Owennacurra and Dungourney Rivers. These rivers, which flow through Midleton, provide the main source of freshwater to the North Channel.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes):

[1140] Tidal Mudflats and Sandflats
[1330] Atlantic Salt Meadows

The main habitats of conservation interest in Great Island Channel SAC are the sheltered tidal sand and mudflats and the Atlantic salt meadows. Owing to the sheltered conditions, the intertidal flats are composed mainly of soft muds. These muds support a range of macro-invertebrates, notably *Macoma balthica*, *Scrobicularia plana*, *Hydrobia ulvae*, *Nepthys hombergi, Nereis diversicolor* and *Corophium volutator*. Green algal species occur on the flats, especially *Ulva lactua* and *Enteromorpha* spp. Cordgrass (*Spartina* spp.) has colonised the intertidal flats in places, especially at Rossleague and Belvelly.

The saltmarshes are scattered through the site and are all of the estuarine type on mud substrate. Species present include Sea Purslane (*Halimione portulacoides*), Sea Aster (*Aster tripolium*), Thrift (*Armeria maritima*), Common Saltmarsh-grass (*Puccinellia maritima*), Sea Plantain (*Plantago maritima*), Greater Sea-spurrey (*Spergularia media*), Lax-flowered Sea-lavender (*Limonium humile*), Sea Arrowgrass (*Triglochin maritimum*), Sea Mayweed (*Matricaria maritima*) and Red Fescue (*Festuca rubra*).

The site is extremely important for wintering waterfowl and is considered to contain three of the top five areas within Cork Harbour, namely North Channel, Harper's Island and Belvelly-Marino Point. Shelduck is the most frequent duck species with 800-1,000 birds centred on the Fota/Marino Point area. There are also large flocks of Teal and Wigeon, especially at the eastern end. Waders occur in the greatest density

north of Rosslare, with Dunlin, Godwit, Curlew and Golden Plover the commonest species. A population of about 80 Grey Plover is a notable feature of the area. All the mudflats support feeding birds; the main roost sites are at Weir Island and Brown Island, and to the north of Fota at Killacloyne and Harper's Island. Ahanesk supports a roost also but is subject to disturbance. The numbers of Grey Plover and Shelduck, as given above, are of national importance.

The site is an integral part of Cork Harbour which is a wetland of international importance for the birds it supports. Overall, Cork Harbour regularly holds over 20,000 waterfowl and contains internationally important numbers of Black-tailed Godwit (1,181) and Redshank (1,896), along with nationally important numbers of nineteen other species. Furthermore, it contains large Dunlin (12,019) and Lapwing (12,528) flocks. All counts are average peaks, 1994/95 – 1996/97. Much of the site falls within Cork Harbour Special Protection Area, an important bird area designated under the E.U. Birds Directive.

While the main land use within the site is aquaculture (oyster farming), the greatest threats to its conservation significance come from road works, infilling, sewage outflows and possible marina developments.

The site is of major importance for the two habitats listed on Annex I of the E.U. Habitats Directive, as well as for its important numbers of wintering waders and wildfowl. It also supports a good invertebrate fauna.

SITE SYNOPSIS

SITE NAME: CORK HARBOUR SPA

SITE CODE: 004030

Cork Harbour is a large, sheltered bay system, with several river estuaries - principally those of the Rivers Lee, Douglas, Owenboy and Owennacurra. The SPA site comprises most of the main intertidal areas of Cork Harbour, including all of the North Channel, the Douglas River Estuary, inner Lough Mahon, Monkstown Creek, Lough Beg, the Owenboy River Estuary, Whitegate Bay, Ringabella Creek and the Rostellan and Poulnabibe inlets.

Owing to the sheltered conditions, the intertidal flats are often muddy in character. These muds support a range of macro-invertebrates, notably *Macoma balthica*, *Scrobicularia plana*, *Hydrobia ulvae*, *Nepthys hombergi*, *Nereis diversicolor* and *Corophium volutator*. Green algae species occur on the flats, especially *Ulva* spp. Cordgrass (*Spartina* spp.) has colonised the intertidal flats in places, especially where good shelter exists, such as at Rossleague and Belvelly in the North Channel. Salt marshes are scattered through the site and these provide high tide roosts for the birds. Some shallow bay water is included in the site. Rostellan Lake is a small brackish lake that is used by swans throughout the winter. The site also includes some marginal wet grassland areas used by feeding and roosting birds.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Little Grebe, Great Crested Grebe, Cormorant, Grey Heron, Shelduck, Wigeon, Teal, Mallard, Pintail, Shoveler, Red-breasted Merganser, Oystercatcher, Golden Plover, Grey Plover, Lapwing, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Greenshank, Black-headed Gull, Common Gull, Lesser Black-backed Gull and Common Tern. The site is also of special conservation interest for holding an assemblage of over 20,000 wintering waterbirds. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

Cork Harbour is an internationally important wetland site, regularly supporting in excess of 20,000 wintering waterfowl. Of particular note is that the site supports internationally important populations of Black-tailed Godwit (1,896) and Redshank (2,149) - all figures given are five year mean peaks for the period 1995/96 to 1999/2000. Nationally important populations of the following 19 species occur: Little Grebe (57), Great Crested Grebe (253), Cormorant (521), Grey Heron (80), Shelduck (2,009), Wigeon (1,791), Teal (1,065), Mallard (513), Pintail (57), Shoveler (103), Red-breasted Merganser (121), Oystercatcher (1,809), Golden Plover (3,342), Grey Plover (95), Lapwing (7,569), Dunlin (9,621), Bar-tailed Godwit (233), Curlew (2,237) and Greenshank (46). The Shelduck population is the largest in the country (over 10% of national total). Other species using the site include Mute Swan (38), Whooper Swan (5), Pochard (72), Gadwall

(6), Tufted Duck (64), Goldeneye (21), Coot (53), Ringed Plover (73), Knot (26) and Turnstone (113). Cork Harbour is an important site for gulls in winter and autumn, especially Black-headed Gull (3,640), Common Gull (1,562) and Lesser Black-backed Gull (783), all of which occur in numbers of national importance. Little Egret and Mediterranean Gull, two species which have recently colonised Ireland, also occur at this site.

A range of passage waders occurs regularly in autumn, including such species as Ruff (5-10), Spotted Redshank (1-5) and Green Sandpiper (1-5). Numbers vary between years and usually a few of each of these species over-winter.

Cork Harbour has a nationally important breeding colony of Common Tern (102 pairs in 1995). The birds have nested in Cork Harbour since about 1970, and since 1983 on various artificial structures, notably derelict steel barges and the roof of a Martello Tower. The birds are monitored annually and the chicks are ringed.

Cork Harbour is of major ornithological significance, being of international importance both for the total numbers of wintering birds (i.e. > 20,000) and also for its populations of Black-tailed Godwit and Redshank. In addition, it supports nationally important wintering populations of 22 species, as well as a nationally important breeding colony of Common Tern. Several of the species which occur regularly are listed on Annex I of the E.U. Birds Directive, i.e. Whooper Swan, Little Egret, Golden Plover, Bar-tailed Godwit, Ruff, Mediterranean Gull and Common Tern. The site provides both feeding and roosting sites for the various bird species that use it. Cork Harbour is also a Ramsar Convention site and part of Cork Harbour SPA is a Wildfowl Sanctuary.

SITE SYNOPSIS

Site Name: Blackwater River (Cork/Waterford) SAC

Site Code: 002170

The River Blackwater is one of the largest rivers in Ireland, draining a major part of Co. Cork and five ranges of mountains. In times of heavy rainfall the levels can fluctuate widely by more than 12 feet on the gauge at Careysville. The peaty nature of the terrain in the upper reaches and of some of the tributaries gives the water a pronounced dark colour. The site consists of the freshwater stretches of the River Blackwater as far upstream as Ballydesmond, the tidal stretches as far as Youghal Harbour and many tributaries, the larger of which include the Licky, Bride, Flesk, Chimneyfield, Finisk, Araglin, Awbeg (Buttevant), Clyda, Glen, Allow, Dalua, Brogeen, Rathcool, Finnow, Owentaraglin and Awnaskirtaun. The portions of the Blackwater and its tributaries that fall within this SAC flow through the counties of Kerry, Cork, Limerick, Tipperary and Waterford. Nearby towns include Rathmore, Millstreet, Kanturk, Banteer, Mallow, Buttevant, Doneraile, Castletownroche, Fermoy, Ballyduff, Rathcormac, Tallow, Lismore, Cappoquin and Youghal.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes):

[1130] Estuaries
[1140] Tidal Mudflats and Sandflats
[1220] Perennial Vegetation of Stony Banks
[1310] *Salicornia* Mud
[1330] Atlantic Salt Meadows
[1410] Mediterranean Salt Meadows
[3260] Floating River Vegetation
[91A0] Old Oak Woodlands
[91E0] Alluvial Forests*
[1029] Freshwater Pearl Mussel (*Margaritifera margaritifera*)
[1092] White-clawed Crayfish (*Austropotamobius pallipes*)
[1095] Sea Lamprey (*Petromyzon marinus*)
[1096] Brook Lamprey (*Lampetra planeri*)
[1099] River Lamprey (*Lampetra fluviatilis*)
[1103] Twaite Shad (*Alosa fallax*)
[1106] Atlantic Salmon (*Salmo salar*)
[1355] Otter (*Lutra lutra*)
[1421] Killarney Fern (*Trichomanes speciosum*)

The Blackwater rises in boggy land in east Kerry, where Namurian grits and shales build the low heather-covered plateaux. Near Kanturk the plateaux enclose a basin of productive Coal Measures. On leaving the Namurian rocks the Blackwater turns eastwards along the northern slopes of the Boggeragh Mountains before entering the narrow limestone strike vale at Mallow. The valley deepens as first the Nagles Mountains and then the Knockmealdowns impinge upon it. Interesting geological features along this stretch of the Blackwater Valley include limestone cliffs and caves near the villages and small towns of Killavullen and Ballyhooly; the Killavullen caves contain fossil material from the end of the glacial period. The associated basic soils in this area support the growth of plant communities which are rare in Cork because in general the county's rocks are acidic. At Cappoquin the river suddenly turns south and cuts through high ridges of Old Red Sandstone. The Araglin valley is predominantly underlain by sandstone, with limestone occurring in the lower reaches near Fermoy.

Wet woodlands are found where river embankments have broken down and channel edges are subject to daily inundation. This is particularly evident in the steep-sided valley of the River Bride, between Cappoquin and Youghal. The river side of the embankments was often used for willow growing in the past (most recently at Cappoquin) so that the channel is lined by narrow woods of White and Almond-leaved Willow (*Salix alba* and *S. triandra*), with isolated Crack Willow (*S. fragilis*) and Osier (*S. viminalis*). Rusty Willow (*S. cinerea* subsp. *oleifolia*) spreads naturally into the sites and occasionally, as at Villierstown on the Blackwater and Sapperton on the Bride, forms woods with a distinctive mix of woodland and marsh plants, including Gypsywort (*Lycopus europaeus*), Guelder-rose (*Viburnum opulus*), Bittersweet (*Solanum dulcamara*) and various mosses and algae. These wet woodlands form one of the most extensive tracts of the wet woodland habitat in the country.

A small stand of Yew (*Taxus baccata*) woodland occurs within the site. This is on a limestone ridge at Dromana, near Villierstown. While there are some patches of the wood with a canopy of Yew and some very old trees, the quality is generally poor due to the dominance of non-native and invasive species such as Sycamore (*Acer pseudoplatanus*), Beech (*Fagus sylvatica*) and Douglas Fir (*Pseudotsuga menzsisii*). However, it does have the potential to develop into a Yew dominated stand in the long term and the site should continue to be monitored.

Marshes and reedbeds cover most of the flat areas beside the rivers and often occur in mosaic with the wet woodland. Common Reed (*Phragmites australis*) is ubiquitous and is harvested for thatching. There is also much Marsh-marigold (*Caltha palustris*) and, at the edges of the reeds, the Greater and Lesser Pond-sedge (*Carex riparia* and *C. acutiformis*). Hemlock Water-dropwort (*Oenanthe crocata*), Wild Angelica (*Angelica sylvestris*), Reed Canary-grass (*Phalaris arundinacea*), Meadowsweet (*Filipendula ulmaria*), Common Nettle (*Urtica dioica*), Purple Loosestrife (*Lythrum salicaria*), Common Valerian (*Valeriana officinalis*), Water Mint (*Mentha aquatica*) and Water Forget-me-not (*Myosotis scorpioides*) are all also found.

At Banteer there are a number of hollows in the sediments of the floodplain where subsidence and subterranean drainage have created isolated wetlands, sunk below the level of the surrounding fields. The water rises and falls in these holes depending on the water table and several different communities have developed on the acidic or neutral sediments. Many of the ponds are ringed with Rusty Willow, rooted in the mineral soils but sometimes collapsed into the water. Beneath the densest stands are woodland herbs like Yellow Pimpernel (*Lysimachia nemorum*), with locally abundant Common Water-starwort (*Callitriche stagnalis*) and Marsh Ragwort (*Senecio aquaticus*). One of the depressions has Silver Birch (*Betula pendula*), Ash (*Fraxinus excelsior*), Crab Apple (*Malus sylvestris*) and a little Pedunculate Oak (*Quercus robur*) in addition to the willows.

Floating river vegetation is found along much of the freshwater stretches within the site. The species list is quite extensive, with species such as water-crowfoots, including Pond Water-crowfoot (*Ranunculus peltatus*), Canadian Pondweed (*Elodea canadensis*), pondweed species, including Broad-leaved Pondweed (*Potamogeton natans*), water-milfoil species (*Myriophyllum* spp.), Common Club-rush (*Scirpus lacustris*), water-starwort species (*Callitriche* spp.), Lesser Water-parsnip (*Berula erecta*) particularly on the Awbeg, Water-cress (*Nasturtium officinale*), Hemlock Water-dropwort, Fine-leaved Water-dropwort (*O. aquatica*), Common Duckweed (*Lemna minor*), Yellow Water-lily (*Nuphar lutea*), Unbranched Bur-reed (*Sparganium emersum*) and the moss *Fontinalis antipyretica* all occurring.

The grasslands adjacent to the rivers of the site are generally heavily improved, although liable to flooding in many places. However, fields of more species-rich wet grassland with species such as Yellow Iris (*Iris pseudacorus*), Meadowsweet, Meadow Buttercup (*Ranunculus acris*) and rushes (*Juncus* spp.) occur occasionally. Extensive fields of wet grassland also occur at Annagh Bog on the Awbeg. These fields are dominated by Tufted Hair-grass (*Deschampsia cespitosa*) and rushes.

The Blackwater Valley has a number of dry woodlands; these have mostly been managed by the estates in which they occur, frequently with the introduction of Beech and a few conifers, and sometimes of the invasive species Rhododendron (*Rhododendron ponticum*) and Cherry Laurel (*Prunus laurocerasus*). Oak woodland is well developed on sandstone about Ballinatray, with the acid oak woodland community of Holly (*Ilex aquifolium*), Bilberry (*Vaccinium myrtillus*), Great Wood-rush (*Luzula sylvatica*) and the ferns *Dryopteris affinis* and *D. aemula* occurring in one place. Irish Spurge (*Euphorbia hyberna*) continues eastwards on acid rocks from its headquarters to the west, but there are also many plants of richer soils, for example Wood Violet (*Viola reichenbachiana*), Goldilocks Buttercup (*Ranunculus auricomus*), Broad-leaved Helleborine (*Epipactis helleborine*) and Red Campion (*Silene dioica*). Oak woodland is also found in Rincrew, Carrigane, Glendine, Newport and Dromana. The spread of Rhododendron is locally a problem, as is over-grazing. A few limestone rocks stand over the river in places showing traces of a less acidic woodland type with Ash, False Brome (*Brachypodium sylvaticum*) and Early-purple Orchid (*Orchis mascula*).

In the vicinity of Lismore, two deep valleys cut in Old Red Sandstone join to form the Owenashad River before flowing into the Blackwater at Lismore. These valleys retain something close to their original cover of oak with Downy Birch (*Betula pubescens*), Holly and Hazel (*Corylus avellana*) also occurring. There has been much planting of Beech (as well as some of coniferous species) among the oak on the shallower slopes and here both Rhododendron and Cherry Laurel have invaded the woodland.

The oak wood community in the Lismore and Glenmore valleys is of the classic upland type, in which some Rowan (*Sorbus aucuparia*) and Downy Birch occur. Honeysuckle (*Lonicera periclymenum*) and Ivy (*Hedera helix*) cover many of the trees while Great Wood-rush, Bluebell (*Hyacinthoides non-scripta*), Wood-sorrel (*Oxalis acetosella*) and, locally, Bilberry dominate the ground flora. Ferns present on the site include Hard Fern (*Blechnum spicant*), Male Fern (*Dryopteris filix-mas*), the buckler-ferns *D. dilatata* and *D. aemula*, and Lady Fern (*Athyrium felix-femina*). There are many mosses present and large species such as *Rhytidiadelphus* spp., *Polytrichum formosum, Mnium hornum* and *Dicranum* spp. are noticeable. The lichen flora is important and includes 'old forest' species which imply a continuity of woodland here since ancient times. Tree Lungwort (*Lobaria* spp.) is the most conspicuous and is widespread.

The Araglin valley consists predominantly of broadleaved woodland. Oak and Beech are joined by Hazel, Wild Cherry (*Prunus avium*) and Goat Willow (*Salix caprea*). The ground flora is relatively rich, with Pignut (*Conopodium majus*), Ramsons (*Allium ursinum*), Garlic Mustard (*Alliaria petiolata*) and Wild Strawberry (*Fragaria vesca*). The presence of Ivy Broomrape (*Orobanche hederae*), a local species within Ireland, suggests that the woodland, along with its attendant Ivy, is long established.

Along the lower reaches of the Awbeg River, the valley sides are generally cloaked with mixed deciduous woodland of estate origin. The dominant species is Beech, although a range of other species are also present, e.g. Sycamore, Ash and Horse-chestnut (*Aesculus hippocastanum*). In places the alien invasive species Cherry Laurel dominates the understorey. Parts of the woodlands are more semi-natural in composition, being dominated by Ash, with Hawthorn (*Crataegus monogyna*) and Spindle (*Euonymus europaea*) also present. However, the most natural areas of woodland appear to be the wet areas dominated by Alder and willows (*Salix* spp.). The ground flora of the dry woodland areas features species such as Pignut, Wood Avens (*Geum urbanum*), Ivy and Soft Shield-fern (*Polystichum setiferum*), while the ground flora of the wet woodland areas contains characteristic species such as Remote Sedge (*Carex remota*) and Opposite-leaved Golden-saxifrage (*Chrysosplenium oppositifolium*).

In places along the upper Bride, scrubby, semi-natural deciduous woodland of willow, oak and Rowan occurs, with abundant Great Wood-rush in the ground flora.

The Bunaglanna River passes down a very steep valley, flowing in a north-south direction to meet the Bride River. It flows through blanket bog to heath and then scattered woodland. The higher levels of moisture here enable a vigorous moss and

fern community to flourish, along with a well-developed epiphyte community on the tree trunks and branches.

At Banteer a type of wetland occurs near the railway line which offers a complete contrast to the others. Old turf banks are colonised by Royal Fern (*Osmunda regalis*) and Eared Willow (*Salix aurita*), and between them there is a sheet of Bottle Sedge (*Carex rostrata*), Marsh Cinquefoil (*Potentilla palustris*), Bogbean (*Menyanthes trifoliata*), Marsh St. John's-wort (*Hypericum elodes*) and the mosses *Sphagnum auriculatum* and *Aulacomnium palustre*. The cover is a scraw (i.e. floating vegetation) with characteristic species like Marsh Willowherb (*Epilobium palustre*) and Early Marsh-orchid (*Dactylorhiza incarnata*).

The soil high up the Lismore valleys and in rocky places is poor in nutrients but it becomes richer where streams enter and also along the valley bottoms. In such sites Wood Speedwell (*Veronica montana*), Wood Anemone (*Anemone nemorosa*), Enchanter's-nightshade (*Circaea lutetiana*), Barren Strawberry (*Potentilla sterilis*) and shield-fern (*Polystichum* sp.) occur. There is some Ramsons, Three-nerved Sandwort (*Moehringia trinervia*) and Early-purple Orchid (*Orchis mascula*) locally, with Opposite-leaved Golden-saxifrage, Meadowsweet and Bugle (*Ajuga reptans*) in wet places. A stand of Hazel woodland at the base of the Glenakeeffe valley shows this community well.

The area has been subject to much tree felling in the recent past and re-sprouting stumps have given rise to areas of bushy Hazel, Holly, Rusty Willow and Downy Birch. The ground in the clearings is heathy with Heather (*Calluna vulgaris*), Slender St John's-wort (*Hypericum pulchrum*) and the occasional Broom (*Cytisus scoparius*) occurring.

The estuary and the habitats within and associated with it form a large component of the site. Very extensive areas of intertidal flats, comprised of substrates ranging from fine, silty mud to coarse sand with pebbles/stones are present. The main expanses occur at the southern end of the site, with the best examples at Kinsalebeg in Co. Waterford, and between Youghal and the main bridge north of it across the river in Co. Cork. Other areas occur along the tributaries of the Licky in east Co. Waterford, and Glendine, Newport, Bride and Killahaly Rivers in Waterford west of the Blackwater. There are also large tracts along the Tourig River in Co. Cork. There are narrow bands of intertidal flats along the main river as far north as Camphire Island. Patches of green filamentous algae (*Ulva* sp. and *Enteromorpha* sp.) occur in places, while fucoid algae are common on the more stony flats, even as high upstream as Glenassy or Coneen.

The area of saltmarsh within the site is small. The best examples occur at the mouths of the tributaries and in the townlands of Foxhole and Blackbog. Those found are generally characteristic of Atlantic salt meadows. The species list at Foxhole consists of Common Saltmarsh-grass (*Puccinellia maritima*), small amounts of Greater Sea-spurrey (*Spergularia media*), glasswort (*Salicornia* sp.), Sea Arrowgrass (*Triglochin maritima*), Annual Sea-blite (*Suaeda maritima*) and Sea Purslane (*Halimione*

portulacoides) - the latter a very recent coloniser. Some Sea Aster (*Aster tripolium*) occurs, generally with Creeping Bent (*Agrostis stolonifera*). Sea Couch (*Elymus pycnanthus*) and small isolated clumps of Sea Club-rush (*Scirpus maritimus*) are also seen. On the Tourig River additional saltmarsh species found include sea-lavenders (*Limoniun* spp.), Thrift (*Armeria maritima*), Red Fescue (*Festuca rubra*), Common Scurvygrass (*Cochlearia officinalis*) and Sea Plantain (*Plantago maritima*). Oraches (*Atriplex* spp.) are found on channel edges. Species such as Saltmarsh Rush (*Juncus gerardi*) and Sea Rush (*J. maritimus*) are found in places in this site also, and are indicative of Mediterranean salt meadows. Areas of *Salicornia* mud are found at the eastern side of the townland of Foxbole above Youghal, at Blackbog, along the Tourig and Kinsalebeg esturaies.

The shingle spit at Ferrypoint supports a good example of perennial vegetation of stony banks. The spit is composed of small stones and cobbles and has a well developed and diverse flora. At the lowest part, Sea Beet (*Beta vulgaris* subsp. *maritima*), Curled Dock (*Rumex crispus*) and Yellow Horned-poppy (*Glaucium flavum*) occur, while at a slightly higher level Sea Mayweed (*Matricaria maritima*), Cleavers (*Galium aparine*), Rock Samphire (*Crithmum maritimum*), Sea Sandwort (*Honkenya peploides*), Spear-leaved Orache (*Atriplex prostrata*) and Babington's Orache (*A. glabriuscula*). Other species present include Sea Rocket (*Cakile maritima*), Herb-Robert (*Geranium robertianum*), Red Fescue and Kidney Vetch (*Anthyllis vulneraria*). The top of the spit is more vegetated and supports lichens and bryophytes, including *Tortula ruraliformis* and *Rhytidiadelphus squarrosus*.

The site supports several Red Data Book plant species, i.e. Starved Wood-sedge (*Carex depauperata*), Killarney Fern (*Trichomanes speciosum*), Pennyroyal (*Mentha pulegium*), Bird's-nest Orchid (*Neottia nidus-avis*), Golden Dock (*Rumex maritimus*) and Bird Cherry (*Prunus padus*). The first three of these are also protected under the Flora (Protection) Order, 2015, while the Killarney Fern is also listed on Annex II of the E.U. Habitats Directive. The following plants, relatively rare nationally, are also found within the site: Toothwort (*Lathraea squamaria*) - associated with woodlands on the Awbeg and Blackwater; Summer Snowflake (*Leucojum aestivum*) and Flowering Rush (*Butomus umbellatus*) on the Blackwater; Common Calamint (*Calamintha ascendens*), Red Campion, Sand Leek (*Allium scorodoprasum*) and Wood Club-rush (*Scirpus sylvaticus*) on the Awbeg.

The site is also important for the presence of several E.U. Habitats Directive Annex II animal species, including Sea Lamprey (*Petromyzon marinus*), Brook Lamprey (*Lampetra planeri*), River Lamprey (*L. fluviatilis*), Twaite Shad (*Alosa fallax fallax*), Freshwater Pearl Mussel (*Margaritifera margaritifera*), Otter (*Lutra lutra*) and Salmon (*Salmo salar*). The Awbeg supports a population of White-clawed Crayfish (*Austropotamobius pallipes*). This threatened species has been recorded from a number of locations and its remains are also frequently found in Otter spraints, particularly in the lower reaches of the river. The freshwater stretches of the Blackwater and Bride Rivers are designated salmonid rivers. The Blackwater is noted for its enormous run of salmon over the years. The river is characterised by significant pools, streams, glides, and generally, a good push of water coming through except in

very low water. Spring salmon fishing can be carried out as far upstream as Fermoy and is highly regarded especially at Careysville. The Bride, main Blackwater upstream of Fermoy, and some of the tributaries are more associated with grilse fishing.

The site supports many of the mammal species occurring in Ireland. Those which are listed in the Irish Red Data Book include Pine Marten, Badger and Irish Hare. The bat species Natterer's Bat, Daubenton's Bat, Whiskered Bat, Brown Long-eared Bat and Pipistrelle, can be seen feeding along the river, roosting under the old bridges and in old buildings.

Common Frog, a Red Data Book species that is also legally protected (Wildlife Act, 1976), occurs throughout the site. The rare bush cricket *Metrioptera roselii* (Order Orthoptera) has been recorded in the reed/willow vegetation of the river embankment on the Lower Blackwater River. The Swan Mussel (*Anodonta cygnea*), a scarce species nationally, occurs at a few sites along the freshwater stretches of the Blackwater.

Several bird species listed on Annex I of the E.U. Birds Directive are found on the site. Some use it as a staging area, others are vagrants, while others use it more regularly. Internationally important numbers of Whooper Swan (average peak 174, 1994/95-95/96) and nationally important numbers Bewick's Swan (average peak 5, 1996/97-2000/01) use the Blackwater Callows. Golden Plover occur in regionally important numbers on the Blackwater estuary (average peak 885, 1984/85-86/87) and on the River Bride (absolute maximum 2,141, 1994/95). Staging Terns visit the site annually, with >300 Sandwich Tern and >200 Arctic/Common Tern (average peak 1974-1994). The site also supports populations of the following: Red Throated Diver, Great Northern Diver, Barnacle Goose, Ruff, Wood Sandpiper and Greenland White-fronted Goose. Three breeding territories for Peregrine Falcon are known along the Blackwater Valley. This, the Awbeg and the Bride River are also thought to support at least 30 pairs of Kingfisher. Little Egret breed at the site (12 pairs in 1997, 19 pairs in 1998).

The site holds important numbers of wintering waterfowl. Both the Blackwater Callows and the Blackwater Estuary Special Protection Areas (SPAs) hold internationally important numbers of Black-tailed Godwit (average peak 847, 1994/95-95/96 on the callows, average peak 845, 1974/75-93/94 in the estuary). The Blackwater Callows also hold Wigeon (average peak 2,752), Teal (average peak 1,316), Mallard (average peak 427), Shoveler (average peak 28), Lapwing (average peak 880), Curlew (average peak 416) and Black-headed Gull (average peak 396) (counts from 1994/95-95/96). Numbers of birds using the Blackwater Estuary, given as the mean of the highest monthly maxima over 20 years (1974-94), are Shelduck (137 +10 breeding pairs), Wigeon (780), Teal (280), Mallard (320 + 10 breeding pairs), Goldeneye (11-97), Oystercatcher (340), Ringed Plover (50 + 4 breeding pairs), Grey Plover (36), Lapwing (1,680), Knot (150), Dunlin (2,293), Snipe (272), Black-tailed Godwit (845), Bar-tailed Godwit (130), Curlew (920), Redshank (340), Turnstone (130), Black-headed Gull (4,000) and Lesser Black-backed Gull (172). The greatest

numbers (75%) of the wintering waterfowl of the estuary are located in the Kinsalebeg area on the east of the estuary in Co. Waterford. The remainder are concentrated along the Tourig estuary on the Co. Cork side.

The river and river margins also support many Heron, non-breeding Cormorant and Mute Swan (average peak 53, 1994/95-95/96 in the Blackwater Callows). Heron occurs all along the Bride and Blackwater Rivers: 2 or 3 pairs at Dromana Rock; approximately 25 pairs in the woodland opposite; 8 pairs at Ardsallagh Wood and around 20 pairs at Rincrew Wood have been recorded. Some of these are quite large and significant heronries. Significant numbers of Cormorant are found north of the bridge at Youghal and there are some important roosts present at Ardsallagh Wood, downstream of Strancally Castle and at the mouth of the Newport River. Of note are the high numbers of wintering Pochard (e.g. 275 individuals in 1997) found at Ballyhay quarry on the Awbeg, the best site for Pochard in Co. Cork.

Other important species found within the site include Long-eared Owl, which occurs all along the Blackwater River, and Barn Owl, a Red Data Book species, which is found in some old buildings and in Castlehyde, west of Fermoy. Reed Warbler, a scarce breeding species in Ireland, was found for the first time in the site in 1998 at two locations. It is not known whether or not this species breeds on the site, although it breeds nearby to the south of Youghal. Dipper occurs on the rivers.

Land use at the site is mainly centred on agricultural activities. The banks of much of the site and the callows, which extend almost from Fermoy to Cappoquin, are dominated by improved grasslands which are drained and heavily fertilised. These areas are grazed and used for silage production. Slurry is spread over much of this area. Arable crops are also grown. The spreading of slurry and fertiliser poses a threat to the water quality of this salmonid river and to the populations of E.U. Habitats Directive Annex II animal species within it. Many of the woodlands along the rivers belong to old estates and support many non-native species. Little active woodland management occurs. Fishing is a main tourist attraction along stretches of the Blackwater and its tributaries, and there are a number of angler associations, some with a number of beats. Fishing stands and styles have been erected in places. Both commercial and leisure fishing takes place on the rivers. Other recreational activities such as boating, golfing and walking are also popular. Water skiing is carried out at Villierstown. Parts of Doneraile Park and Anne's Grove are included in the site: both areas are primarily managed for amenity purposes. There is some hunting of game birds and Mink within the site. Ballyhay quarry is still actively quarried for sand and gravel. Several industrial developments, which discharge into the river, border the site.

The main threats to the site and current damaging activities include high inputs of nutrients into the river system from agricultural run-off and several sewage plants, dredging of the upper reaches of the Awbeg, over-grazing within the woodland areas, and invasion by non-native species, for example Rhododendron and Cherry Laurel.

Overall, the River Blackwater is of considerable conservation significance for the occurrence of good examples of habitats and populations of plant and animal species that are listed on Annexes I and II of the E.U. Habitats Directive respectively. Furthermore it is of high conservation value for the populations of bird species that use it. Two Special Protection Areas, designated under the E.U. Birds Directive, are also located within the site - Blackwater Callows and Blackwater Estuary. Additionally, the importance of the site is enhanced by the presence of a suite of uncommon plant species.

Appendix 3

Finding of No Significant Effects Report

FINDING OF NO SIGNIFICANT EFFECTS MATRIX	
Natura 2000 Site	Proximity of subject site to nearest point of designated site (km)
Name of project or plan	Carrigtwohill Sustainable Housing Development
Name and location of Natura 2000 site	Blackwater River (Cork/Waterford) SAC
Description of the project	Construction of 716 No. residential units with childcare facility, landscaped spaces and associated works and services.
Is the project or plan directly connected with or necessary to the management of the site?	No
Are there other projects or plans that together with the project or plan being assessed could affect the site	No
THE ASSESSMENT OF SIGNIFICANCE OF EFFECTS	
Describe how the project or plan (alone or in combination) is likely to affect the Natura 2000 site(s).	No impact is envisaged as a result of the proposed works.
List of agencies consulted: provide contact name and telephone or e- mail address.	N/A
Response to consultation.	N/A
DATA COLLECTED TO CARRY OUT THE ASSESSMENT	
Who carried out the assessment?	Ecologist with Malachy Walsh and Partners
Sources of data	Refer to references.
Level of assessment completed	Desktop study and Field Study

APPENDIX 2 – Construction Environmental Management Plan

Castlelake SHD, Carrigtwohill, Co. Cork.

Construction & Environmental Management Plan

Revision control table

Revision	Date	Issue	Prepared By	Checked By
A	23/04/2022	Review	T Finn	O Ryan
B	27/05/2022	Issue for Planning	T Finn	O Ryan

Introduction

The development will consist of the construction of a strategic housing development of 716 no. units and a 2 no. storey creche. The proposed development comprises 224 no. houses, 284 no. duplex units and 208 no. apartments. The two storey houses comprise 48 no. detached, 126 no. semi-detached and 50 no. terraced Houses containing 60 no. two bed units, 139 no. three bed units and 25 no. four bed units. The part-one to part-three storey duplex units are contained in 122 no. buildings providing 82 no. one bed units, 142 no. two bed units and 60 no. three bed units. There are 7 no. apartments blocks ranging in height from part-1 to part- 5 no. storeys.

- Block 1 is 4 no. storeys and contains 34 no. units (7 no. one bed units, 19 no. two bed units and 8 no. three bed units).
- Block 2 is part-1 to part-5 no. storeys and contains 42 no. units (15 no. one bed units, 20 no. two bed units and 7 no. three bed units).
- Block 3 is 5 no. storeys and contains 17 no. units (8 no. one bed units and 9 no. two bed units).
- Block 4 is 4 no. storeys and contains 13 no. units (6 no. one bed units and 7 no. two bed units).
- Block 5 is 4 no. storeys and contains 13 no. units (6 no. one bed units and 7 no. two bed units).
- Block 6 is 4 no. storeys and contains 13 no. units (6 no. one bed units and 7 no. two bed units).
- Block 7 is 5 no. storeys over basement and contains 76 no. units (23 no. one bed units, 41 no. two bed units and 12 no. three bed units).
- All blocks contain ancillary internal and external resident amenity space.

The proposed development also provides for: hard and soft landscaping; boundary treatments; public realm works; car parking; bicycle stores and shelters; bin stores; lighting; plant rooms; and all ancillary site development works above and below ground. The application site is positioned to the north-west of the centre of Carrigtwohill comprised of a series of land parcels with a combined area of 18.3 hectares.

This Construction Management Plan, inclusive of Environmental Management Plan, Waste Management Plan and Traffic Management Plan have been prepared and are being issued as part of Castlelake SHD planning application. These plans are working documents, but clearly outline the arrangements in place to manage the construction and environmental management aspects of this project.

These Plans will cover all our construction activities and that of its Subcontractors for the construction period.

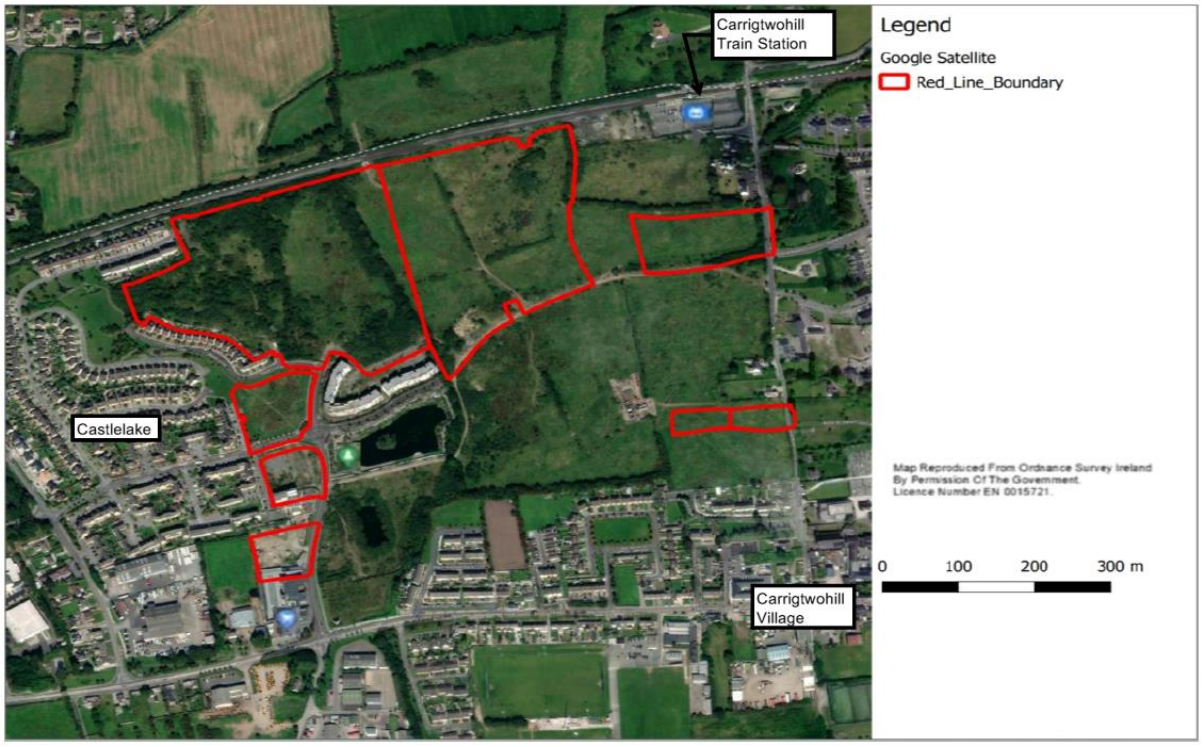
All documents are working documents and will be continually updated to reflect any changes necessary, but their authenticity will always be maintained to meet the project requirements.

Site location

The subject site is located 16km east of Cork City. It is a satellite town that has grown from a small village/hamlet situated along the side of the N25 main road between Cork and Waterford cities. The proposed development site is located circa 50m west of Carrigtwohill village. The site is bounded by agricultural lands to the North, Castlelake housing estate to the west and the Cork Road L3680 to the south. The site is accessed from the Cork Road L3680. Access is also possible from the west via the Castlelake housing estate. The N25 can be accessed to the west and east.

The proposed development bounds the Cork-Midleton Railway line to the north. Carrigtwohill train station is located to the north-east of the site. The train station serves Midleton and Cobh to the east and south and Cork to the west, with onward links to Dublin and the rest of the Country.

The new Glounthaune to Midleton Greenway will pass to the south of the site providing an alternative commuter link to Cork and Midleton and providing an amenity for existing and future residents and visitors. An east-west link road is currently nearing completion along the Southern boundary of the main land block. A north-south link road is proposed to join with an existing rail underpass.



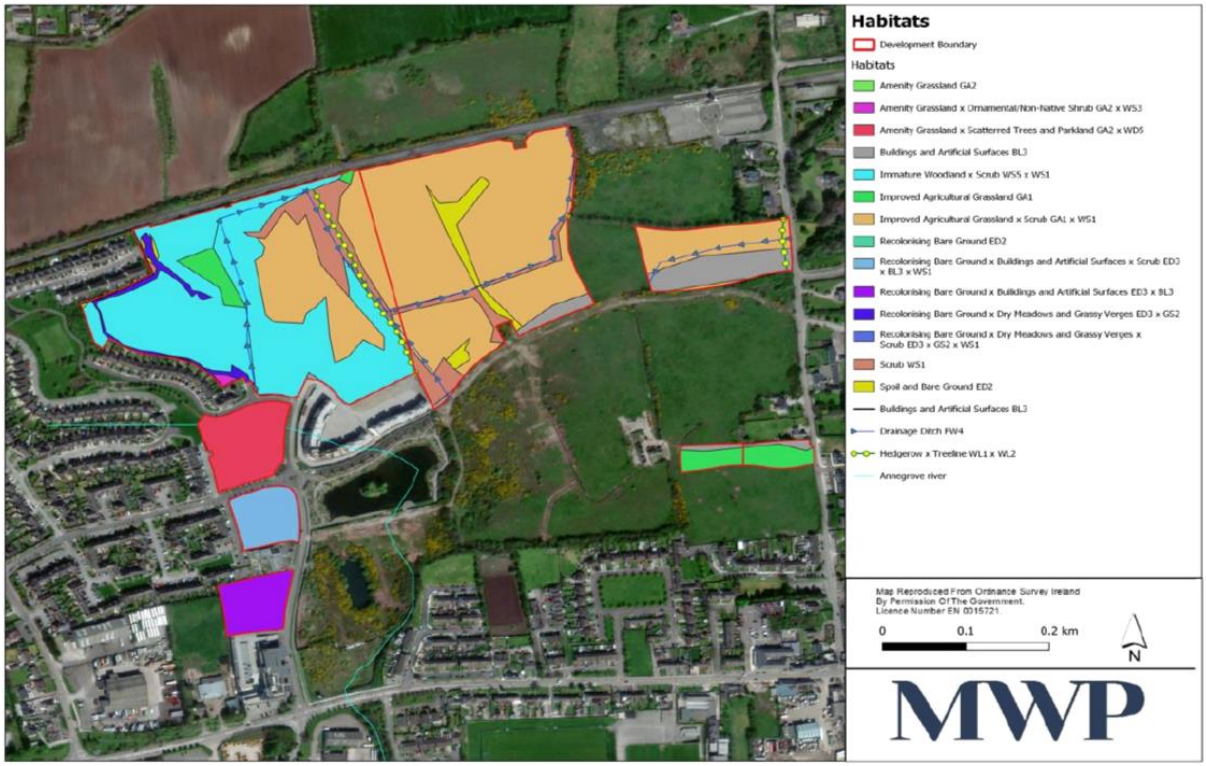
Long distant views looking south over the River Lee Valley from the top of the site.

Attractive views of the Hills north of the site, with the band of vegetation along the railway line in the mid view.

Site Description

The proposed development is relatively flat land with the highest elevation of the proposed development being ca.9m AOD. The predominant landcover at the proposed development is classified as 'agricultural Areas/Pastures' with some sections at the Southwest of the site made of 'artificial Surfaces – Discontinuous urban fabric'. Subsoil at the proposed development is classed as 'Sandstone till (Devonian' The majority of the aquifer is designated as regionally important Aquifer – Karstified (diffuse) with a section oat the northern end which is categorised as Locally Important Aquifer – Bedrock with is Moderately Productive only in Local Zones. The groundwater vulnerability of the aquifer is stated mostly as 'moderate' with small sections of the north side of the proposed development designated as 'high'.

The proposed development is located within the 'Lee, Cork Harbour and Youghal Bay' Water Framework Directive catchment (Code:19) AND THE Tibbotstown _SC_010 sub-catchment. There are a few waterbodies on site. The Woodstock Stream is the largest stream which enters the eastern most land block near Station Road and flows in a westerly direction before turning south where it flows into the Slatty Pond, which is hydrological connected to Great Island SAC and Cork Harbour SPA. Another small stream bisects the main land block and flows in a southerly direction towards the Woodstock Stream at the southwest of the site.



There are no buildings on the subject lands and are largely characterised by overgrown scrub. There are existing powerlines located on the western edge of Castlelake North.

Proposed Development Works

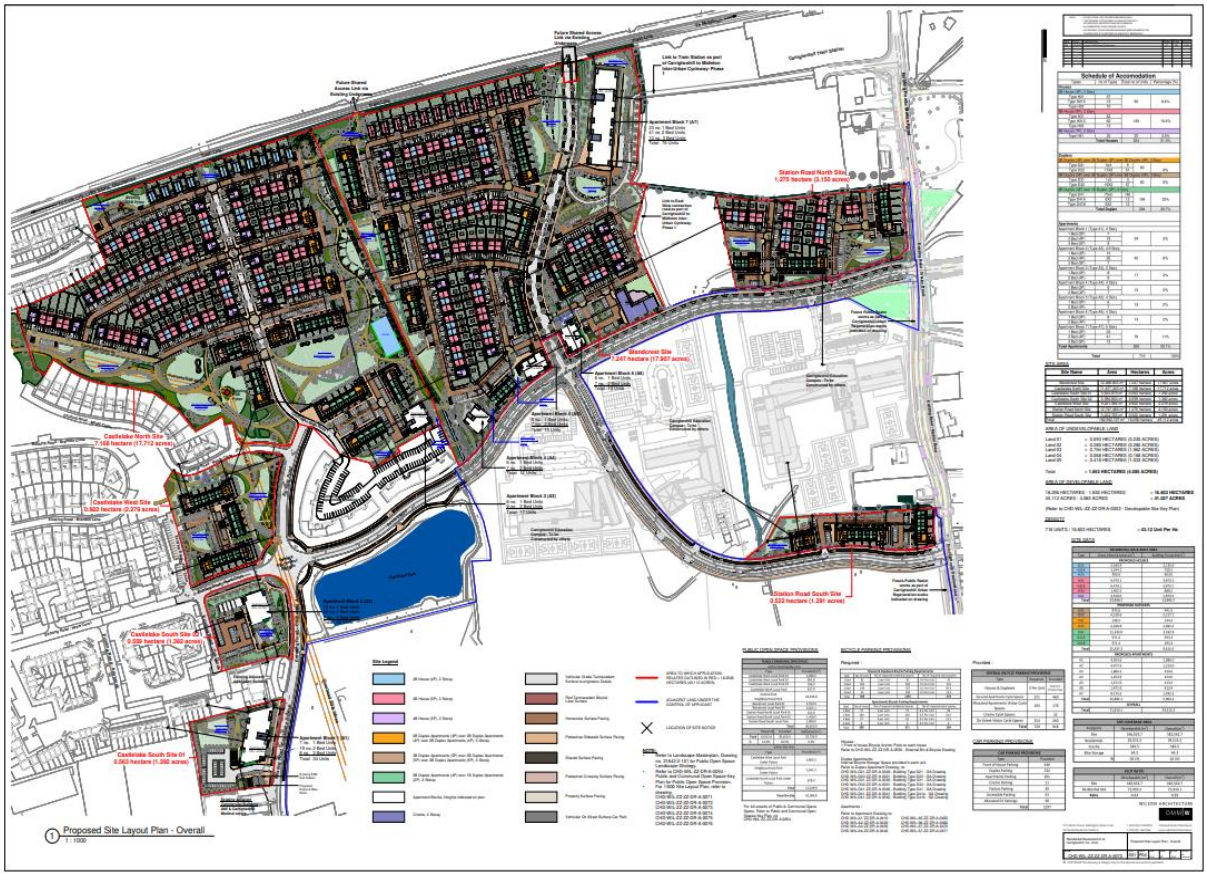
The proposed site area is 18.3 hectares. The proposed development to the East will link with the new east-west link road that connects Castlelake with Station Road and will abut the southern boundary of a significant portion of the site.

The proposed development may also benefit from the proposed Part 8 strategic cycleway scheme proposal. This scheme as proposed will provide connectivity to this proposed residential development, Carrigtwohill train station, adjacent new school development and Carrigtwohill village.

The proposed development will comprise of 224 no. houses, 284 no. duplexes and 208 no. apartments in a series of blocks ranging in height from 3-5 no. storey. In addition, the proposed development includes for a Creche and resident amenity spaces. Ancillary site works include public and communal open space, hard and soft landscaping, car parking, cycle parking, bin storage and lighting.

The proposed development is located close to established neighbourhoods with new connection points to existing local amenities through routes/walkways promoted by an active landscape scheme demonstrating the routes of individual destinations in the immediate and wider context.

The development will also complement the Carrigtwohill to Midleton Inter-Urban Cycleway Part 8 planning application that was approved on 14th March 2022.

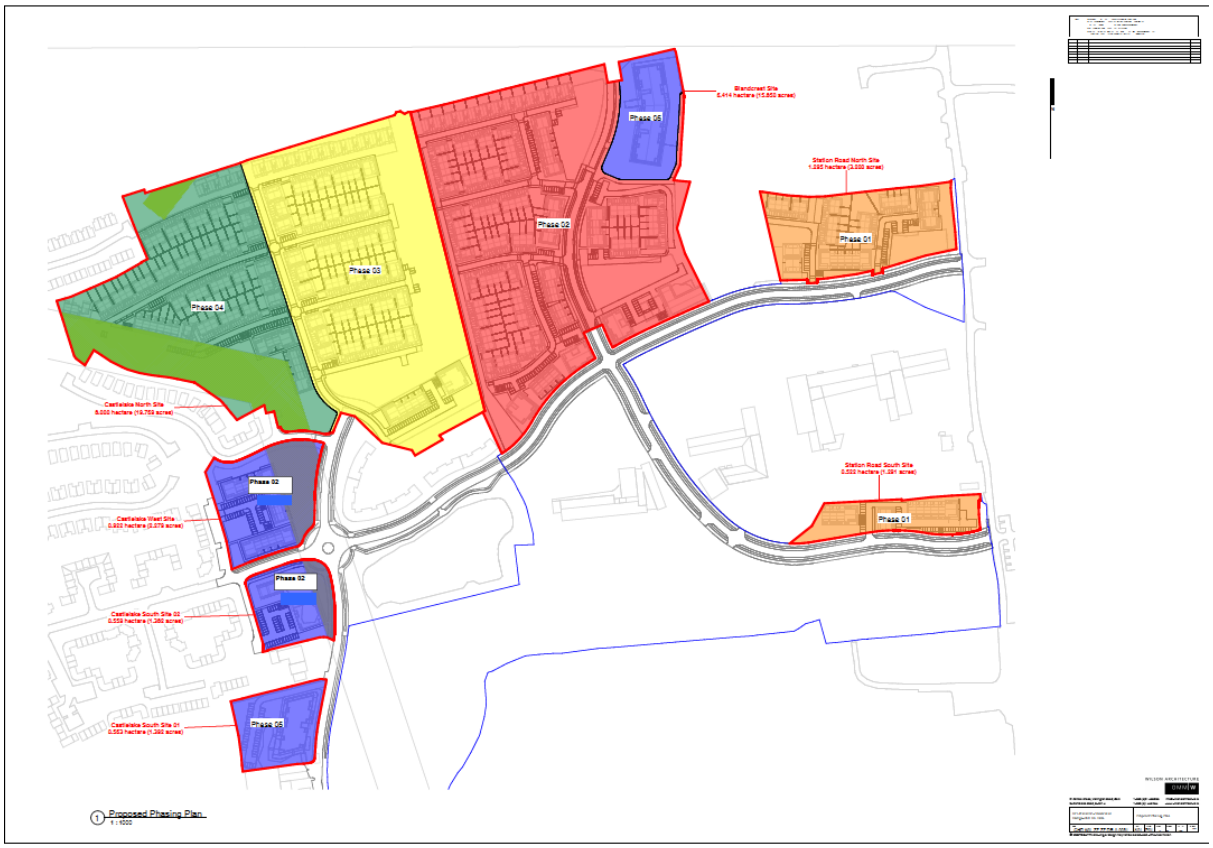


Proposed Development Layout

1.0 General Construction Works Phasing

1.1 Project Phasing Plan

The proposed works will be undertaken in several planned phases as demonstrated below. Infrastructural works required to support each element constructed will be prioritised for each phase of the development.



1.2 Construction Phase

Prior to excavation, a detail review of the final cut and fill requirements will be carried out to confirm cut and fill volumes. Detailed quantities of material to be excavated will be verified through accurate survey techniques by the groundwork's contractor at the construction phase. It is anticipated that material offsite will be minimised as levels typically are raised to protect against flood risk. Note that all imported materials will be certified accordingly for their respective use in the development.

The construction will utilise the use of both off- site and traditional building techniques in the development of each phase. Select materials as noted on planning drawings will be sourced from sustainable sources with a view to minimising waste generation on site.

Works will commence with Phase 1 of the project to the East of the Site and progress accordingly as indicated.

Material to be removed off-site will be classified in a Waste Classification Report. The classifications are 'Hazardous', 'Non-Hazardous' and 'Inert'. Material to be removed offsite will be sent either for re-use subject to appropriate authorizations or if material cannot be re-used/recovered an appropriately permitted/licensed sites will be sent for disposal. This is discussed in detail in our EMP&WMP.

2.0 Construction Management Plan

2.1 Site Access

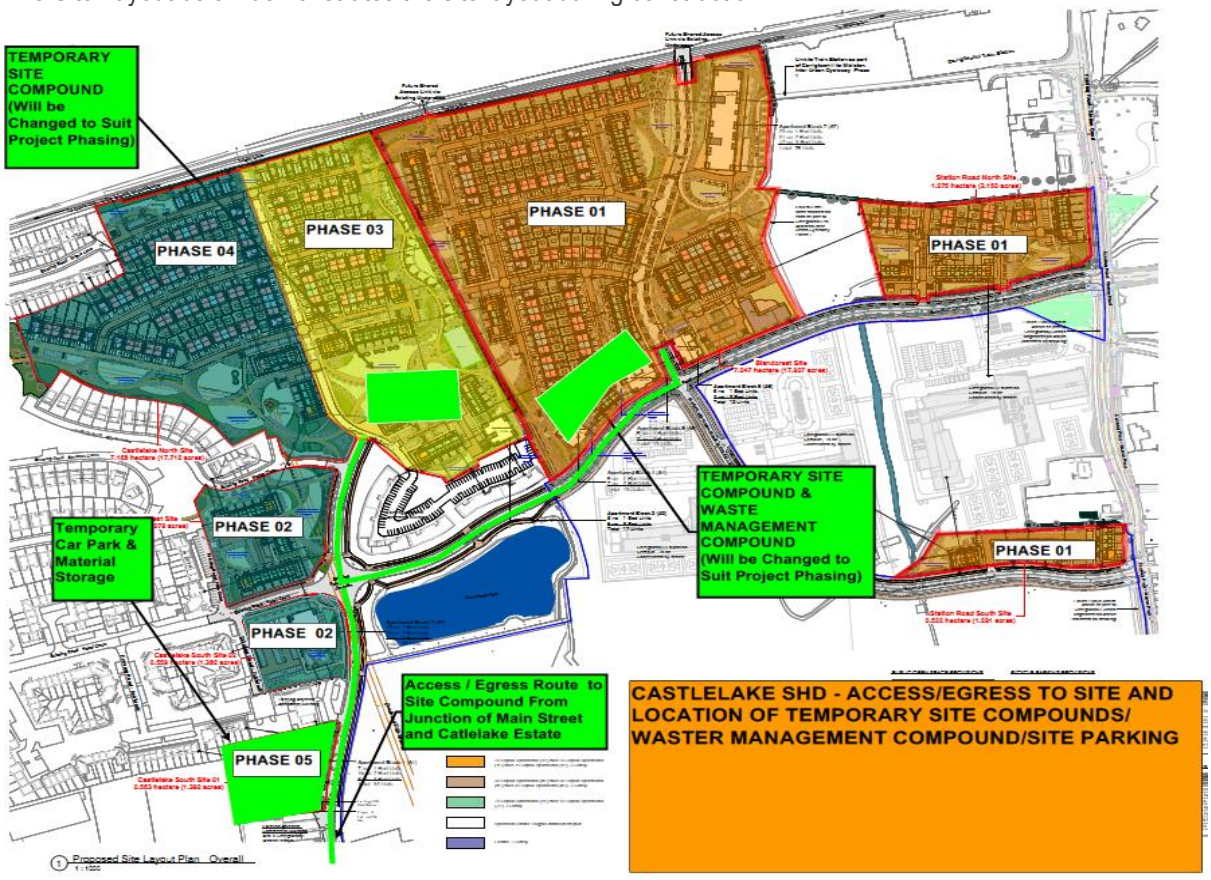
Access and egress to the development will be via the junction of Main Street and Castlelake estate in general. This will minimise the impact on Carrigtwohill village.

Appropriate operated security will be maintained at the site access gates to secure the site, to control vehicular access and to monitor and record all deliveries and removals operations.

It is expected that all vehicles will be able to drive directly into the site and turn within before exiting, limiting any potential impact on the local road network. Construction vehicle access to various phases of construction will be minimised by careful planning of the works.

Pedestrian access will be strictly controlled via manned turnstile system. Only Safe pass accredited personnel will be permitted on site and daily in-out attendance records will be maintained. Appropriate segregation will be employed on site to separate pedestrians from heavy equipment. Fenced off pedestrian walkways will be provided close to the site offices. Operatives on site will be encouraged to use public transport or cycle while temporary parking will be provided on site.

The Site Layout below demonstrates the site layout during construction.



Site layout

2.2 Site Layout & Temporary Compounds

The site layout above provides an overview of the proposed site layout to highlight proposed location of temporary site compound, waste management compound, temporary parking area and entrance and exit to the site. Note that entrances to the construction site phases will always be secured.

The Site Layout plan also denotes the location of waste materials compound on site.

Drainage within the temporary site compound will be directed to an oil interceptor to prevent pollution if any spillage occurs.

Temporary toilet facilities will be managed by the Contractor during the construction phase.

A bunded containment area will be provided within the compound for the storage of fuels, lubricants, oils etc.

The compound will be in place for the duration of the construction phase and will be removed once commissioning is complete.

2.3 Working Hours

It is envisaged that working hours during the construction process will be primarily standard working hours for the construction industry. We are conscious of our neighbours and surroundings and will mitigate against any intrusion caused by preparing specific method statements for specific works that could cause any negative impact.

The expected hours of works are:

07.00 – 19.00 Monday to Friday

8.00 – 13.00 Saturdays

No works are envisaged to be carried out on Sundays, should the need to work Sundays be required a written submission will be made to Cork County Council for permission to do so. Every effort will be made to ensure that no works are required outside of the above periods.
However, there may be some instances where this may not be possible for a variety of reasons e.g., works in the public road which are subject to restricted working times to minimise traffic impact. In such instances, specific agreement will be required from Cork County Council in advance of any such works taking place.

As part of our stakeholder management, we will minimise the effects of our operations on our neighbours and others affected by the works by regular communications on our planned activities, current progress, significant milestones, and planned activities on the project.

2.4 Soil Stockpiles

Stockpiles will be located away from drainage systems and silt retaining measures (silt fence/silt curtain or other suitable materials) to reduce risk of silt run-off shall be installed along the downgradient edges of stockpiled earth materials.

- All excavated materials from the site or introduced materials for construction will be either used or removed from the site.
- No permanent spoil or stockpiles will be left on site, other than those materials required for landscaping, berm construction and construction generally.

- Temporary storage areas for fuels and other hazardous materials required by the contractor during construction will be stored in appropriately bunded facilities to prevent the accidental spillage of hazardous liquids that could cause soil and groundwater contamination.
- Collision with oil stores will be prevented by locating oils within a steel container in a designated area of the site compound away from vehicle movements.
- Long term storage of waste oils will not be allowed on site. These waste oils will be collected in leak-proof containers and removed from the site for disposal or re-cycling by an approved service provider.
- A designated wash area for concrete trucks will be provided utilising a small bunded lined settlement area for concrete residues.

2.5 Hoarding & Signage

The initial work on site will include the erection of an appropriate security fencing around the entirety of the site to protect/secure the works and members of the public. The boundary to the site will always be maintained intact with regular recorded inspections undertaken. Adequate site security will be maintained throughout the contract period.

Note that as part of our traffic management for deliveries, all subcontractors and suppliers will be provided with a detailed route to site.

2.6 Car Parking & Mobility Plan

The provision of car parking on-site will require balanced consideration. It will be a goal throughout the project to limit the number of workers travelling to the site by car through a variety of means including:

- Promoting the use of the public transport options, particularly given the proximity of the Rail service.
- Providing an adequate amount of on-site cycle parking.
- Promoting car sharing amongst workers where feasible.

Please refer to our site layout plan for area assigned for site car parking.
In addition, subcontractors will be informed as part of their works to comply with the requirement that parking in the local streets is prohibited.

2.7 Material Deliveries & Storage

Materials will be delivered to site in a planned sequence to reduce on-site storage yet maintain the planned progress of the works. Storage of excessive materials on site will be avoided. Appropriate protection will be provided to vulnerable materials to ensure their quality is maintained when required to be used and to protect the environment. Deliveries will be co-ordinated via a booking system. On placement of orders with subcontractors/suppliers, a copy of the site traffic management plan and site rules with all be issued to facilitate a co-ordinated approach to future deliveries.

The site lies relatively close to the N25, and M8 Motorway so moving material and resources can be co-ordinated with minimum impact on local environment. It is our intention to avoid access to the site via the village centre to minimise effects on the local environment and infrastructure.

2.8 Construction Traffic

Public Road/Footpath

As noted earlier, access and egress to the development will be via the junction of Main Street and Castlelake estate. This route will minimise our impact on Carrigtwohill village. Construction traffic will access from the N25 Carrigtwohill/Cobh Cross Junction and avoid Carrigtwohill Village.

Practices will be incorporated to ensure the roads are always kept tidy, especially when earth excavation vehicles are in operation. This will be done in the form of washing truck tyres leaving the construction site and the use of road sweepers at regular daily intervals as deemed necessary.

The footpaths to Castlelake will remain unaffected but will be regularly monitored and cleaned if required.

Vehicle Management

As noted previously, it is proposed to put in place a management system at the site to control the movement of vehicles insofar as is reasonably practicable. Measures to be put in place include:

- Scheduling of heavy goods vehicles – this relates to all stages of development and includes vehicles for removing waste/spoil from the site as well vehicles making deliveries. This system will allow the number of any such vehicles arriving/departing the site during the peak hours to be limited to prevent any impact on the local road network.
- Particular effort will be directed to avoiding such movements during the morning peak hour on the network between 8AM and 9AM.
- Unscheduled vehicles in this regard will not be permitted access to the site and all contractors and sub-contractors will be informed of this through advance notice.
- Mobility management for site workers as set out previously including a series of measures to encourage and facilitate travel by alternate means.
- Informing workers and expected visitors regarding access arrangements and parking provision to ensure an appropriate mode of travel is chosen.
- Clear and appropriate signage within the site to advise of permitted routes, speed limits, safety requirements etc.

2.9 Liaison

Cork County Council relevant departments will be contacted and liaised with prior to commencement. Where necessary Road Opening Licence applications will be submitted for approval from Cork County Council. We acknowledge that many parties will have an interest in this project throughout the duration of the contract. Our presence during the construction phase will have a direct impact on the local environment, particularly concerning the following:

- Residents and landowners
- Tenants and Residents Associations
- Planning Authority
- Other Statutory Authorities
- Building Control

- Environmental
- Local Schools
- Local Business
- Local Groups
- Utility Providers
- Iarnrod Eireann

The contract manager will be responsible for project strategic liaison whilst the project manager will be responsible for day-to-day liaison and logistics for all the construction related activities.

Both will be permanently based on site with the project manager as the first point of contact for all concerns, issues, and complaints. A display board will be erected outside the site, which as minimum will identify key personnel contact addresses and telephone numbers.
If works interface with local stakeholders' workshops and forums will be held on a regular basis to maintain open relationships and keep stakeholders up to date on construction progress and its impact on all third parties.

Newsletters, liaison meetings, progress photos, organised site visits are all methods by which we can communicate how we intend to carry out the works and keep people informed

2.10 Waste Management

Its BAM's intention to ensure that all waste materials arising from the Castlelake SHD are managed and disposed of in accordance with the:

- provisions of the Waste Management Acts 1996 – 2013 and associated regulations.
- Waste Management (Hazardous Waste) Regulations.
- Movement of Hazardous Waste Regulations.
- The Carriage of Dangerous Goods by Road Act.
- (Shipment of Waste) Regulations.
- Cork County Council Waste Management Plan.
- Environmental Protection Act 1990: Waste Management, the duty of Care
- Project Specific Construction Requirements (Contract Documents); and
- the Company Environmental Management System
- Best Practice Guidelines on the preparation of waste management plans for construction and demolition waste projects
- "Changing our Ways" Waste Management Policy Statement

A specific waste management plan has been developed for this project and appended to this plan. **Refer to Appendix A.**

2.11 Environmental Management

A Construction Environmental Management Plan will be implemented for the construction process. The Environmental Management Plan will describe how we will manage environmental performance for the Castlelake SHD project. The EMP has been developed in conjunction with our overall Environmental Management System as certified to ISO 14001:2015.

The plan identifies environmental obligations, planning, compliance, targets, and control measures to ensure the purpose of the plan is met. As the works evolve, this plan will be regularly reviewed and updated to reflect works best practice. This Plan is contained in the appendices attached. **Refer to Appendix B.**

2.12 Environmental Emergency Plan

A Construction Environmental Emergency Plan has been developed for the construction process. The Environmental Emergency Plan will describe how we will manage environmental emergencies for the Castlelake SHD project, should such an unlikely event arise. The EEP has been developed in conjunction with our overall Environmental Management System as certified to ISO 14001:2015.

The plan identifies environmental emergency processes, maintains a state of preparedness and details controls required as the works evolve. Note that all such plans are regularly reviewed to ensure accurate and clear actions are available. This Plan is contained in the appendices attached. **Refer to Appendix C.**

Construction Waste Management Plan

Site Name: Castlelake SHD, Carrigtwohill, Co. Cork.

Revisions

Environmental Dept. Revision No: 01 27th May 2022			
Reason for Issue:			**Client Approval (if required)**
Originator	**Reviewer**	**Approver**	
Donal Keohane	Tim Finn	O Ryan	

Circulation

Copy	Circulation	Name	Company	Location
1	Construction Director	Ger Moloney	BAM	Little Island
2	Contract Manager	Ollie Ryan	BAM	Little Island
3	Project Manager	Tim Finn	BAM	Site
4	Engineer(s)	N/A	BAM	Site
5	General Foreman	Seamus Treacy	BAM	Site
6	Site Health, Safety & Environmental Officer	Donal Keohane	BAM	Site
7	Co. Environmental Coordinator	Elaine Maloney	BAM	Head Office, Kill

Document Control Sheet for Waste Management Plan

	Originator	Reviewer/ Approver
Name:	Elaine Maloney	Kathy O' Leary
Date:	12.02.2021	12.02.2021

Site Name	Document revised	Env Dept Rev No.	Site Rev No.	Reviewd by	Date
Castlelake SHDI	*WMP*	*Rev 10*	*Rev 00*	*HSE Officer*	*09/07/2021*

Document:	*WMP*
Site Rev No:	*00*
Changes Made:	*First Draft*
Site Reviewer:	

Document:	*WMP*
Site Rev No:	
Changes Made:	
Site Reviewer:	

Document:	
Site Rev No:	
Changes Made:	
Site Reviewer:	

Document:	
Site Rev No:	
Changes Made:	
Site Reviewer:	

TABLE OF CONTENTS

Tables

Figures

1. INTRODUCTION

This Waste Management Plan (WMP) has been developed in accordance with BAM Contractors Environmental Procedures. The controlled copy of all environmental procedures is hosted on SharePoint.

This Plan is a working document, clearly stating the arrangements in place to manage the significant environmental aspects and legal requirements of this project. This Plan covers BAM Building activities and that of its subcontractors.

This Plan has been approved by BAM HSE Department at Kill and has the commitment of the Director, Construction Directors, Contract Manager, Project Manager and Project Team to fulfil the requirements of the Plan.

1.1. Purpose of the plan

The purpose of this plan is to ensure that all waste materials arising from the *Castlelake SHD* are managed and disposed of in accordance with:

- The provisions of the Waste Management Acts 1996 – 2013 and associated regulations;
- The project specific construction requirements (Contract Documents)
- The Company Environmental Management System, and;
- Best Practice Guidelines on the preparation of waste management plans for construction and demolition waste projects.

1.2. Project description

The development will consist of the construction of a strategic housing development of 716 no. units and a 2 no. storey creche. The proposed development comprises 224 no. houses, 284 no. duplex units and 208 no. apartments. The two storey houses comprise 48 no. detached, 126 no. semi-detached and 50 no. terraced Houses containing 60 no. two bed units, 139 no. three bed units and 25 no. four bed units. The part-one to part-three storey duplex units are contained in 122 no. buildings providing 82 no. one bed units, 142 no. two bed units and 60 no. three bed units. There are 7 no. apartments blocks ranging in height from part-1 to part- 5 no. storeys.

Block 1 is 4 no. storeys and contains 34 no. units (7 no. one bed units, 19 no. two bed units and 8 no. three bed units).
Block 2 is part-1 to part-5 no. storeys and contains 42 no. units (15 no. one bed units, 20 no. two bed units and 7 no. three bed units).
Block 3 is 5 no. storeys and contains 17 no. units (8 no. one bed units and 9 no. two bed units).
Block 4 is 4 no. storeys and contains 13 no. units (6 no. one bed units and 7 no. two bed units).
Block 5 is 4 no. storeys and contains 13 no. units (6 no. one bed units and 7 no. two bed units).

Block 6 is 4 no. storeys and contains 13 no. units (6 no. one bed units and 7 no. two bed units).
Block 7 is 5 no. storeys over basement and contains 76 no. units (23 no. one bed units, 41 no. two bed units and 12 no. three bed units).
All blocks contain ancillary internal and external resident amenity space.

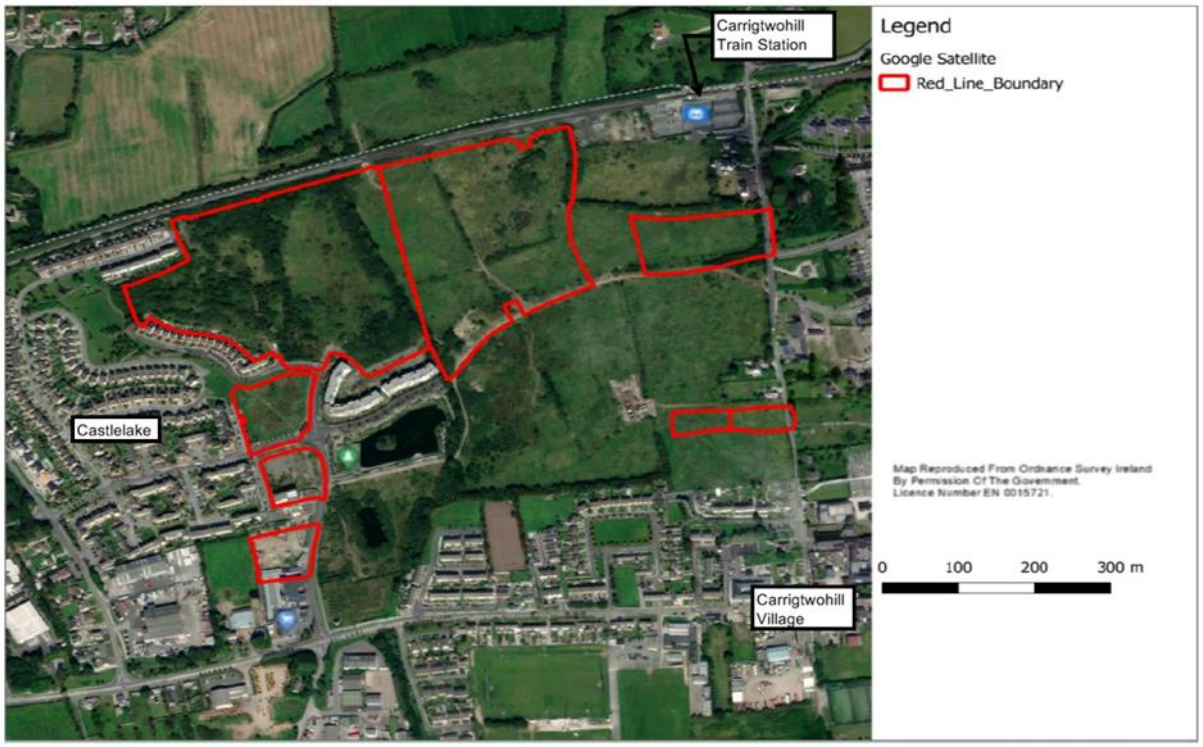
The proposed development also provides for: hard and soft landscaping; boundary treatments; public realm works; car parking; bicycle stores and shelters; bin stores; lighting; plant rooms; and all ancillary site development works above and below ground. The application site is positioned to the north-west of the centre of Carrigtwohill comprised of a series of land parcels with a combined area of 18.3 hectares.

1.3. Site location

The subject site is located 16km east of Cork City. It is a satellite town that has grown from a small village/hamlet situated along the side of the N25 main road between Cork and Waterford cities. The proposed development site is located circa 50m west of Carrigtwohill village. The site is bounded by agricultural lands to the North, Castlelake housing estate to the west and the Cork Road L3680 to the south. The site is accessed from the Cork Road L3680. Access is also possible from the west via the Castlelake housing estate. The N25 can be accessed to the west and east.

The proposed development bounds the Cork-Midleton Railway line to the north. Carrigtwohill train station is located to the north-east of the site. The train station serves Midleton and Cobh to the east and south and Cork to the west, with onward links to Dublin and the rest of the Country.

The new Glounthaune to Midleton Greenway will pass to the south of the site providing an alternative commuter link to Cork and Midleton and providing an amenity for existing and future residents and visitors. An east-west link road is currently nearing completion along the Southern boundary of the main land block. A north-south link road is proposed to join with an existing rail underpass.



Carrigtwohill SHD, Carrigtwohill, Cork

1.4. Working hours

Working hours will be in accordance with the Planning Conditions and Environmental Legislation. The expected hours of works are:

07.00 – 19.00 Monday to Friday

8.00 – 13.00 Saturdays

1.5. Plan objectives

The objectives of this Plan are to detail:

- Wastes arising from the substructure works and waste construction materials.
- Methods and locations used for their handling and storage on site, including a site map showing waste management areas (in **Appendix A**)
- Waste Collection Permits required for the removal of waste from site
- The disposal facilities for the waste streams and their associated Waste License or Permit.

1.6. Update and review

This plan will be updated at a minimum of six-monthly intervals unless significant changes take place in works being undertaken on site.

2. RECYCLING/WASTE MANAGEMENT STRATEGY

2.1. Recycling/Waste management goal

The recycling/waste management goal for the Project is to manage all waste in accordance with the relevant statutory provisions and the waste hierarchy:

The waste management strategy for the Project will follow the accepted waste hierarchy.

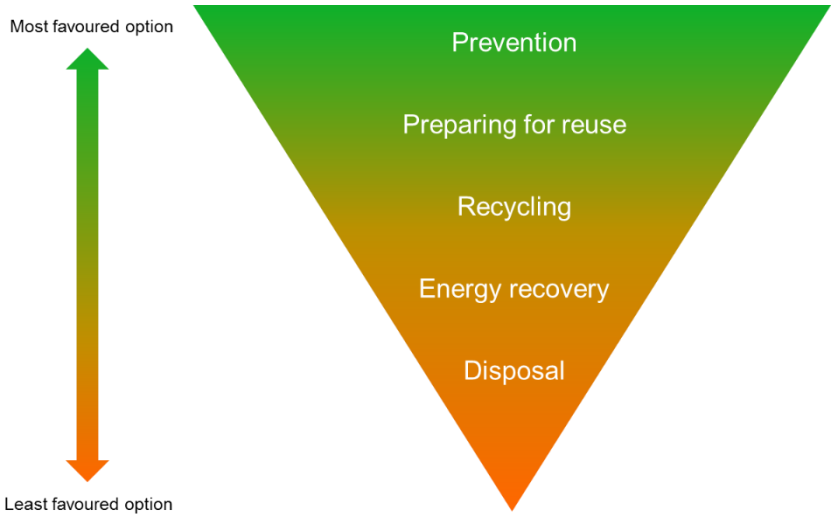
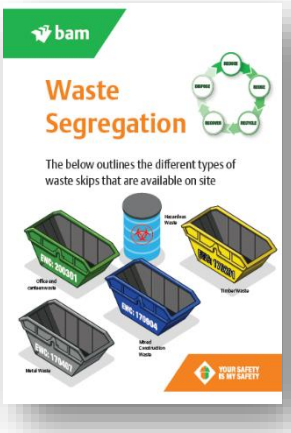


Figure 1: Waste management hierarchy

The waste management goals will include:

- Whenever possible materials for construction activities will be ordered as to prevent the minimum storage time and kept in the storage area before release to site for use.
- Materials will be ordered, where possible, in sizes to prevent wastage e.g. in form of offcuts and waste to be able to be returned to the original supplier (eg plastic pipe)
- Materials delivered to the project will be received and controlled by the Stores Manager (or similar). Materials will be stored to minimise the potential of damage or wastage. Measures will include off-ground storage (eg on pallets), remaining in original packaging, protection from rain damage or collision by plant or vehicles
- The materials storage area will be secured during out of hours to prevent unauthorised access
- A waste management compound will be set up to handle incoming waste from construction activities. This will be designed to facilitate the segregation of key waste streams to maximise the opportunity to re-use, recycle and return wastes generated on site



- The segregated waste will be placed in skip containers. Waste will be placed in the skips in such a way to minimise 'empty' void space.
- Skips will be labelled to clearly highlight waste stream for each skip. As a minimum skips and containers will be provided for segregating of the following key waste streams:

Mixed Metal	Timber	General/Mixed C&D	Packaging (Plastic & Cardboard)	Hazardous

- Hazardous waste will be kept in a secure area away from other wastes to ensure no contamination takes place
- Separate areas within the waste compound will also be allocated for the storage of plastic piping awaiting return to supplier, waste tyres and WEEE (where applicable). The layout of the waste compound will be provided in Appendix 1 of the contract-stage version of this Plan.

Waste and recycling targets

Waste and recycling targets will be to achieve:

- 100% recycling of surplus reinforcement where possible
- Reuse of all earthworks materials on site – zero export where possible (excluding contaminated materials)
- No contamination of skips – no additional costs due to inappropriate materials being placed in skips designated for particular waste streams.
- 15% reduction of total construction waste (relative to total revenue over 5 years) compared to 2020.
- Achieve >98% recovery rate for all C&O waste.
- ≤ 9.0t C&D waste generated per 100m² (gross internal floor area) *Target only applicable to building sites.

2.2. How we will achieve our targets

The waste management goal will be achieved through the implementation of several guiding principles in accordance with the waste hierarchy, namely:

- Giving preference to the purchase of materials with minimum packaging
- Storing materials in designated areas and separate from wastes to minimise damage
- Establishing take back schemes and returning packaging and unused materials to the suppliers where possible
- No pallets to be placed in skips on site
- Maximising the reuse of soils and rock on site during the construction of the Project
- Segregating construction and demolition wastes into reusable, recyclable and non-recyclable materials
- Reusing and recycling materials on site during construction where practicable

- Recycling other recyclable materials through appropriately permitted/licensed contractors and facilities
- Disposing of non-recyclable wastes to licensed landfills.

2.3. Waste license/permit requirements

The following statutory restrictions apply with regard to the collection and treatment of waste in Ireland:

2.3.1. Waste Management (Collection Permit) Regulations 2008

- All types of waste may only be collected and transported from site by a contractor who holds a National Waste Collection Permit for the type of waste being collected
- Waste will only be disposed of or recovered at a site which holds a Licence or Permit under the Waste Management (Facility, Permit and Registration) (amend) Regs 2014
- We must obtain a copy of the 'end disposal site' Licence or Permit for the waste we are disposing of
- Copies of all relevant licenses and permits will be kept on site and attached to this plan in Appendix 2, namely waste collection permits and waste facility permits.

2.3.2. Waste Management (Hazardous Waste) Regulations 1998

- Hazardous waste removed from site must be accompanied by a Waste Transfer Form (WTF) as per European Communities (Shipments of Hazardous Waste Exclusively within Ireland) Regulations 2011
- Hazardous waste to be removed from Ireland for treatment elsewhere must be accompanied by a Transfrontier Shipment Form in accordance with the Waste Management (Shipment of Waste) Regulations 2007.

2.4. Hazardous wastes management

Hazardous wastes pose a risk to the health and safety of personnel as well as the environment. The Site Safety, Health & Environmental Officer should be notified of any hazardous waste or suspected hazardous waste, and consulted for assistance with handling procedures. Under the health and safety plan risk assessments and procedures are available for:

- Excavating in Contaminated Ground (PRA31-1)
- Buried asbestos in landfill (JSRA 31-2)
- Removing asbestos from existing buildings (PRA24-1)
- Environmental Bulletins 16 & 19 'Asbestos Removal' to be adhered to.

2.5. Duty of care

Responsibility for waste management lies with the principal contractor unless a contractual agreement with subcontractors to manage their own waste arisings exists.

3. WASTE IDENTIFICATION AND MANAGEMENT

3.1. General

Castlelake SHD will provide a dedicated waste handling and segregation area as shown on the site map in **Section 8** of this document.

Waste segregation should occur where possible.

The Site Agent/Foreman will:

- Oversee all waste handling operations
- Regularly check skips to ensure correct segregation has been achieved, void space is minimised and that no contamination has taken place
- Ensure the compound is kept tidy and in good appearance at all times
- Order and change skips as required.

Each waste skip and bin will be clearly labelled as to the type of waste contained.

3.2. Waste procedures

3.2.1. Excavation waste

There will be a certain amount of excavated materials re-used as fill. Any remaining material will be removed offsite via a licenced haulier to a licenced facility/ tip.

3.2.2. Demolition waste

N/A

3.2.3. Office waste

Office waste will be removed offsite via licenced carrier to a licenced waste facility.

3.2.4. Construction waste

Construction waste will be removed by licenced carrier to licenced waste facility. Expected wastes include general waster, timber and metal.

3.2.5. Hazardous waste

Not expected but should the need arise, any such waste will be removed via licenced carrier to licenced waste facility.

4. WASTE CONTRACTORS

Table 1: Waste contractors

Type		EWC code	Name of waste contractor	National Waste Collection Permit (NWCPO) No.	Waste Facility Permit No/ Waste Licence No./ COR No
Office/ canteen Waste Contractor(s)		200301	Greenstar	NWCPO-13-11193-06	WFP-CC-38-2020
C&D Waste Contractors(s)		170904	Greenvalley	NWCPO-14-11381-02	WFP-CK-20-0210-01
Excavated Waste Contractors(s)		170504	Greenvalley	NWCPO-14-11381-02	WFP-CK-20-0210-01
Hazardous Waste Contractors(s)	Asbestos	170605			
	Oil & Spill Kit Material	150202			
Recyclables/Mixed Waste Contractor(s)	Packaging	150106	Greenstar	NWCPO-13-11193-06	WFP-CC-38-2020
	Plastic	170203	Greenstar	NWCPO-13-11193-06	WFP-CC-38-2020
	Timber	170201	Greenstar	NWCPO-13-11193-06	WFP-CC-38-2020
	Metal	170407	Cork Metal	NWCPO-12-6-11798-01	WFP-CC-22/2019
	Gypsum	170802			
	Other (Specify)				

** Note all waste contractors must be included (e.g. excavated material, skip hire, port-a-loos, canteen waste, roadsweepings, office waste, hazardous waste).*

5. WASTE VOLUMES

5.1. Company reporting

BAM requests all waste contractors to submit waste reports to the Environmental Coordinator on a quarterly basis. Waste statistics are then compiled in accordance with the Company Corporate Social Responsibility (CSR) requirements, which has been developed in accordance with the Global Reporting G4 standard, Greenhouse Gas Protocol and CDP questionnaire. Under the reporting requirements, waste contractors issue reports detailing the volumes of waste generated and the waste destination for their sites.

5.2. Site reporting

The *Carrigtwohill SHD* site will maintain a waste log of all waste removed from site to ensure all movements are recorded on site for Local Authority Inspections. The waste log will contain the following information:

- Date of collection
- Waste description (as per the *List of Waste/European Waste Catalogue (EWC)*)*
- Name of waste collector/haulier and National Waste Collection Number (NWCP)
- Destination of waste and Facility Permit/Licence Number
- Weight.

6. COMMUNICATION AND RESPONSIBILITY

6.1. Communication

All employees and contractors are required to undertake a site induction prior to conducting any work on site. At this induction the waste management goals and strategy will be made clear and the employees will be made aware that they are responsible for ensuring the management of waste in accordance with this management plan. Three Toolbox Talks on environmental and waste issues will be conducted quarterly. For further details refer to the *Environmental Management Plan*.

Progress on the implementation of the waste management plan will be communicated to staff at the monthly safety meeting and at internal progress meetings.

6.2. Cost tracking

The Quantity surveyor is responsible for tracking the costs associated with the implementation of the waste management plan. It is essential that waste costs are communicated back to personnel, particularly if additional charges are incurred due to contamination of skips with other wastes.

6.3. Responsibilities

The Project Manager is responsible for the implementation of this Waste Management Plan and for ensuring that activities on site comply with the requirements of the Waste Management Acts, 1996 to 2013 and associated regulations.

All site engineers and foreman will be responsible for monitoring the implementation of this management plan through regular site inspections. Monitoring should be recorded on the relevant checklists (refer to Section 7).

Table 2: Responsibilities

Task	Frequency	Responsible	Name and number
WMP implementation	Ongoing	Project Manager or Foreman	Tim Finn 0872515742
Tracking costs	Ongoing (updated monthly)	Project Manager or Foreman	Tim Finn 0872515742
Notification of skip contamination	At least weekly	Project Manager or Foreman	Tim Finn 0872515742
Inspections of skips, maintenance of skip area	At least weekly	Project Manager or Foreman	Tim Finn 0872515742
Order and exchange skips	As required	Project Manager or Foreman	Tim Finn 0872515742

Task	Frequency	Responsible	Name and number
Monitoring waste management implementation	Ongoing	General Foreman/ Site Safety, Health & Environmental Officer	Tim Finn 0872515742 Donal Keohane
Issuing warning for illegal dumping in skips	As required	General Foreman	TBC
Liaising with Client, neighbours, other contractors and regulatory bodies	As required	Project Manager	Tim Finn 0872515742
Return printer / copier cartridges	As required	Site Administrator / Receptionist	N/A
Provide advice on hazardous waste handling and disposal	Ongoing	Environmental Coordinator	EM
Undertaking toolbox talks on waste procedures	Three per quarter	Site Safety, Health & Environmental Officer	Donal Keohane
Keeping records (eg checklists)	Weekly	Site Safety, Health & Environmental Officer	Donal Keohane
Completing hazardous waste consignment note	As required	Specialist Hazardous Waste Contractor	N/A
Internal audit	Quarterly	BAM Environmental Coordinator & Site Safety, Health & Environmental Officer	EM/ CW/DK

7. MONITORING AND AUDIT

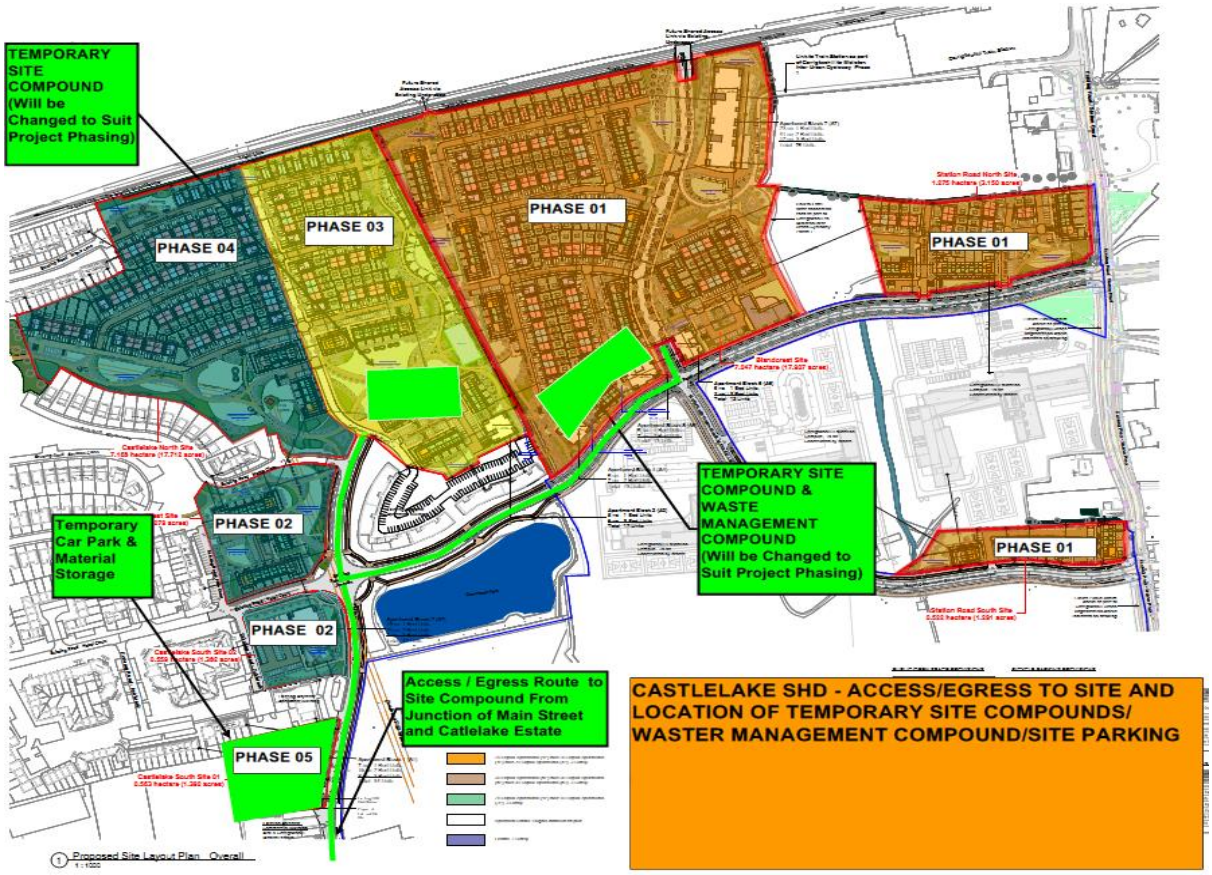
Monitoring of the waste management plan will be undertaken at various levels. The Project Manager (or similar) is responsible for tracking quantities of material sent for recycling, recovery or disposal and costs associated with each waste stream.

Monitoring the on-site implementation of waste handling procedures shall be undertaken by the General Foreman on an ongoing basis and should be reported weekly as part of the Foreman's Weekly Safety & Environment checklist. Monitoring of the skips in the main compound is undertaken by the Stores Manager or General Foreman as detailed before, and this is checked by the Safety, Health & Environmental Officer once a week as part of the general environmental inspection. Inspection reports are kept in a file on site by the Site Safety, Health & Environmental Officer. In consultation with the Site Safety, Health & Environmental Officer the General Foreman shall be responsible for any action required as a result of the weekly inspection to ensure compliance with the waste management procedures.

An audit of the waste management plan and procedures will be conducted by the Environmental Coordinator at three to six month intervals, as specified in the Site EMP.

8. APPENDIX 1. SITE MAP (SHOWING WASTE STORAGE AREAS)

On site in compound – changes through whiteboard meetings to be updated on site.



9. APPENDIX 2. WASTE LICENCES AND PERMITS

Will be located on site on site start up.

10. APPENDIX 3. WASTE CONTRACTOR CHECKLIST

Table 4. Waste contractor checklist

Question	Yes	No
Do you have a Waste Collection Permit (WCP) for EVERY Waste Contractor that collects ANY waste from the site (full copies including Appendices A, B, C & D)	✔	
Is the waste contractor permitted to collect the type of waste in question? Is the specific waste type being collected detailed in the waste collection permit?	✔	
Have you contacted the waste contractor and asked what licensed/ permitted facility our waste is being brought to?	✔	
Is this licensed/ permitted facility stated in the waste collection permit? If not, the waste contractor should be contacted and asked.	✔	
Have you checked the waste facility permit/ license to see if they can accept the waste in question? (It is very important to check this if the waste is hazardous)	✔	
Have you checked the waste transfer notes comply with EA-20 and EA-39 on Waste Transfer Notes	✔	
Have waste transfer forms been obtained for all hazardous waste removed off site?	✔	
Have waste export certificates (if applicable) been obtained for any hazardous waste shipped outside of the Republic of Ireland?		No
Have destruction certificates been obtained for all hazardous waste removed off site?		No

11. APPENDIX 4. DEFINITIONS

Re-use

Products or components that are not waste are used again for the same purpose for which they were conceived.

Recycling

Any recovery operation by which waste materials are reprocessed into products, materials or substances.

Recovery

Any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfill a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy.

Disposal

Any operation which is not recovery even where the operation has as a secondary consequence the reclamation of substances or energy. Annex I sets out a non-exhaustive list of disposal operations.

Inert Waste

Waste that;

- Does not undergo any significant physical, chemical or biological transformations,
- Will not dissolve, burn or otherwise physically or chemically react, biodegrade or adversely affect other matter, or be adversely affected by other matter, including waters, with which it comes into contact in a way that causes or is likely to cause environmental pollution, or
- Will not endanger the quality of surface water or groundwater.

Hazardous Waste

Waste which displays one or more of the hazardous properties listed below:

- Explosive
- Oxidizing
- Highly flammable (liquids, substance, solid liquid, gaseous substance)
- Flammable liquid substances
- Irritant
- Harmful
- Toxic
- Carcinogenic
- Corrosive
- Infectious
- Toxic for reproduction

- Mutagenic
- Waste which releases toxic or very toxic gases in contact with water, air or an acid
- Sensitizing substances
- Eco-toxic
- Waste capable by any means, after disposal, of yielding another substance, e.g. a leachate, which possesses any of the characteristics listed above.

12. APPENDIX - COVID 19 WASTE MANAGEMENT

Waste from a suspected case, the disposal of their PPE and the disposal of waste from cleaning the contaminated area cloths/mop heads etc

1. Waste should be placed in a plastic bag and sealed.

2. The plastic bag should then be placed in a second bag, which is then tied, and the date is labelled on the bag.

3. The waste must be stored safely and left for 72 hours.

4. Dispose of the waste as normal once the time has passed.

5. Ensure closed top pedal bin is in place in the isolation area.

6. The first aiders disposable PPE (apron, gloves etc) should also be removed as outlined above.

7. Arrangements to be made for the regular and safe emptying of bins.

In general, ensure enough bins are provided with regular removal and disposal, Dispose of used wipes/tissues/cleaning materials in a designated bin/sealed bag. Touch free bins to be provided where practical. Currently all other waste is to be disposed as usual. Refer to the BAM Good Practice Guide.

Environmental Management Plan

Site Name: Castlelake SHD, Carrigtwohill, Co. Cork.

Revisions

Environmental Dept. Revision No: 02 1st June 2022			
Reason for Issue:			**Client Approval (if required)**
Originator	**Reviewer**	**Approver**	
Donal Keohane	Tim FInn	Ollie Ryan	

Circulation

Copy	Circulation	Name	Company	Location
1	Construction Director	Ger Moloney	BAM	Little Island
2	Contract Manager	Ollie Ryan	BAM	Little Island
3	Project Manager	Tim FInn	BAM	Site
4	Site Agent	TBC	BAM	Site
5	General Foreman	Seamus Treacy	BAM	Site
6	Site Health, Safety & Environmental Officer	Donal Keohane	BAM	Site
7	Co. Environmental Coordinator	Elaine Maloney	BAM	Head Office, Kill

Document Control Sheet for Environmental Management Plan

	Originator	Reviewer/Approver
Name:	Elaine Maloney	Kathy O'Leary
Date:	12.02.2021	12.02.2021

Site Name:	Document revised:	Env. Dept Rev No:	Site Rev. No:	Reviewed by:	Rev Date
Castlelake SHD	*EMP*	*EMP Rev 13*	*Site Rev 00*	*HSE Officer*	*1-5-22*

Document:	*EMP*
Site Rev No:	*Rev 00*
Changes Made:	*First Draft*
Site Reviewer:	

Document:	*EMP*
Site Rev No:	
Changes Made:	
Site Reviewer:	

Document:	
Site Rev No:	
Changes Made:	
Site Reviewer:	

Document:	
Site Rev No:	
Changes Made:	
Site Reviewer:	

Document:	
Site Rev No:	
Changes Made:	
Site Reviewer:	

TABLE OF CONTENTS

Tables

Figures

1. INTRODUCTION

This Environmental Management Plan (EMP) has been developed in accordance with BAM Contractors Environmental Procedures. The controlled copy of all environmental procedures is hosted on SharePoint.

This Plan is a working document, clearly stating the arrangements in place to manage the significant environmental aspects and legal requirements of this project. This Plan covers BAM Building activities and that of its subcontractors.

This Plan has been approved by BAM HSE Department at Kill and has the commitment of the Project Director, Project Manager and Project Team to fulfil the requirements of the Plan.

1.1. Purpose of the plan

This EMP describes how BAM will manage environmental performance for the Castlelake SHD Project.

This EMP has been developed within the framework of the BAM Contractors EMS. The BAM Contractors EMS is certified to ISO 14001:2015.

This Plan will:

- Identify the environmental obligations and the hazards and risks associated with the Castlelake SHD construction activities
- Assist in the prevention of unauthorised environmental harm
- Fulfil the environmental requirements as defined in the contract.
- Minimise potential impacts on the community that relate to the environmental aspects from BAM's construction activities.

1.2. Project description

The development will consist of the construction of a strategic housing development of 716 no. units and a 2 no. storey creche. The proposed development comprises 224 no. houses, 284 no. duplex units and 208 no. apartments. The two storey houses comprise 48 no. detached, 126 no. semi-detached and 50 no. terraced Houses containing 60 no. two bed units, 139 no. three bed units and 25 no. four bed units. The part-one to part-three storey duplex units are contained in 122 no. buildings providing 82 no. one bed units, 142 no. two bed units and 60 no. three bed units. There are 7 no. apartments blocks ranging in height from part-1 to part- 5 no. storeys.

Block 1 is 4 no. storeys and contains 34 no. units (7 no. one bed units, 19 no. two bed units and 8 no. three bed units).

Block 2 is part-1 to part-5 no. storeys and contains 42 no. units (15 no. one bed units, 20 no. two bed units and 7 no. three bed units).

Block 3 is 5 no. storeys and contains 17 no. units (8 no. one bed units and 9 no. two bed units).

Block 4 is 4 no. storeys and contains 13 no. units (6 no. one bed units and 7 no. two bed units).

Block 5 is 4 no. storeys and contains 13 no. units (6 no. one bed units and 7 no. two bed units).

Block 6 is 4 no. storeys and contains 13 no. units (6 no. one bed units and 7 no. two bed units).

Block 7 is 5 no. storeys over basement and contains 76 no. units (23 no. one bed units, 41 no. two bed units and 12 no. three bed units).

All blocks contain ancillary internal and external resident amenity space.

The proposed development also provides for: hard and soft landscaping; boundary treatments; public realm works; car parking; bicycle stores and shelters; bin stores; lighting; plant rooms; and all ancillary site development works above and below ground. The application site is positioned to the north-west of the centre of Carrigtwohill comprised of a series of land parcels with a combined area of 18.3 hectares.

1.3. Working hours

Working hours are in accordance with the Planning Conditions and Environmental Legislation. The expected hours of work are Monday to Friday 07:00 – 19:00hrs and on Saturdays 08:00 – 13:00hrs.

1.4. Plan objectives

The objectives of this EMP are to:

- Act as a continuous link and reference document for environmental issues between the design, construction, testing and commissioning stages of the Project
- Demonstrate how construction activities and supporting designs will properly integrate the requirements of environmental legislation, planning consent conditions, policy, good practice, and those of the environmental regulatory authorities and third parties
- Record environmental risks and identify how they will be managed during the construction period
- Record the objectives, commitments, and mitigation measures to be implemented together with programme and date of achievement

- Identify key staff structures and responsibilities associated with the delivery of the Project and environmental control and communication and training requirements as necessary
- Describe the proposals for ensuring that the requirements of the environmental design are achieved, or are in the process of being achieved, during the contract period
- Act as a vehicle for transferring key environmental information at handover to the body responsible for operational management. This will include details of the asset, short and long-term management requirements, and any monitoring or other environmental commitments
- Provide a review, monitoring and audit mechanism to determine effectiveness of, and compliance with, environmental control measures and how any necessary corrective action will take place.

1.5. Review and update

This plan will be updated at a minimum of six-monthly intervals unless significant changes take place in works being undertaken on site

2. ENVIRONMENTAL MANAGEMENT SYSTEM

2.1. Project organisation

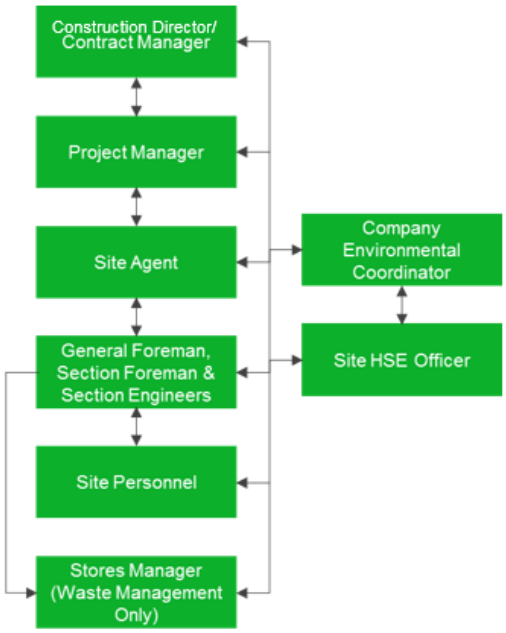


Figure 1: Environmental organisation chart

2.2. Communication

The principal lines of internal communication in relation to the EMP are shown above. Environmental issues are communicated to staff through the site induction, toolbox talks and HSE meetings.

Communication with other external parties will be in accordance with the consultation requirements (Section 6) and in response to complaints (Section 3).

2.3. Responsibilities

Table 1: Roles and responsibilities

Name	Initials	Company	Role (Job title)	Environmental management responsibilities
Elaine Maloney	EM	BAM	Company Environmental Coordinator	• Advises on environmental issues and controls, and conducts internal environmental audits.
		BAM	Construction Director/Contracts Manager	• Approves and implements EMP.
		BAM	Project Manager/Site Agent	• Monitors implementation of control measures, ensures that activities, including subcontractor activities, comply with the requirements of the relevant performance requirements.
		BAM	Site Safety, Health Environmental Officer	• Conducts weekly environmental checks and raises any non conformances with site management. • Carries out toolbox talks on environmental issues. Coordinates emergency response, including spills. • Checks spill kits and orders spill control materials when required. • Ensures the Environmental documentation is kept up to date in line with current works and is circulated. • Ensures Safety Data Sheets are communicated with users. • Coordinates water/noise/dust monitoring and remedial actions
		BAM	Site Engineer	• Ensures that works are carried out in accordance with the EMP and with the approved works method statement.
(Various)		BAM	Foremen/Supervisors	• Carrys out toolbox talks • Ensures compliance with water/noise/dust monitoring and remedial actions • Ensures that works are carried out in accordance with the EMP and with the approved works method statement • Performs weekly environmental inspections.
		BAM	Quantity Surveyors	• Tracks the costs associated with the implementation of environmental matters and forwards to the Company Environmental Coordinator as required.

3. ENVIRONMENTAL MANAGEMENT ARRANGEMENTS

3.1. Environmental management

The environmental management system (EMS) complies with the ISO 14001:2015 standard. Those aspects of the EMS relevant to this Project are outlined in this document which also contains references to specific procedures.

3.2. Planning

The environmental planning for the project is based on information from:

- The clients project information and tender documentation
- Local Authority Planning Permission
- Appropriate Assessments

Such information has been used in the environmental assessment of the activities for this project.

3.2.1. Monitoring and checking

The significant environmental aspects of the project are monitored regularly by carrying out the following at the frequency stated below:

Table 2: Monitoring and checking

Monitoring and Checking	Frequency
Environmental Inspections by Project Managers	Monthly
Environmental Inspection by Foremen	Weekly
Environmental Audits by Env Co-ordinator	Quarterly/6monthly
Surface Water Inspections (recorded)	*As required when working on or around existing watercourses*
Surface water inspection (visual)	*Daily*
Noise and Vibration Monitoring (where applicable)	*N/A*
Dust Monitoring (visual)	*As required*
Permit to pump water in use (where applicable)	*As required.*

3.2.2. Action register

A record of environmental management actions is to be kept on site. The progress for all actions is reported regularly to the appropriate member of the Management Team. Such actions will include information taken from:-

- Environmental inspections
- Audit actions: non-conformances and observations
- Progress of actions following environmental incidents
- Significant communications with stakeholders
- Project issues requiring management action
- Complaints

These actions will be added to the action register, closed out in the suitable timeframe by the appropriate person.

3.2.3. Performance

Environmental Performance of the project is monitored by:

- Environmental review meetings as a part of the Monthly HSE Meetings
- Site inspections
- Audits conducted by the HSE Department, by external organisations or by the Client
- A review of the quantities of waste created
- External communications and feedback
- Review of objectives and targets (targets table Section 7)
- Sustainability (CSR) reporting

3.3. Communications

3.3.1. Environmental complaints

All environmental complaints will be recorded in the project Complaints Register. The Register is maintained on site by a nominated member of the Management Team who also allocates responsibility for resolving any issues and follows up complaints to ensure they are resolved. Any issues that are deemed to be significant will be reported to the Site Management Team and the relevant authorities as appropriate. Complaints are reviewed during internal audits by the Environmental Coordinator, where any additional measures to improve performance are discussed. Complaints are reported to Head Office also. See EP-24 Complaints Procedures for more details.

All complaints received from external sources and incidents must be reported to the Project Manager

Environmental incidents

Environmental incidents are categorised in terms of major or minor.

Major environmental incident is any situation which has resulted in significant pollution requiring high levels of resources for response and remedy and must therefore

be reported to Site/Company Management, the Client and or any relevant statutory authority.

Minor environmental incident is any situation which has resulted in environmental pollution which required minimal action to aid recovery from Site/Company Management. Non reportable to the Client and/or any relevant statutory authority unless this requirement is stated elsewhere.

Refer to Environmental Procedures EP-06 and EP-24 for more details.

The Site Team will:

- Inform relevant person(s) on site
- Report the environmental incident immediately to the HSE Department
- Investigate and issue reports on environmental incidents (using the incident reporting system on BIM)
- Ensure corrective action is taken

Actions regarding specific incidents including water pollution and exceeding the limit levels for dust, noise, and vibration, are detailed in Section 8.

Report all environmental Incidents immediately to the HSE Department.

3.4. Subcontractors and suppliers

3.4.1. Subcontractors

All subcontractors will be required to work in accordance with BAM Contractors Environmental Management Plan. Work operations will be managed by the relevant Project Managers / Site Agents to ensure appropriate procedures are being followed. ISO 14001:2015 states consideration should be given to the aspects related to the organisation's activities, products, and services such as environmental performance, lifecycle perspectives and practices of contractors and suppliers. In order to achieve this, we ensure our subcontractors sign contracts which state they must comply with our Environmental Policy, our EMS and work within the Environmental Legal Framework while working for us on our projects.

During the recruitment stage, we would enquire as to whether they had been prosecuted with regard to breaching environmental legislation and this would also be considered. We would also enquire to the progress of their environmental management system (or equivalent) to ensure they were working in a responsible fashion and in a way which would be similar to BAM Contractors. Lines of communication would also be outlined during this recruitment stage to ensure they were aware of our environmental management system and how this will affect them and what they need to achieve in order to be suitable candidates for our Projects.

BAM have developed an online appraisal system which assesses the performance of current and previous subcontractors contracted by the company. The system requires project staff to assess and grade individual subcontractors on categories including Health, Safety and Environment, Quality, Programme and Commercial. Under our Commercial procedures, staff contracting and procuring from subcontractors and

suppliers must review the appraisal system prior to any contractual agreement. Under the appraisal management system if subcontractors or suppliers fail to meet the minimum rating, a warning is issued, and the subcontractor is removed from our approved subcontractors and suppliers list.

A list of subcontractors has been identified in the following table.

Table 3: Subcontractors

Contract	Company	Environmental contact	Commencement date	Duration
Formwork/ Concrete	To be appointed			
Groundworks	To be appointed			
Blockwork	To be appointed			

3.4.2. Suppliers

All suppliers and sub-contractors are made aware of the company's environmental and CSR policies and the project specific environmental requirements. BAM aim to collaborate with supply chain partners so as implement circular economic business models and achieve a positive environmental and economic impact. Innovative thinking between suppliers and subcontractors are therefore encouraged to promote recycling of materials and the use of sustainable materials.

An employee supervises all deliveries of environmental hazardous materials.

4. SUMMARY OF EMERGENCY PROCEDURES

Environmental emergency procedures relating to this Project include:

- Emergency Procedures for sediment release to water (EP-23)
- Containing and cleaning up spills (EP-15)
- Environmental Incident Procedure (EP-06)
- Environmental Complaints and Incidents Procedure (EP-24)
- BIM online incident tracking system.

For more detailed information please refer to <Environmental Emergency Plan>.

5. ENVIRONMENTAL PLANNING, ASPECTS AND CONTROLS

5.1. Environmental risk assessment

During the first visit to site, notes are produced which identifies any significant environmental aspects. These notes are compared with the environmental information supplied by the client (where applicable) and used as a basis for performing the environmental risk assessment.

5.2. Environmental risk assessment report

The significance of all the environmental aspects for each activity on the project have been assessed. The assessment followed the method defined in EP-02 Environmental Risk Assessment.

Refer to **Appendix 3** for the risk assessment report for this project.

5.3. Environmental assessment and management controls

The management controls, which have been put in place, are appropriate to the nature, duration, and scale of the activity on this project and the particular sensitively of the local environment. They will be revised in the event of any significant changes to the scope of the activity during this Project, especially when there is additional works, or a change in the method of works.

Additional management controls will be adopted when there are changes to client requirements, stakeholder interests to a particular local environmental sensitivity.

The significant risks which are highlighted in the risk assessment and the management controls are communicated to the workforce by site inductions and toolbox talks.

5.4. Method statements

The significant environmental aspects and the actions to apply the required controls are described in the method statement.

Method statements are produced in accordance with the contract requirements by the Site Management Team and reviewed by the Project Managers/Site Agents prior to submission for approval. When developing method statements, the EMP, Site Maps and any other relevant environmental management documents will be reviewed to assess the potential impacts of the particular activity.

All method statements will include a section entitled *Environmental and Waste Management*. For activities that have significant potential to cause adverse environmental impacts reference will be made in this section of the method statement to the control measures in Section 8 of the EMP. Additional control measures may be included where those in Section 8 prove inadequate to suit the local conditions at the

site of the activity, and/or where specific measures are required by any of the authorities. The method statement must include:

- The proposed method of construction and how impacts will be mitigated
- Waste (storage, removal, end disposal sites where known)
- Hazardous substances (storage, removal, and end disposal sites where known)
- Works close to waterways (sediment controls if needed)
- Dust
- Noise and vibrations
- Refuelling
- Fuel storage
- Drip trays/spill kits and other precautionary measures

Prior to the commencement of the works, all Method statements will be reviewed by a competent person by referring to Section 8 of the EMP. Following the review, improvements will be made to the method statements as required.

6. ENVIRONMENTAL COMPLIANCE

In accordance with Environmental Procedure 01 (EP-01) Environmental Compliance Assessment, a review of all relevant literature and contractual requirements relevant to the contract will be completed.

- Planning Conditions
- Contract Documents
- Preliminary Health and Safety Plan
- All other contractual conditions and documents.

These requirements have been tabulated in Appendix 2 (table of contractual requirements) to demonstrate how each of the requirements is addressed in the EMP.

Evaluation of compliance

Compliance will be evaluated through inspections and audits and also reviewed at the regular site management meetings.

6.1. Consultation with relevant authorities

Consultation has been undertaken with the following authorities: Local Council

- EPA
- National Parks and Wildlife Services (NPWS)
- Inland Fisheries Ireland
- Irish Water.

6.2. Site restrictions and hold points

In accordance with the Contract clauses or notification from the Client or similar the following environmental restrictions apply to the construction of the works:

Table 4: Site restrictions and hold points

Clause	**Restriction –** refer to Contract for complete details
	Engagement with IFI when working on or around existing watercourses
	Consultation with site ecologist in advance of all works particularly to address measures to be undertaken with Invasive Species.

6.3. Environmental licences, permits and permissions

6.3.1. Maintaining arrangements for environmental licence, permits and permissions

These are all legal documents associated with the work and may be from a contractor/supplier/client, or it may be an EPA or Local Authority Licences/Permit and will be maintained by the Management Team on site.

6.3.2. Licences and permits

The Client will be requested to supply information on the licences and permissions that are required for the project. The responsibility for licence applications will be established at the start of the project or when changes occur.

The relevant environmental regulator may be informed early in the project of the environmental aspects of the work. A meeting on site will be arranged where applicable.

N.B. a copy of all formal licences is to be sent to the HSE Department, Kill.

The following table identifies the licences that may be required:

Table 5: Licences and permits

Licence/Permission	Regulator	Operations
Discharge consent into watercourse or sewer	Local Authority/Irish Water	Any solid or liquid entering controlled waters (river, pond, stream, ditch) unless it is clean water
Consent for work near a watercourse	Inland Fisheries Ireland	Any work which include work over or under the water
Permissions / Licences	National Parks and Wildlife Services	Cutting of protected trees, derogation licences for protected species (bats, badgers, frogs etc), work in or near any SPA, SAC, NHA. Licences for managing invasive species
Permissions / Licences	Department of Environmental, Communities and Local Government	Excavation work in any site containing archaeological remains or natural habitat, protected Monument.
Planning Permissions	Bord Pleanala/LA	All planning permission constraints
Waste licences/permits	EPA/LA/NWCPO	Transport and removal of waste offsite

6.4. Company policy and procedures

A copy of the Company Environmental Policy is displayed at the project site offices. The policy determines the company's overall approach to environmental management, which is developed through the EMS. This EMP has been developed taking into account the:

- Company Environmental Policy
- Objectives and targets as specified in the Yearly Environmental Plan
- Requirements of relevant specific procedures as contained in the Environmental Procedures Manual.

6.5. Relevant statutory provisions

A library of environmental legislation, relevant codes of practice, standards and best practice guidance documents is maintained at the BAM Head office in Kill, Co. Kildare.

This library is updated by the Company Environmental Coordinator through regular reviews or as required by changes in legislation and standards and developments in industry best practice. A register of legal and compliance obligations is on SharePoint for general viewing.

6.6. Design and life cycle perspectives

The environmental and sustainability requirements for the project design are reviewed by project designers and construction management team and incorporated into the project as appropriate. The design and lifecycle perspectives are also reviewed by the Project Managers and Engineers to ensure that the environmental and sustainability considerations relevant to the construction works are incorporated into the works.

All environmental impacts and aspects of the project's lifecycle, from the raw materials used, procurement processes, the transportation and delivery to site, material use in the building product or service, to the end-of-life treatment and final disposal of the materials and products will be assessed, with the most favourable environmental option used where possible.

Input and consideration from relevant stakeholders will also be incorporated into both the design and construction processes. Communication with stakeholders may take place at various stages and means e.g., planning process, community newsletters, project website, Client meetings etc.

6.7. Control of documents

All documents relevant to the construction works will be kept and stored in accordance with the below table. Documents that are part of the site environmental management system, including inspection reports, monitoring records and meeting minutes will be kept for the duration of the project as per UKAS (United Kingdom accreditation scheme).

Table 6: Control of documents

No.	Document	Raised by	Retained by	Statute or UKAS	Currently held	Retention times (years)
1	Register of Environmental Aspects	Env Co-ordinator	Env Co-ordinator	UKAS	Head Office and Sites	3
2	Waste Transfer notes (where applicable)	External	Env Co-ordinator Site	Statute	Sites	3
3	Hazardous waste transfer notes	External	Env Co-ordinator Site	Statute	Sites	5
4	Waste Collection Permits	Local Authority	Env Co-ordinator	UKAS	Sites	Period of validity +1
5	Waste Facility Permits/Licences	Local Authority/EPA	Env Co-ordinator	UKAS	Sites	Period of validity +1
6	Energy Monitoring Records	Env Co-ordinator	Env Co-ordinator	UKAS	Head Office and Sites	3
7	Water Monitoring Records	Env Co-ordinator	Env Co-ordinator	UKAS	Sites	3
8	Local Authority / Environmental Protection Agency Licences	Local Authority / EPA	Env Co-ordinator Site	UKAS	Sites	Period of validity + 1
9	Environmental communication from external sources	External	Env Co-ordinator	UKAS	Sites	3
10	Audit Reports	Env Co-ordinator	Env Co-ordinator Head Office	UKAS	Head Office and Sites	3
11	Corrective Action Forms	Env Co-ordinator	Env Co-ordinator Head Office	UKAS	Head Office and Sites	3
12	Env N/C or Env Incident Report	Any member of staff	Env Co-ordinator Head Office	UKAS	Head Office	3
13	Water treatment log sheets	Site Staff	Site Staff	UKAS	Site	3
14	Calibration Certificates	External testers	Site Staff/ Env Co-ordinator	Statue	Site	3
15	Environmental Management Plans	Site Staff	Site Staff	UKAS	Sites	3

No.	Document	Raised by	Retained by	Statute or UKAS	Currently held	Retention times (years)
16	Waste Management Plans	Site Staff	Site Staff	UKAS	Sites	3
17	Environmental Risk Assessment	Env Co-ordinator	Env Co-ordinator and HSE Officer	Best Practice	Head Office Sites	3
18	Department of Arts Heritage and Gaeltacht	Env Co-ordinator	Env Co-ordinator Site	Best Practice	Sites	3

Controlled documents will be:

- Reviewed at least annually and updated as appropriate;
- Marked as superseded once obsolete or destroyed;
- Dated and marked with dates of revisions.

7. ENVIRONMENTAL OBJECTIVES AND TARGETS

The objectives and targets are set in relation to the aspects identified from each site in order to reduce our significant aspects. As a minimum they should include:-

- The prevention of pollution, including missions to air, water, and land
- Nuisance impacts including dust, noise, and vibration
- Protection of habitat areas and individual species, if applicable
- Storage and use of fuels and hazardous substances, including spills
- Waste management.

7.1. Environmental management targets

The environmental management targets for the project are as follows.

Table 7: Environmental management targets

Targets	Measurable	Methodology	Responsibility	Timescale
Achieve zero incidents of contamination to ground water from concrete works	Incidents, site inspections, quarterly audits, complaints	BAM procedures to be followed when working with concrete and washing out concrete chutes	Site Management Team	Start to completion
Ensure sediment on roads is cleared.	Raise needs for road cleaning duties during wet or busy periods	Ensure roads are swept and cleaned on a regular basis. Road conditions within the site should be kept clean at all times.	Site Management Team	Start to completion
Generate <9.0t C&D waste per 100m2 (gross internal floor area)	Lean Construction Techniques, segregation more, reuse more (waste hierarchy)	Purchase less, ensure packaging is removed by supplier where possible and other materials reused & recycled	Site Management Team	Start to completion
Lower fuel and oil spillages from site activities. Bunds to be used with all fuels and oils	Environmental Incidents, spills contained in bunds	Ensure that drip trays are used at all times under static plant, when refilling, & storing, ensure fuel storage areas are bunded.	Site Management Team	Start to completion
Ensure correct disposal of all hazardous wastes	Waste segregation, waste costs	All hazardous wastes to be disposed as per Irish Legislation and BAM requirements	Site Management Team	Start to completion

Targets	Measurable	Methodology	Responsibility	Timescale
Ensure no incidents of pollution to water.	Water monitoring and sampling activities. Environmental Incident.	Sediment controls to be used, no waters to be discharged to any controlled waters or drainage systems without approval. Work with CIRIA guidelines and apply BAM precautionary measures	Site Management Team	Start to completion
Lower consumption of materials and fuel on monthly basis (relative to project revenue)	Smart meters, energy bills, service costs	Ensure all energy using equipment is switched off when not in use. Select best value for money providers where possible	Site Management Team	Start to completion
Reduce site electricity on monthly basis (relative to project revenue)	Smart meters, energy bills, service costs	Ensure all energy using equipment is switched off when not in use. Select best value for money providers where possible	Site Management Team	Start to completion
Lower emissions of dust, smoke and fumes during works	Air quality, dust particle increase	Ensure all equipment is well serviced and maintained. Switch off equipment when not in use. Use dust suppression techniques when applicable	Site Management Team	Start to completion
Reduce amount of Public complaints	Complaints received to Site Management Team	Ensure when works which will impede public access are taking place, all residents are informed for the timescale (where applicable) and all restrictions are kept to a minimum	Site Management Team	Start to completion
Minimise water usage consumption	Water charges, waste water disposal (discharge volumes)	All grey water to be reused on site where possible. ‘Fresh’ water supply to be kept to a minimum where possible. TBT-12 Water on Construction Sites	Site Management Team	Start to completion

Targets	Measurable	Methodology	Responsibility	Timescale
Minimise risk of Aspergillus	Air quality, dust particle increase	National Guidelines for the Prevention of Nonocomial Invasive Aspergillus during Construction / Renovation activities on Aspergillus Control will be adhered to	Site Management Team	Start to completion
Minimise airborne & ground bourne noise	Noise triggers breached (where applicable)	All construction noise limits set out in the requirements will be adhered to.	Site Management Team	Start to completion
Minimise vibration	Vibration triggers breached (where applicable)	All vibration limits set out in the works requirements will be adhered to.	Site Management Team	Start to completion
Ensure no vehicle movement and material placement does not cause damage to flora and fauna	Correct habitat protection used. Wildlife surveys where applicable	All fauna/animal species to be untouched where possible. Professional advice to be sought on removal procedures	Site Management Team	Start to completion

The standard environmental management goals for the project are to:

- Conduct all activities in accordance with the:
  - Company environmental policy and procedures;
  - Relevant statutory regulations and provisions;
  - Contractual requirements with the client; and
  - Requirements of relevant authorities;
- Minimise adverse environmental impacts during construction;
- Enhance natural environments during the course of construction, where practical
- Reduce the significance of our aspects and impacts through our working methods
- Increase subcontractor awareness of our EMS
- Increase company awareness of sustainability issues

BAM Contractors has established company environmental and sustainability targets which are documented in the 2021 Environmental Year Plan. These targets include;

- 3% reduction of total construction waste (relative to total revenue) compared to 2020.
- 5% reduction of the relative CO2 emissions (total CO2 per total revenue) compared to 2020.
- Achieve >98% recovery rate for all C&O waste.
- < 4 reported environmental incidents annually.
- Achieve zero spillages to water courses.
- < 10 reported environmental complaints annually.
- All sites to achieve 93% pass rate in environmental audits.
- ≤ 9.0t C&D waste generated per 100m² (gross internal floor area) *Target only applicable to building sites

In order to help achive these targets, the below table highlights compliance tools.

7.2. Initiatives to achieve targets

Table 8: Initiatives to achieve targets

Sites	Area	Objectives and targets	Method for achieving	Assistance by HSE Dept. (method)	Responsibility
All sites and offices	**Waste**	Eliminate waste sent to landfill	Adhere to the waste hierarchy. Lean construction techniques	EA-30 Excavated materials on site (*Article 27 Notification Forms*). CIRIA documents on Lean Construction	Site Teams and HSE Dept.
		Increase site segregation of construction waste by 10%	Additional recycling skips on site Increase staff knowledge and participation	EP-16 waste definitions and classifications, TBT-03 Managing Waste, TBT-02 Environmental Awareness, EB-11 Site Set up	Site Teams and HSE dept.
		Increase recycling rates	Increase site awareness of improved waste management practices	Waste posters, environmental information to be issued focusing on new waste strategies	Site Teams and HSE Dept.
All sites and offices	**Energy**	SMART Meters for all sites	SMART meters installed in cabins	Advice on installation and data collected	Site Teams and HSE Dept
		Reduce CO_2 emissions	Implement an energy reduction initiative in sites and offices	Environmental information to be issued focusing on new waste strategies	Site Teams and HSE Dept
		Temperature control in cabins	Thermostats installed	Advice on installation and data collected	Site Teams and HSE Dept

Sites	Area	Objectives and targets	Method for achieving	Assistance by HSE Dept. (method)	Responsibility
		Energy initiatives	SEAI Initiatives	Online calculation tools (energy) Energy posters Relatively paperless sites	HSE Dept IT Dept.
		Reduction in fuel usage / air emissions	Car Purchasing	Procurement of low emissions vehicles by Plant Department. Video conferencing capabilities in Offices to cut down on travel times, emissions.	Site Teams and HSE Dept
All sites and offices	**Auditing And performance**	All sites to achieve 'Pass' mark from quarterly audits >93%	Quarterly audits	Regular environmental information and directions to be issued to the sites	Sites Teams and HSE Dept.
		Appraisal system for environmental performance	Subcontractor appraisal system (COINS)	Detailed information of the systems and scores circulated to all.	Sites Teams and HSE Dept.

8. ENVIRONMENTAL CONTROL MEASURES

Control measures will be implemented both on an activity specific basis for the area of works, and independently of any specific activities as part of the general site management. Throughout this section reference may be made to standard procedures contained in the Environmental Procedures Manual that will be adopted on site. The Environmental Procedures are available on SharePoint.

The project will be developed in accordance with the control measures and with reference to the following guidance documents:

- BRE (2003) Control of dust from construction and demolition activities
- BS 5228-1: 2009+A1:2014 CoP for Noise and vibration control on construction and open sites: Part 1: Noise
- BS 5228-2: 2009+A1:2014 CoP for Noise and vibration control on construction and open sites: Part 2: Vibration
- BS 5837: 2012 Trees in relation to design, demolition and construction works
- BS8895-1:2013 Designing material efficiency in building projects Part 1: CoP for strategic definition
- CIRIA 741 (2015) Environmental Good Practice On Site (Fourth Edition)
- CIRIA 532 (2001) Control of Water Pollution from Construction Sites – Guidance for consultants and contractors
- IFI (2016) Guidelines on Protection of Fisheries during Construction Works in adjacent to Waters
- Fisheries Guidelines for Local Authority Works (Department of Marine and Natural Resources, 1998)

Other guidance documents may be referenced for specific issues throughout this section. Copies of these documents are held by the Company Environmental Coordinator and on SharePoint.

The control measures and monitoring requirements listed in this section must be implemented throughout the project.

8.1. Water Pollution Control

All watercourses that are potentially impacted by the works are identified on the site maps included in Appendix 4.

8.1.1. Water Pollution Control & Mitigation Measures

BAM as representative will secure the services of a suitably qualified Ecologist to act as an Ecological Clerk of Works (ECoW) to record the efficacy of water quality protection measures and measures to avoid noise disturbance to wintering birds set out in the following sections.

The following mitigation measures are included and will be completed as part of the Project.

Management of Water Quality

A Management Plan has been developed for the project to ensure that the construction works will not deteriorate the water quality and will safeguard existing water. The key to avoid impacts to water during the construction works is good site management practices, tight controls, regular inspections and ongoing vigilance with staff and employees on site.

Construction best practice measures (of relevance in respect of any potential ecological impacts) will be implemented throughout the project, including the preparation and implementation of detailed method statements. The works will incorporate the relevant elements of the guidelines outlined below:

- IFI (2016) *Guidelines on protection of fisheries during construction Works in and adjacent to waters* (IFI, 2016).
- Masters-Williams *et al.* (2001) *Control of water pollution from construction sites. Guidance for consultants and contractors (C532).* CIRIA.
- E. Murnane, A. Heap and A. Swain. (2006) *Control of water pollution from linear construction projects. Technical guidance (C648). CIRIA.*
- E. Murnane et al., (2006) *Control of water pollution from linear construction projects. Site guide (C649). CIRIA.*

In addition, the following construction surface water management measures will be implemented and monitored for the duration of the works. The potential for the construction works to have an impact on the quality of the local watercourses will be minimised through the implementation of the following control measures as outlined:

Contact will be maintained with the relevant authority such as the Inland Fisheries Ireland when required.

- Special attention will be paid to minimising the opportunities for wash-off of inert solids (usually from exposed soil mounds, embankments or excavated trenches etc.) from entering watercourses. Silt traps will be used where necessary around the open steams and watercourses.
- A sedimat will be utilised for the protection of streams from sedimentation damage during in stream construction activities for the installation of culverts,
- Care will be taken to avoid interference with the supply or quality of any groundwater resource.

- Waste products associated with the works will not be permitted to enter watercourses adjacent to the works through the use of French drains, petrol interceptors or other agreed methods.
- Water that is high in solids or contaminated with cement or oil, will not be pumped from excavations directly to watercourses without pre-treatment (e.g. sedimentation/ filtration and oil separation).
- All site run-off associated with the construction will be directed to storm control areas or tanks to prevent direct discharge into water courses.
- All operational machinery used in-stream will be kept to an absolute minimum.
- Spill kits will be provided at all river locations identified.
- Fuels, oils, greases and hydraulic fluids will be stored in bunded compounds well away from watercourses. Refueling of machinery, etc. must be carried out in bunded areas. Fuels will be stored during the construction phase in bunded fuel storage tanks with a 110% holding capacity. Where it is necessary to dispense fuels on site, this will be undertaken in areas covered with an impermeable surface to protect surface water and ground water;
- Construction works, especially ones involving the pouring of concrete, will be conducted in the dry. Precast concrete will be used in preference to uncured concrete, which kills aquatic fauna through alteration of stream pH. When cast-in-place concrete is required, all work will be done in the dry and allowed cure for 48 hours before re-flooding.
- To help prevent the contamination of the ground and groundwater, contaminated materials (oils, fuels, chemicals etc.) will be used and stored in an appropriate manner as outlined in the relevant guidance, i.e. CIRIA (2001) and DMRB Volume 11 (1994).

Should any monitoring or inspection indicate that pollution of the Castlelake Roads Infrastructure or adjacent watercourses has occurred then the Site Management Team will immediately inspect all work activities to ascertain whether they are operating effectively. All works may be stopped and/or additional control measures installed to prevent further pollution or discharge to the watercourse. Appropriate action will be taken in consultation with the Site Agent. Water samples will be taken at the watercourse if required.

Silt Fencing

As an additional measure where the construction works will be closest to Lough Mahon, silt fencing will be installed on the sea-ward side of the open construction drainage channel along the eastern perimeter of the fire water retention pond. purpose of the silt fence is to retain any soil and silt disturbed during construction. The silt fence will act as an additional mitigation

measure, in addition to the drainage channel, to prevent the egress of sediment into Lough Mahon.

Inspection and Maintenance

The construction drainage system for the proposed development must be managed and monitored at all times and particularly after heavy rainfall events during the construction phase. The construction drainage system will be regularly inspected and maintained to ensure that any failures are quickly identified and repaired so as to limit/prevent water pollution.

Management of Concrete

To reduce the potential for cementitious material entering surface waters, concrete pours will be supervised by the Construction Manager, a suitably qualified Engineer and the Environmental Manager. 22461 Castlelake Strategic Housing Development EIAR 61 May 2022

Management Measures will include the following:

- The Construction Manager will ensure that the area of the pour is completely drained of water before a pour commences.
- Pours will not take place during forecasted heavy rainfall;
- Incidental rainfall from light showers during the period of a pour is typically absorbed into the concrete matrix but heavier showers can result in some run off from the top surface of the concrete pour. If run-off is encountered the Environmental Manager will block the outflow from the drains to retain or treat the run-off until the pH is neutral before discharge to the drainage network;
- In the event of a spillage on site, the Environmental Manager will temporarily block the dirty water drains in the immediate area and monitor the pH levels of the water in the open drainage channel and if necessary, will adjust the pH levels using CO2 entrainment. Any spillage will be cleared immediately and deposited in the Chute wash down area;
- To reduce the volume of cementitious water, washout of concrete trucks will not take place on site. Concrete trucks will be washed out off site at the source quarry. Only Concrete truck chutes will be allowed to be cleaned on site at a central concrete wash out area.

Fuel and Oils Management

Fuel Management Measures that will be employed during the Construction phase include:

- The potential for hydrocarbons getting into the existing drains and Lough Mahon will be mitigated by only refuelling construction machinery and vehicles in designated refuelling areas using a prescribed re-fuelling procedure;
- Refuelling will be carried out using 110% capacity double bunded mobile bowsers. The refuelling bowser will be operated by trained personnel. The bowser will have spill containment equipment which the operators will be fully trained in using;
- To reduce the potential for oil leaks, only mechanically sound vehicles and machinery will be allowed onto the site. An up to date service record will be required from the main contractor;
- Mobile bowsers, tanks and drums should be stored in secure, impermeable storage area, away from drains and open water.
- Collision with oil stores will be prevented by locating oils within a steel container in a designated area of the site compound away from vehicle movements.
- Potential leaks from delivery vehicles will be reduced by visually inspecting all delivery vehicles for major leaks. Contractors supplying concrete and crushed stone to the site will be contractually required to supply their products using roadworthy vehicles;
- Should there be an oil leak or spill, the leak or spill will be contained immediately using oil spill kits. This contaminated material will be properly disposed of in a licensed waste facility;
- The Environmental Manager will be immediately informed of the oil leak/spill, and will assess the cause and the management of the clean-up of the leak or spill. They will inspect nearby drains for the presence of oil, and initiate the clean-up if necessary;
- Immediate action will be facilitated by easy access to oil spill kits. An oil spill kit that includes absorbing pads and socks will be kept at the site compound and also in site vehicles and machinery;
- Corrective action in the event of a leak or spill will be facilitated by training all vehicle/machinery operators in the use of the spill kits and the correct containment and cleaning up of oil spills or leaks. This training will be provided by the Environmental Manager at site induction;
- In the event of a major oil spill, a company who provide a rapid response emergency service for major fuel spills will be immediately called for assistance, their contact details will be kept in the site office and in the spill kits kept in site vehicles and machinery.

- Long term storage of waste oils will not be allowed on site. These waste oils will be collected in leak-proof containers and removed from the site for disposal or re-cycling by an approved service provider.

Stream Enhancement Works

Some reaches of the Woodstock Stream within the study area have been modified in the past and/or degraded due to adjacent land practices and/or re-sectioning (straightened and realigned). The physical character of the Woodstock Stream will be diversified by using guidance in '*Channels and Challenges - the Enhancement of Salmonid Rivers* (O'Grady, 2006) as well as O'Grady *et al*, (2017). This will increase the quality and quantity of salmonid spawning, nursery and holding habitat. This will offset past degradation and compensate for any impacts that may occur during construction stage on these reaches of the Woodstock Stream.

The following is proposed regarding enhancement of the Woodstock Stream:

- Instream enhancement and riparian enhancement;
- Removal of most of concrete rubble. Some can be used in conjunction with imported gravel to create instream features;
- Creation of riffle, glide1 and pool sequences along both reaches by installation of rock pools. This Installing a series of stone weirs (notched and vortex) at gradient breaks and higher gradient stretches along the channel. Weir construction would be at least seven channel widths in distance apart;
- Introduction of instream random boulders;
- The works will commence at the top of the reach and progress downstream;
- The works would be undertaken outside the salmonid spawning season, so would have to be carried out between June (or July) – September inclusive; and
- Riparian enhancement will involve the sporadic planting of native trees and shrubs.

These works would be overseen by the ECoW who will be familiar with rivers work and have a good knowledge of salmonid habitat requirements. To this end, the ECoW will have a general knowledge of content outlined in publications such as '*Ecology of the Atlantic Salmon*' (Hendry and Cragg-Hine, 2003) and '*Trout and Salmon - Ecology, Conservation and Rehabilitation*' (Crisp, 2000). Duties will include the delivery of toolbox talks and monitoring of construction phase to ensure all environmental controls with reference to IFI (2016) are implemented in full. The ECoW would consult/liaise with the IFI during the works.

Under the Fisheries (Consolidation) Act, 1959, and as revised (2010), it is an offence to disturb the bed of a river; therefore it will be necessary to get written permission from Inland Fisheries

Ireland to proceed with the works in any areas where disturbance to the spawning and nursery areas of salmonids will occur as a result of the proposed development.

8.1.2. Water Pollution Incidents

Should any monitoring or inspection indicate that pollution of the *Castlelake SHD Project* or adjacent watercourses has occurred then the Site Management Team will immediately inspect the all work activities to ascertain whether they are operating effectively. All works will be stopped and/or additional control measures installed to prevent further pollution or discharge to the watercourse. Appropriate action will be taken in consultation with the Project Manager. Water samples will be taken at the watercourse if required. The incident will be logged on the incident reporting system on BIM.

8.2. Invasive Species Action

During an ecological survey site visit in August 2021 in relation to the preparation of a report to inform the appropriate assessment screening ("AA screening report"), the following invasive species were identified within the redline boundary of the proposed development site:

- Himalayan balsam (Impatiens glandulifera);
- Japanese rose (Rosa rugosa)

Figure 2: Showing areas of Himalayan balsam (Impatiens glandulifera – green hatching) within and adjacent to site and Japanese Rose location (Rosa rugosa) within the site redline boundary (pink circle)

8.2.1. Himalayan Balsam (Impatiens glandulifera) Eradication

Best Practice Management Measures

Himalayan balsam (Impatiens glandulifera) is listed on the Third Schedule of the Birds and Habitats Regulations and is considered a high-risk invasive species, which has the ability to create competition for resources such as pollinators, light and space, posing a threat to native plant species.

In line with guidance published by the National Roads Authority, now Transport Infrastructure Ireland (The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads, 2010) the following control options were identified:

Option 1 – Physical control: Physical removal should be attempted where the ground is level and good access is possible. In the circumstances, plants can be strimmed, cut, or mown back to ground level before flowering in June. The plant should be cut as low as possible, or at least below the lowest node, otherwise re-spouting will occur. Any mechanical removal of Himalayan balsam before June will promote greater seed production in re-growth. The area should be mown regularly to prevent sprouting and flower formation and repeated annually until area is under complete control.

Hand pulling is also another effective method of removal given the shallow rooting of Himalayan balsam. Hand pulling should be repeated in August to deal with sprouting of seeds. Plant material can be disposed of via compost, though due to potential presence of seeds, disposal of landfill or disposal by burning may be favourable.

Option 2 – Chemical control: Effective control of Himalayan balsam using chemical application of glyphosate or 2, 4-D amine applied during the active growth phase in late spring targeting germinating seedlings. However, it should be noted that glyphosate is a broad-spectrum herbicide so care should be taken when applying amongst sensitive species or adjacent to waterbodies where there should be a buffer zone of no chemical application, according to the product instructions.

Grasses are unaffected by glyphosate; therefore, chemical control may be preferable in circumstances wherein grass types are present. Guidelines recommend repeat treatments for five or more year. Ongoing monitoring of the site will also be required in spring and summer to assess seedling presence and possible further control measures.

Proposed Measures for Eradication of Himalayan Balsam at Carrigtwohill

It is recommended that a combination of the options outlined above is undertaken to eradicate and avoid the spread of the plant both within and outside of the site. The proposed measures are outlined in the following section.

Due to the extensive nature of the established Himalayan balsam on site, existing plants will be mowed to ground level before flowering occurs in June and where ground is level. Hand-pulling methods may also be employed during the pre-flowering season and is most effect following rainfall. Pulled and mown sites will be revisited in August for follow-up pulling. Stockpiled material should be removed, covered and fenced off, to prevent any

further spread of seeds on site. Works will be undertaken always using a single designated piece of machinery, e.g., one strimmer, mower, cutter etc. Vegetation material removed via physical controls should be disposed of via landfill or burning to remove risk of by propagation by seeds. Coincidentally, chemical control measures may be employed in late April to May, during the active growth phase in late spring, using glyphosate. The chemical treatment may be applied using foliar spray, wiper application or spot treatment. Areas treated with glyphosate will require retreatment in later summer months to target seedling germination and again annually for ongoing control. Given the extensive nature of Himalayan balsam at the site, it is recommended that follow up monitoring is undertaken on the site and spraying of regrowth carried out as necessary. Further to the above, toolbox talks will be carried out to communicate measures to all personnel involved.

Biosecurity Measures

In addition to the above, the following biosecurity measures will be implemented:

- Any vehicles/plant operating within the infested areas will be cleaned thoroughly when entering and / or leaving the exclusion zones.

o Designated wash-down areas will be set up within the exclusion zone, and away from drains and watercourses; plant/equipment will be washed down on geotextile membrane, so that any potential contaminated material will be contained.

o Vehicles will be cleaned of all earth and loose sediments, with particular attention paid to tyre treads, wheel arches and hinged joints.

o The minimum amount of machinery possible will be used to minimise the potential spread of the species.

o All tools, materials and work wear will be inspected, and cleaned as necessary, with particular attention paid to footwear and hand tools.

- Work boots will be dipped in or scrubbed with a disinfectant solution and thoroughly dried afterwards before being used on the site for the first time;

- PPE and tools will remain on site for the duration of construction;

- All PPE will be visually inspected and any attached vegetation or debris removed.

8.2.2. Japanese Rose Eradication

Best Practice Management Measures

Though not a species listed under Third Schedule, control of Japanese rose to prevent its spread within the area should be implemented to avoid inadvertent propagation of this species. Physical removal of the entire plant, at both small- and large-scale infestations, is recommended. Chemical control using herbicide is also an effective control.

Proposed Measures for Eradication of Japanese Rose at Carrigtwohill

Physical removal of the plant by hand-pulling is effective for small populations but roots and rhizomes must also be removed to prevent recolonisation. Hand-pulling can be combined with application of glyphosate. Applications of the herbicide can be made with

brush to avoid affecting other plants. As per chemical control of Himalayan balsam, use of herbicide must be fully in keeping with manufacturer instructions and with consideration to appropriate buffer zones when adjacent to water bodies. Follow up monitoring and treatment will be necessary to ensure full long-term eradication (Weidema, 2006).

Biosecurity Measures

Japanese rose is suspected to disperse via rhizomes, water, and seeds within fruit. Therefore, a similar protocol as that described for 8.2.1 should be employed when removing Japanese rose.

8.3. Noise & Vibration Control

The primary sources of noise and vibration associated with the project have been identified as follows:

- Machinery
- Concrete Pours
- Hand tools
- Generators.

Noise criteria used for assessing the significance of construction impacts are as follows: *example given below – amend as per contract requirements or use BS 5228-1:2009+A1:2014)*

Period	Hours	Ambient Noise Level, Leq measured on site (dB(A) Note 1	Period of hours over which Leq, is applicable	Maximum allowable sound level on site (dB(A) Note 2
Days	0700 – 1900	65	1 hour	80
Evening	1700 – 2200	55	1 hour	65
Weekends	0800-1300	55	1 hour	65

Note 1: Determined from Methodology in BS 5228 Noise & Vibration from Open and Construction Sites.

Note 2: Sourced from National Roads Authority Guidelines for the Treatment of Noise and Vibration in National Road Schemes.

These levels apply at 1m from the façade of neighbouring noise sensitive buildings.

Operating limits for vibration are as follows:

Freqency	Vibration Limit	Intervention Value
<10 Hz	8mm/s	6mm/s
10 to 50 Hz	12.5mm/s	10mm/s
50 to 100 Hz	20mm/s	16mm/s

All works are scheduled to be completed within the *Working hours are in accordance with the Planning Conditions and Environmental Legislation in that we will operate between Monday to Friday 07:00 – 19:00hrs and on Saturdays 08:00 – 13:00hrs. No works will occur on Sundays or Bank Holidays &* as specified in the contract.

Best practicable means should be employed to minimise noise levels, in accordance with the British Standard BS 522: 2009+A1:2014. Noise and vibration control on construction and open sites (Parts 1 and 2) for basic information and procedures for noise and vibration control. A copy of this standard is available at the site or from SharePoint.

8.3.1. 8.2.1 Noise & Vibration Control Measures

Noise reduction measures will be undertaken in accordance with the Procedure EP-09 Noise and Vibration Control, which has been developed taking into account the requirements of BS 5528, particularly Section 10, and include:

Plant and machinery in good order
Working within the allowed site hours
Turning off machinery/ plant when not in use.
RAMS to include specific noise controls

8.3.2. Noise and vibration monitoring

Noise will be monitored regularly and recorded for high noise generating activities via a handheld monitor as required.

All boundary walls/ structures will be surveyed and recorded prior to any works commencing and will be visually monitored during construction works.

8.3.3. Noise and vibration incidents

Should any monitoring indicate that noise or vibration levels have exceeded the intervention values then the plant or equipment causing the noise / vibration will be powered down immediately. Appropriate action will be taken in consultation with the Project Manager to reduce the noise and/or vibration levels. Actions may include:

- Servicing and or modifying the plant / equipment
- Replacing the plant / equipment
- Moving the operation away from sensitive receptors
- Rescheduling the activity
- Erecting noise barriers where other measures are not practical

When noise and vibration monitoring is taking place, all monitors should take into account the background noise and situation when monitoring. External noise and vibration reports to reference to this fact also.

The incident will be logged in the Incident Register if levels have been breached and background noise was deemed not a factor at the time of the occurrence.

8.4. Air pollution control

The main types of air pollution that will result from the works are dust and exhaust emissions from combustion engines, and plant machinery and vehicles. Activities with the potential to produce to dust are:

- Plant and vehicle movement
- Bulk materials handling
- Stockpiles
- Vehicle movement off site
- Include any additional sources

8.4.1. Dust minimisation plan

Dust will be minimised on site through the implementation of the following control measures developed in accordance with the Procedure EP-08 Air Pollution Control:

The site will use a water bowers to dampen site roads during dry conditions.

Water suppression will be used at source to reduce the amount of nuisance dust becoming airborne.

8.4.2. Other air quality control measures

- Exhaust emissions where practical will be minimised by ensuring that all plant, equipment and vehicles are in good working order and regularly serviced to ensure efficient running, by using the smallest engine-sized plant and equipment suitable for the task and by ensuring that engines are not left idling unnecessarily.
- Burning of materials on site will not be permitted.

8.4.3. Dust monitoring

Dust Monitoring will be carried out visually by the site team during the course of the working day.

8.5. Habitat (Flora & Fauna) Protection

Generally ecological mitigation measures are incorporated into the project design and the requirement during the construction stage is to ensure that all mitigations are fully implemented. Additional measures may be implemented during construction to limit additional habitat and fauna disturbance outside the area of works as listed below.

All work activities will comply with the Environmental Protection Agency Act 1992 and Wildlife Act 1976 and amendments 2000 to 2010 and the European Communities (Birds and Natural Habitats) Regulations 2011.

8.5.1. Construction mitigation measures

Control measures will be implemented in accordance with EP-12 Habitat, Flora and Fauna Protection *and the following site specific measures*:

An Ecologist to be egaged for works prior to commencing on site.

No nightitme construction works will take place.

Scrub clearance and tree felling will take lace outside of the bird nesting season which is from 1st March -30th August inclusive.

Noisereduction measures will include:

Locate plant known to emit noise in one direction away from sensitive receivers.

Ensure plant & equipment is well maintained and lubricated.

Prevent machine idling.

Start up plant sequentially

Plan noisy activities to minimise effects on sensitive receivers.

Plant selection to minimise effects on sensitive receivers.

8.5.2. Fish and Fisheries Habitat Mitigation Measures

Refer to the mitigation measures in section 8.1 for water pollution.

Additional measure to mitigate potential pollution to fish and fisheries habitat are as follows:

Refuelling of all plant and machinery will be carried out with bunds in place.

Drip trays will be in place for all re-fueling and storage of liquids/ fuels.

Pumping of any water will be done via permit system.

All works undertaken to existing watercourses to include any ecological requirements and advice of IFI.

8.5.3. Bats

Mitigation for bats will follow:

Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes (NRA, 2005a);

• Guidelines for the treatment of bats during the construction of National Road Schemes (NRA, 2005b); and

• NPWS Irish Wildlife Manuals, No. 28: Bat Mitigation Guidelines for Ireland – V2 (Marnell et al., 2022).

If felling trees with bat roosting potential, trees will be inspected fo the presence of bats and/or other bat activity by a suitably qualified bat ecologist during daylight hours and night time using a bat detector.

Where examination of the tree has shown that bats have not emerged or returned to tree, felling may proceed the following day. Should a delay in felling be encountered, resurveying is required.

In areas where bat activity has been recorded, tree-felling must not be conducted in June to early August. Note there are no trees that would be considered as obviously of value as roost habitat. As such, any vegetation and tree removal should be carried out during winter (December to February) to avoid impacts on bats, corresponding to a time when even best bat roost habitat recorded on site would be highly unlikely to be used as winter roosts. Winter hibernation roosts are generally restricted to places that are sheltered from extremes of temperature (Marnell et al., 2022) and trees present on site are deemed unlikely to be mature enough to provide appropriate winter roosting habitat on the basis of the habitat suitability survey carried out on-site.

It is recommended that any trees on site with ivy should be dropped to the ground as gently as possible and left on the ground for a period of 24hrs post felling under the supervision of the ECoW. This soft felling approach will give any bats, if present, the opportunity to vacate.

8.6. Waste management (including hazardous waste)

A Waste Management Plan will be established and the waste management measures for the Project are detailed in a separate document, which includes:

- Waste management targets
- The potential waste materials produced during the project
- Waste handling procedures
- Waste Permits required
- Waste reuse, recycling and disposal techniques
- A map showing designated waste handling areas.

The Waste Management Plan also covers the handling and disposal of hazardous wastes such as asbestos, fuels and used absorbent materials.

With regard to potential nuisance from temporary site offices and canteen, the following measures will be observed:

- Site offices will be maintained in a tidy condition.
- Litter will be cleaned up daily, particularly around skip bins, in accordance with EP-19 Litter Management.

8.7. Hazardous materials handling & storage

During the works there will be a requirement for the use of hazardous substances, including but not limited to:

- Fuel oil
- Diesel
- Hydraulic oil
- Shuttering oil
- Liquid cement
- Concrete curing agent.

The management of such substances will be carried out in accordance with the procedures for:

- Bulk Fuel and Oil Storage (EP-13)
- Storage and Handling of Hazardous Substances (EP-14)
- Containing and Cleaning Up Spills (EP-15).

All chemicals not covered by EP13, EP14 and EP15 will be managed in accordance with the requirements of the relevant safety data sheet (SDS) and the Health and Safety Plan.

- Hazardous materials are kept in lockable stores located in the main compound. Spill kits are also kept at these locations. Any hazardous materials must be returned to the stores at the end of each day and not left on site
- Oil and fuel will be stored in bunded areas and will be stored well away from any water discharge point or, where not possible, the discharge point will be adequately protected to prevent spills from entering
- Diesel pumps, generators or similar will be placed on impervious drip trays to capture minor spills and leaks and located at least 10m from any water discharge point
- Tools and equipment will not be washed in or near any watercourses and if undertaken on site wash water will be directed to appropriate retention controls and not allowed to directly enter any watercourse.

Fuels, lubricants and hydraulic fluids for equipment used on the construction site will be carefully handled to avoid spillage, properly secured against unauthorised access and provided with spill containment. Fuelling and lubrication of equipment will not be carried out in the vicinity of water discharge points. Waste oils and hydraulic fluids will be collected in leak-proof containers and transported off-site for disposal or recycling at appropriately licensed facilities.

8.8. Vermin control

Control measures associated with vermin are as follows:

Rentokil have been engaged to carry out Monthly site visits or as required.

All waste will be controlled by the site team.

8.9. Landscape

Landscape measures will be implemented in accordance with the Landscape Design required by the contract, to be prepared by the Designer.

8.10. Archaeology

N/A

9. MANAGEMENT REVIEW

The implementation of the EMP is reviewed monthly on site at the internal site meetings. These meetings are attended by site management and by personnel responsible for the implementation of the EMP. During the meeting all aspects of the environmental management are considered, including:

- Upcoming work
- Environments risks foreseen
- Control measures for the protection of the environment
- Internal and external audit results
- Inspection and monitoring results;
- Environmental alerts and bulletins
- Any issues raised by site staff or in relation to environmental management
- Site goals and targets
- Control measures for protection of the environment
- Any other significant issues.

Changes are made to the on-site management as required to achieve a continual improvement in environmental performance.

Environmental issues will be brought to the attention of the workforce through toolbox talks and through the Monthly HSE Meeting.

The EMP itself shall be reviewed at least every six months by the Site Management Team to ensure that it continues to be adequate and effective and changes made as required. Any changes shall be made by the Site HSE Officer and a new revision of the EMP issued to all personnel on the circulation list on page 1 of this document.

10. TRAINING AND COMPETENCE

The environmental management requirements shall be communicated to all staff and contractors at the HSE induction. All employees and contractors are required to undertake an online induction and a site specific induction prior to conducting any work on site (for further details refer to the Health and Safety Plan) and employees shall be made aware of their responsibilities in accordance with this management plan. A record of inductions shall be kept by the Safety, Health & Environmental Officer.

Toolbox talks will be conducted with relevant employees on various aspects of the environmental management plan, activity control measures and environmental procedures. Three toolbox talks on environmental, sustainability or waste issues must be conducted per quarter.

Toolbox talks shall be conducted by the Site Management Team. The schedule for toolbox talks shall be at the discretion of the Site Management Team and additional toolbox talks will be given in response to complaints, or where the particular environmental risks have been identified.

Table 9:Recommended toolbox talks

Toolbox talk topic	Reference material	When*	Recipients
Environmental Management	Environmental Policy, EMP, Environmental Procedures Manual	Commencement of site activities	All site crews
TBT 01	Hazardous Substances	Regular Intervals	All site crews
TBT 02	Environmental Awareness	Regular Intervals	All site crews
TBT 03	Managing Waste	Regular Intervals	All site crews
TBT 04	Spill Control	Regular Intervals	All site crews
TBT 05	Waste Pollution Prevention (Fuel & Oil)	Regular Intervals	All site crews
TBT 06	Silt Management	Regular Intervals	All site crews
TBT 07	Fire	Regular Intervals	All site crews
TBT 08	Storage of Hazardous Waste on Site	Regular Intervals	All site crews
TBT 09	Japanese Knotweed	Regular Intervals	All site crews
TBT 10	Chemical & Fuel on site	Regular Intervals	All site crews
TBT 11	Trees	Regular Intervals	All site crews
TBT 12	Water on Construction Sites	Regular Intervals	All site crews
TBT 13	Dust and Air Quality	Regular Intervals	All site crews
TBT 14	Noise and Vibration	Regular Intervals	All site crews
TBT 15	Archaeology	Regular Intervals	All site crews
TBT 16	Working in previous developed areas	Regular Intervals	All site crews
TBT 17	Pumping and over pumping	Regular Intervals	All site crews

Toolbox talk topic	Reference material	When*	Recipients
TBT 18	Water pollution - cement and concrete	Regular Intervals	All site crews
TBT 19	Material handling and housekeeping	Regular Intervals	All site crews
TBT 20	Washing down plant and equipment	Regular Intervals	All site crews
TBT 21	Energy conservation - electricity and fuel	Regular Intervals	All site crews
TBT 22	Bentonite	Regular Intervals	All site crews
TBT 23	Be a good neighbour	Regular Intervals	All site crews
TBT 24	Sustainability	Regular Intervals	All site crews
TBT 25	Eco driving	Regular Intervals	All site crews
TBT 26	Fuel efficiency	Regular Intervals	All site crews
TBT 27	Material handling and storage	Regular Intervals	All site crews
TBT 28	Segregation of waste	Regular Intervals	All site crews
TBT 29	Storage of waste	Regular Intervals	All site crews
TBT 30	Energy efficiency	Regular Intervals	All site crews
TBT 31	Void space	Regular Intervals	All site crews
TBT 32	Waste hierarchy	Regular Intervals	All site crews

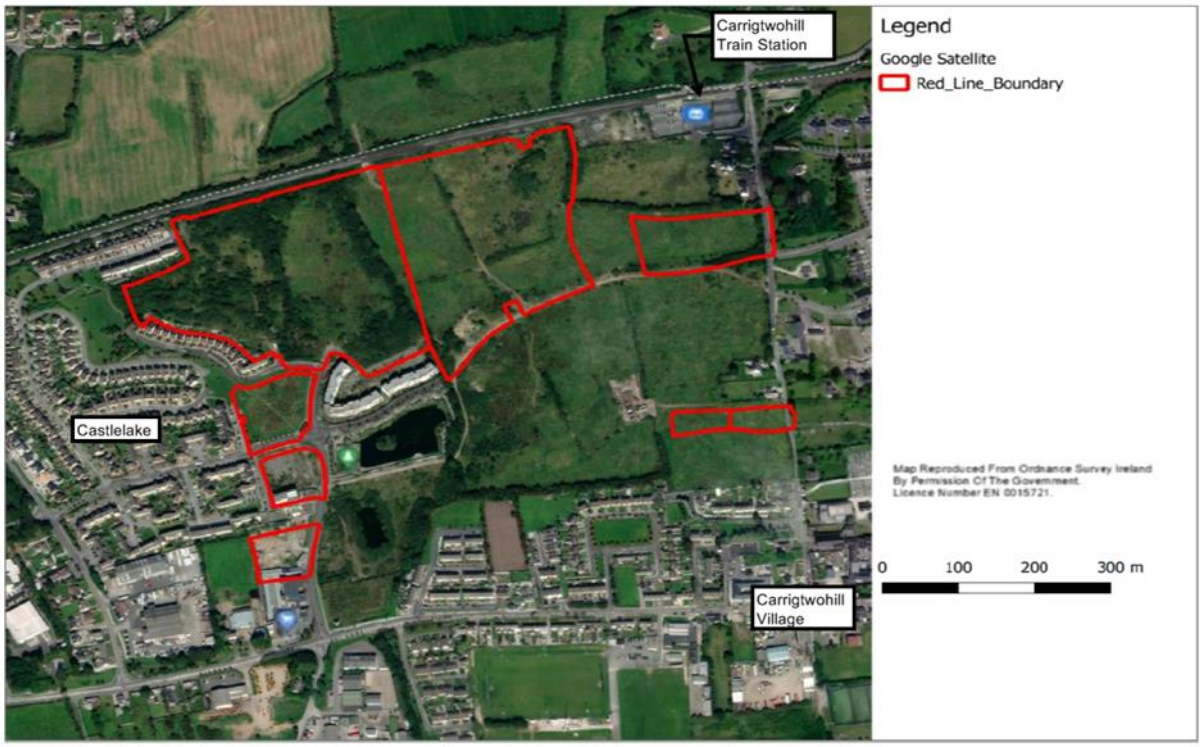
Appendix 1: Table of requirements for ISO14001:2015

Ref	ISO14001:2015	EMP	Section
5.2	Environmental Policy	Company Environmental Policy	Appendix 5
6.1.2	Environmental aspects	Environmental planning, aspects and control Site Environmental Risk Assessment	5 5.1
6.1.3	Compliance obligations	Relevant Statutory Provisions	6.5
		Contract Requirements/ ERA	Appendix 2 & 3
6.2 6.2.1 6.2.2	Environmental objectives and planning to achieve them	Environmental objectives and targets	7
5.3	Organizational roles, responsibilities and authorities	Organisation & Responsibilities	2.1 2.3
7.2 7.3	Competence and awareness	Training and competence	10
7.4	Communication	Environmental Management Arrangements Communication	3 2.2
7.5.3	Control of documented information	Control of Documents	6.7
8.1	Operational planning and control	Environmental Control Measures	8
8.2	Emergency preparedness and response	Summary of emergency procedure	4
9.1	Monitoring, measurement, analysis and evaluation	Environmental management	3.1
9.1.2	Evaluation of compliance	Environmental compliance requirements	6
10.2	Nonconformity and corrective action	Environmental incidents	3.2.2
9.2	Internal audit	Environmental management	3.1
9.3	Management review	Management Review	9

Appendix 2: Table of contractual requirements for environmental management

EMP Section	Section/ Clause

Appendix 3: Site map/s



Appendix 4: Environmental policy

The organisation promotes a responsible and proactive approach to environmental and waste management at every level of the business and on all sites of operation.

BAM Building recognise that business aims must be balanced against environmental considerations. We are committed to continually improving our environmental performance and managing our operations to minimise potentially adverse impacts on the environment.

Specifically, where it is within the organisation's control or influence, BAM Building will:

Identify the significant environmental aspects of our activities by assessing their potential impact on the environment.

Based on our significant environmental aspects, set specific objectives and targets, against which we shall monitor and review our performance.

Comply with legal and other requirements that are applicable to our activities and relevant to the environmental aspects of the business.

Develop management processes and procedures that prevent pollution, protect native species and habitat, minimise waste generation, promote recycling and the use of recyclable materials, and maximise the efficient use of material and energy resources. In order to enable Ireland to fully decarbonise the construction sector, BAM commit to encouraging the use of EPD's.

Implement strategies to communicate our environmental commitments and requirements to employees, customers, suppliers, subcontractors and other interested parties.

Provide training and support to employees, so they understand and can fulfil their responsibilities with regard to environmental impact and performance.

It is the individual responsibility of all persons working for or on behalf of BAM Building to support and apply the Environmental Policy and Environmental Management System as it pertains to their activities.

T. Cullinane , CEO
Date: May 2021

Environmental Emergency Plan

Site Name: Castlelake SHD, Carrigtwohill, Co. Cork

Revisions

Environmental Dept. Revision No: 01 27th May 22			
Reason for Issue:	Planning Permission		**Client Approval (if required)**
Originator	**Reviewer**	**Approver**	
Donal Keohane	Tim Finn	O Ryan	

Circulation

Copy	Circulation	Name	Company	Location
1	Construction Director	Ger Moloney	BAM	Little Island
2	Contract Manager	Ollie Ryan	BAM	Little Island
3	Project Manager	Tim Finn	BAM	Site
4	Site Agent	TBC	BAM	Site
5	General Foreman	Seamus Treacy	BAM	Site
6	Site Health, Safety & Environmental Officer	Donal Keohane	BAM	Site
7	Co. Environmental Coordinator	Elaine Maloney	BAM	Head Office, Kill

TABLE OF CONTENTS

Tables

1. INTRODUCTION

This Environmental Emergency Plan (EEP) has been developed in accordance with BAM Contractors Environmental Procedures. The controlled copy of all environmental procedures is hosted on SharePoint.

This Plan is a working document, clearly stating the arrangements in place to manage the significant environmental aspects and legal requirements of this project. This Plan covers BAM Building activities and that of its subcontractors.

This Plan has been approved by BAM HSE Department at Kill and has the commitment of the Project Director, Project Manager and Site Teams to fulfil the requirements of the Plan.

1.1. Purpose of the plan

This EEP describes how BAM will manage environmental emergencies for Castlelake SHD.

This EEP has been developed within the framework of the BAM Contractors EMS. The BAM Contractors EMS is certified to ISO 14001:2015.

This Plan will:

- Identify the emergency processes required to take control of an emergency
- Maintain a state of preparedness to prevent or reduce injury to personnel or the environmental as a result of an emergency that may occur on site or in an office
- Minimise property loss or damage to the environment.

This procedure will be updated when additional hazards are identified and controls of the same are required

This plan will be sent to all subcontractors prior to commencing on site.

1.2. Project description

The development will consist of the construction of a strategic housing development of 716 no. units and a 2 no. storey creche. The proposed development comprises 224 no. houses, 284 no. duplex units and 208 no. apartments. The two storey houses comprise 48 no. detached, 126 no. semi-detached and 50 no. terraced Houses containing 60 no. two bed units, 139 no. three bed units and 25 no. four bed units. The part-one to part-three storey duplex units are contained in 122 no. buildings providing 82 no. one bed units, 142 no. two bed units and 60 no. three bed units. There are 7 no. apartments blocks ranging in height from part-1 to part- 5 no. storeys.

- Block 1 is 4 no. storeys and contains 34 no. units (7 no. one bed units, 19 no. two bed units and 8 no. three bed units).

- Block 2 is part-1 to part-5 no. storeys and contains 42 no. units (15 no. one bed units, 20 no. two bed units and 7 no. three bed units).
- Block 3 is 5 no. storeys and contains 17 no. units (8 no. one bed units and 9 no. two bed units).
- Block 4 is 4 no. storeys and contains 13 no. units (6 no. one bed units and 7 no. two bed units).
- Block 5 is 4 no. storeys and contains 13 no. units (6 no. one bed units and 7 no. two bed units).
- Block 6 is 4 no. storeys and contains 13 no. units (6 no. one bed units and 7 no. two bed units).
- Block 7 is 5 no. storeys over basement and contains 76 no. units (23 no. one bed units, 41 no. two bed units and 12 no. three bed units).
- All blocks contain ancillary internal and external resident amenity space.

The proposed development also provides for: hard and soft landscaping; boundary treatments; public realm works; car parking; bicycle stores and shelters; bin stores; lighting; plant rooms; and all ancillary site development works above and below ground. The application site is positioned to the north-west of the centre of Carrigtwohill comprised of a series of land parcels with a combined area of 18.3 hectares.

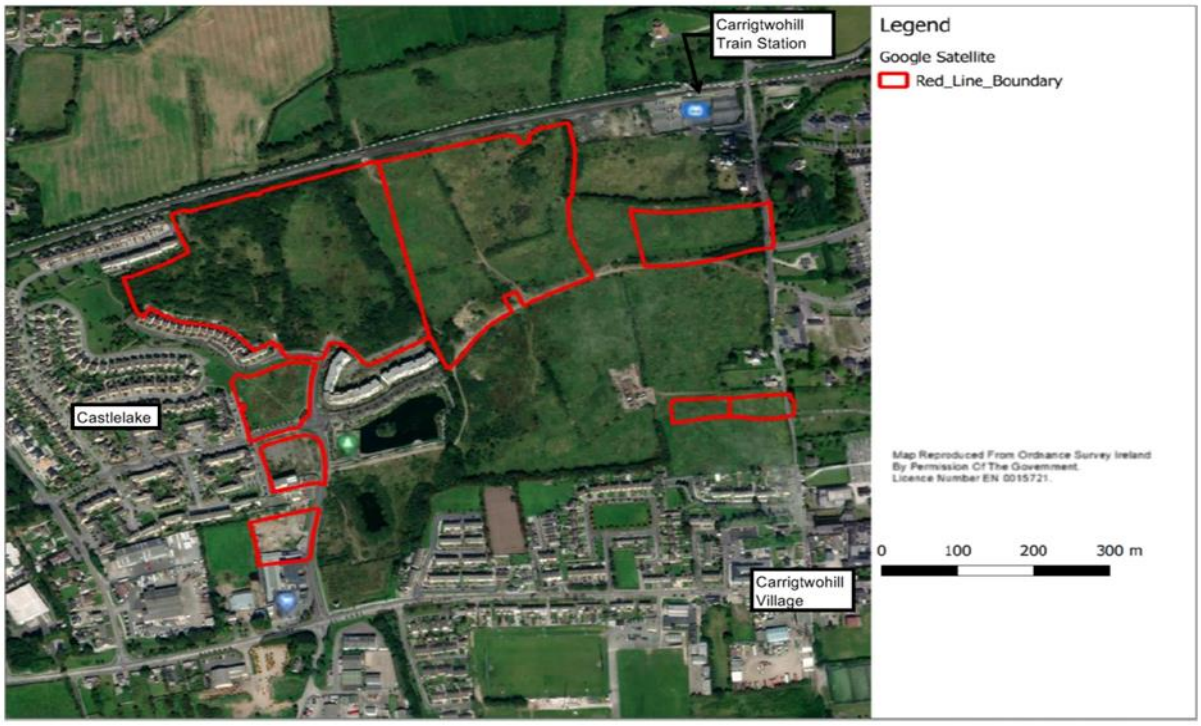
1.3. Site location

Castlelake SHD, Carrigtwohill, Co. Cork

The subject site is located 16km east of Cork City. It is a satellite town that has grown from a small village/hamlet situated along the side of the N25 main road between Cork and Waterford cities. The proposed development site is located circa 50m west of Carrigtwohill village. The site is bounded by agricultural lands to the North, Castlelake housing estate to the west and the Cork Road L3680 to the south. The site is accessed from the Cork Road L3680. Access is also possible from the west via the Castlelake housing estate. The N25 can be accessed to the west and east.

The proposed development bounds the Cork-Midleton Railway line to the north. Carrigtwohill train station is located to the north-east of the site. The train station serves Midleton and Cobh to the east and south and Cork to the west, with onward links to Dublin and the rest of the Country.

The new Glounthaune to Midleton Greenway will pass to the south of the site providing an alternative commuter link to Cork and Midleton and providing an amenity for existing and future residents and visitors. An east-west link road is currently nearing completion along the Southern boundary of the main land block. A north-south link road is proposed to join with an existing rail underpass.



1.4. Working hours

Working hours are in accordance with the Planning Conditions and Environmental Legislation in that we will operate between Monday to Friday 08:00 – 19:00hrs and on Saturdays 08:00 – 13:00hrs.

1.5. Plan objectives

The objective of this EEP is to seek to enhance the protection of the environment and human health in environmental emergency situations by promoting prevention and ensuring preparedness, response and recovery.

1.6. Update and review

This plan will be updated at a minimum of six-monthly intervals unless significant changes take place in works being undertaken on site. Environmental aspects (water/chemicals/fire)

1.7. Water (surface and groundwater) controls

Water pollution or sediment release will be treated as follows:

- Measures described in *EP-23 Emergency Procedure for Sediment Release* will be implemented

- *EP-10 Surface Water Control* and *EP-15 Containing & Cleaning Up Spills* will be adhered to
- All leaks or flows will be contained immediately
- Where the risk of flooding may arise, additional steps will be taken to ensure all filtration methods or silt ponds are checked regularly to ensure no build-up of water / materials increases the risk of flooding and possible contamination
- Environmental Incident reported to the HSE Department and all incidents must be submitted on the BIM Incident Tracking system within seven days.

1.8. Chemical/Hazardous substance controls

Chemical / hazardous substance spills should be treated with great care:

- Person discovering the spill must raise the alarm immediately
- Main environmental controller must be informed and will then decide if the spill/leak can be dealt with internally or whether the emergency services must be called (**112 or 999**)
- Only minor spills will be dealt with using absorbent material available
- The area must be evacuated, and this procedure carried out promptly
- If a chemical or hazardous substance has come in contact with a person you can contact the NATIONAL POISON CENTRE ON (01) 8092166 for advice on first aid treatment
- Environmental Incident reported to HSE Department, and all incidents must be submitted on the BIM Incident Tracking system within seven days.

1.9. Fire

In the event of a fire, the following emergency steps must be followed:

- Persons discovering a fire must raise the alarm immediately. Immediately contact a member of the BAM Management Team
- The offices or area effected must be evacuated
- Only minor fires will be dealt with, if safe to do so, using fire extinguishers or fire blankets
- In cases of major fires or chemical fires, the emergency services must be contacted (***112 or 999***)
- If tackling a minor fire, ensure there is enough suitable firefighting equipment in place
- Employees must be trained to use firefighting equipment
- Redundant fire water must not be allowed to enter surface water areas (*connected sewerage systems must be protected from our construction site run off as per environmental procedures*)
- Fire drills must be carried out on site and in offices every six months.

Please see below for the following types of extinguishers and their uses:

Table 1: Extinguishers

Type	Use
Water fire extinguishers	Cloth, paper and wood fires only
Dry powder	Most fires including electrical fires
CO_2	Electrical fires and flammable liquids
Foam	Class A fires such as paper, wood and cloth

2. SAFETY AND SPILL CONTROL PROCESSES

2.1. Personnel safety

Personnel safety measures with regards to spills includes:

- Immediately alerting area occupants to evacuate area if necessary
- If a volatile, flammable material has been spilled, switch off or remove any sources of ignition close to the spill. Ventilate the area if indoors
- Put on personnel protective equipment, as appropriate to the substance spilled. As a minimum, gloves and goggles must be worn. Gloves and goggles will be available in the spill kit (*replenish spill kits when required*)
- Consider the need for respiratory protection. Never enter a contaminated atmosphere without training or use a respirator without training.

2.2. Spill control and clean up

Spill control and clean up measures include:

- Identify the source of the pollutant and, if possible and safe to do so, stop the flow
- Get a spill kit(s) and apply absorbent materials appropriate to the spill type. Ensure that waste containers are available in which to place used absorbents
- Prevent the spill from spreading and contain it in as small an area as possible, using absorbent sausages, sand, earth or polythene to damn the flow. Divert any flow away from drains, sewers or watercourses or prevent pollutants from entering drains by placing sausages and/or polythene around or over the opening
- If any pollutant has entered water system, absorbent booms must be positioned on the water. If there is not enough flow in the water to push the pollutant into the boom you may need to apply absorbent pads to the surface to soak up the pollutant
- If an oil interceptor is located nearby, any oil or oil/water mixture may be pumped into this, as long as the capacity of the interceptor is not exceeded, and we have permissions
- Place used absorbent pads and shovel contaminated sand/earth/absorbent granules into sacks or containers. Store large volumes of contaminated soil/material in a contained impervious area, such as a plastic-lined bund
- Used absorbent pads / sausages / booms that are not fully laden with pollutant (*i.e. not dripping when they are held up*) may be stored in appropriate containers for reuse. Any such containers must be sealed and clearly labelled as to their contents and stored in a bunded area.

3. ENVIRONMENTAL INCIDENTS/DEFINITIONS

3.1. Environmental incident definitions

Major environmental incident: any situation which has resulted in significant pollution requiring high level of resources for response and remedy and must therefore be reported to Site/Company Management, the Client and/or any relevant statutory authority.

Minor environmental incident: any situation which has resulted in environmental pollution which requires minimal action to aid recovery from Site/Company Management. Non-reportable to any relevant statutory authority.

Main environmental incident controller: takes responsibility for control of the emergency, contacting emergency services and maintains a continuous review of possible developments (*has received fire extinguisher training and spill control advice as a minimum*).

An environmental incident may include but it not limited to:

- Spillage of hazardous materials (as defined by the Waste Management Acts,)
- A breach of any specified environmental limits as detailed in contractual documents or EIS documents (noise, vibration, air)
- Uncovering contaminated land
- Any spillage which cannot be rapidly contained and controlled, these include diesel, oil spills etc
- Inappropriate disposal of waste
- Runoff of sediment-laden or otherwise polluted water to a waterway
- Spills of fuel, oil or hazardous substances into water or a waterway
- Hazardous waste mixed with non-hazardous waste or stored in an inappropriate manner
- Mixing of hazardous wastes
- Concrete waste/washings disposed in a non-designated area
- Working within a protected area.

3.2. Emergency response procedure process

In the event of a **major** *or* **minor** environmental incident occurring, BAM will immediately:

- Clean up spill as per Section 3.2 of this Plan (*if applicable*)
- Isolate the source of any such emission / pollution
- Identify and execute measures to prevent / minimise the emissions / malfunction and the effects thereof
- Evaluate the environmental pollution, if any, caused by the incident
- Corrective actions taken to remedy the situation

- Carry out an investigation to identify the nature, source and cause of the incident and any emission arising there from
- All related information will be gathered concerning the environmental incident and photographs will be taken
- All relevant parties will be spoken with regarding this matter
- When all the information has been gathered, it will be added to the BIM Incident Tracking system. If any further actions have to be taken, these will be agreed, and timescales set.
- All incidents must be submitted on the BIM Incident Tracking system within 7 days.
- All environmental incidents that are added to the Incident Tracking System are reviewed by the HSE department prior to final approval and are included on the monthly 'Loss Events Report'.

This EEP will be communicated to all BAM Personnel and will be reviewed and updated (*where necessary*) on a 6-monthly basis (unless significant change) in conjunction with the EMP and WMP. A spill response drill will also be completed on each site by relevant personnel.

4. REFERENCES

EP-23 Emergency Response for sediment release to water

EP-24 Complaints and Incidents Procedure

EP-15 Containing and Cleaning Up Spills

SP-13 Fire Safety

APPENDIX 3 – Invasive Species Management Plan

MWP

Invasive Species Management Plan

Castlelake Strategic Housing Development (SHD), Carrigtwohill, County Cork

BAM Property

May 2022

Contents

Figures

Project No.	Doc. No.	Rev.	Date	Prepared By	Checked By	Approved By	Status
22461	6007	A	May 2022	OS	MS	AR	DRAFT

MWP, Engineering and Environmental Consultants
Address: Park House, Bessboro Road, Blackrock, Cork, T12 X251
www.mwp.ie

1. Introduction

A Planning Application is being lodged to Cork County Council by BAM Property for a Strategic Housing Development at Castlelake, Carrigtwohill, Co. Cork (hereafter referred to as the 'proposed development site'). Permission is being sought for the construction of 716 No. residential units with childcare facility, landscaped spaces, and associated works and services (hereafter referred to as the 'proposed development').

During an ecological survey site visit in August 2021 in relation to the preparation of a report to inform the appropriate assessment screening ("AA screening report"), the following invasive species were identified within the redline boundary of the proposed development site:

- Himalayan balsam (*Impatiens glandulifera*);
- Japanese rose (*Rosa rugosa*)

Of these invasive plants, Himalayan balsam (*Impatiens glandulifera*) is listed species on the Third Schedule to the European Communities (Birds and Natural Habitats) (regulations 49 and 50). The best practice management measures for Himalayan Balsam are detailed in Section 4.

Japanese rose (*Rosa rugosa*) is an Amber List species, a species which may impact on the conservation goals of the Water Framework Directive (WFD), though is not a species listed under the Third Schedule. Best practice management of this species is detailed in Section 5.

All general bio-security measures described in Section 4.3 of this Invasive Species Management Plan (ISMP) will be implemented before any construction or enabling works commence for the proposed development project. Species-specific eradication measures outlined in this document will be in process at the earliest possible time within the works plan, in accordance with the required timings of the specified control measures (growing season, seed dispersal timings etc.).

2. Site Location and Description

The proposed development site is located circa 500m northwest of Carrigtwohill village. The site is bounded by agricultural lands to the north, Castlelake housing estate to the west and the Cork Road L3680 to the south. The site is accessed from the Cork Road L3680. Access is also possible from the west via the Castlelake housing estate. The N25 can be accessed to the west and east.

The proposed development bounds the Cork-Midleton Railway line to the north. Carrigtwohill train station is located to the northeast of the site. The train station serves Midleton and Cobh to the east and south and Cork to the west, with onward links to Dublin and the rest of the country.

The new Glounthaune to Midleton Greenway will pass to the south of the site providing an alternative commuter link to Cork and Midleton, providing an amenity for existing and future residents and visitors. An east-west link road is currently under construction along the southern boundary of the main land block. A north-south link road is proposed to join with an existing rail underpass. A site location map is provided in Figure 1 below.

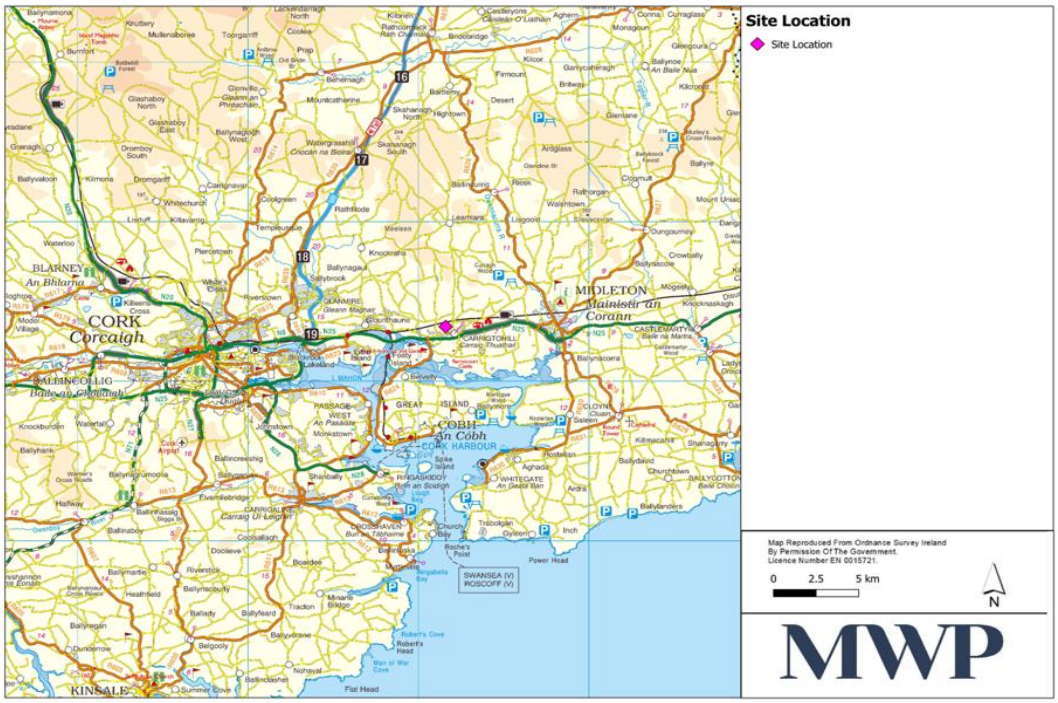


Figure 1: Proposed Development Site Location

The proposed development is relatively flat with the highest elevation of the proposed development being *ca.* 9m AOD. The predominant CORINE (2018) landcover at the proposed development is classified as 'Agricultural Areas/Pastures' with some sections at southwest of site made up of 'Artificial Surfaces – Discontinuous urban fabric'.

According to the online Geological Survey Ireland (GSI) online mapper, the proposed development site is underlain by massive unbedded lime-mudstone from Walsortian Limestones formation at the southern end and Dark muddy limestone, shale of the Ballysteen Formation at the northern end.

Subsoil at the proposed development is classed as 'Sandstone till (Devonian)'. The majority of the aquifer is designated as Regionally Important Aquifer – Karstified (diffuse) with a section at the northern end which is categorised as 'Locally Important Aquifer – Bedrock which is Moderately Productive only in Local Zones'. The groundwater vulnerability of the aquifer is stated as stated mostly as 'moderate' with small sections of the north side of the proposed development designated as 'high'. The GSI define groundwater vulnerability as "…a term used to represent the intrinsic geological and hydrogeological characteristics that determine the ease which groundwater may be contaminated by human activities"

The proposed development is located within the 'Lee, Cork Harbour and Youghal Bay' Water Framework Directive (WFD) catchment (Code:19) and the Tibbotstown_SC_010 sub-catchment. This catchment includes the area drained by the River Lee and all streams entering tidal water in Cork Harbour and Youghal Bay and between Knockaverry and Templebreedy Battery, Co. Cork, draining a total area of 2,153km².

There are a number of waterbodies on site. The Woodstock stream is the largest stream which enters the eastern-most land block near Station Road and flows in a westerly direction before turning south where it flows into the Slatty Pond, which is hydrological connected Great Island SAC (001058) and Cork Harbour SPA (004030). Another small stream bisects the main land block and flows in a southerly direction towards the Woodstock Stream at the southwest of the site.

There is a man-made lake (attenuation pond/lagoon) to the south of the main land block which is currently used as an amenity by local residents. The pond has an overflow into the Woodstock Stream.

The Woodstock Stream joins with a transitional waterbody named Slatty Pond which is located just east of the Slatty Bridge, approximately 900m southwest of the closest point of the proposed development. This transitional water flows under Slatty Bridge, into Slatty Water and on to Lough Mahon (Harpers Island), another transitional waterbody.

Data from the EPA's Water Framework Directive (WFD) monitoring depicts the Lough Mahon as having 'moderate' water quality (2013-2018). There is no WFD monitoring data for Slatty Bridge or any of the waterbodies on or leaving the site. The Woodstock Stream is not a designated salmonoid river and is not in an area designated for Freshwater pearl Mussel. The EPA has classed Lough Mahon (Harpers Island) as being 'At risk' of failing to meets its WFD objectives.

Field surveys undertaken by MWP ecologists for the Carrigtwohill Sustainable Housing Development Appropriate Assessment Screening Report, identified sixteen habitat types across the site:

1. Amenity Grassland (GA2);
2. Amenity Grassland x Ornamental/Non-native Shrub (GA2 x WS3);
3. Amenity Grassland x Scattered Trees and Parkland (GA2 x WD5);
4. Buildings and Artificial Surfaces (BL3);
5. Immature Woodland x Scrub (WS5 x WS1);
6. Improved Agricultural Grassland (GA1);
7. Improved Agricultural Grassland x Scrub (GA1 x WS1)
8. Recolonising Bare Ground (ED2);
9. Recolonising Bare Ground x Buildings and Artificial Surfaces x Scrub (ED3 x BL3 x WS1);
10. Recolonising Bare Ground x Buildings and Artificial Surfaces (ED3 x BL3);
11. Recolonising Bare Ground x Dry Meadows and Grassy Verges (ED3 x GS2);
12. Recolonising Bare Ground x Dry Meadows and Grassy Verges x Scrub (ED3 x GS2 x WS1);
13. Scrub (WS1);
14. Spoil and Bare Ground (ED2);
15. Drainage Ditch (FW4); and
16. Hedgerow x Treeline (WL1 x WL2)

The surveys identified that extents of habitat dominated by Immature Woodland x Scrub, Improved Agricultural Grassland x Scrub, as well as Hedgerow and Treeline habitat have become colonized by the invasive plant species Himalayan balsam. This area coincides with the planned project area thus careful consideration regarding its immediate removal and future management must be considered.

2.1 Designated Sites

The site itself is not within a Natura 2000 site. However, the site is located close to the Cork Harbour SPA (site code: 004030) and the Great Island Channel SAC (Site code: 001058), located 708m and 772m to the south, respectively (see **Figure 2**).

Figure 2: Location of SACs and SPAs in relation to site location

The eradication and management measures for the invasive alien plant species detailed in this report will not result in significant impacts on any Natura 2000 site.

2.2 Extent of Himalayan Balsam at the Site

Himalayan balsam (*Impatiens glandulifera*) is a member of the Balsaminaceae family. It is a fast growing, and spreads quickly along watercourses where it can form in dense thickets.

Himalayan balsam, as the name suggests, is native to the Himalaya mountains and was originally introduced in Ireland as an ornamental garden plant. It can grow up to 3m in height in a single season and produces bright pink flowers. Himalayan balsam is also a rich source of nectar which attracts pollinators such as bumblebees. The species is found on waterways and damp woodlands throughout Ireland. Himalayan balsam produces thousands of seeds per plant which are released explosively when disturbed, propelling seeds up to 7 meters from the plant. Seeds remain viable up to 18 months and can be transported by wind and water making the Himalayan balsam a rapid coloniser.

As outlined in Section 2, large areas of the immature woodland and scrub habitat and hedgerow and woodland habitat present in the site have become colonised by Himalayan balsam (*Impatiens glandulifera*), see Plate 1Error! Reference source not found. and Plate 2Error! Reference source not found. below.

The immature woodland and scrub habitat in the western area of the site, as well as the hedgerow and treeline habitat and drainage ditch habitat in the centre of the site are the main locations of the Himalayan balsam (*Impatiens glandulifera*) (see Figure 3).

Plate 1: Photograph showing Himalayan balsam at the site

Plate 2: Photograph showing Himalayan balsam at the site

Figure 3: Showing areas of Himalayan balsam (*Impatiens glandulifera* – green hatching) within and adjacent to site and Japanese Rose location (*Rosa rugosa*) within the site redline boundary (pink circle)

2.3 Extent of Japanese Rose at the Site

Japanese rose (*Rosa rugosa*) is a species of rose native to East Asia which is tolerant of salt spray. This unique feature allows it to grow in sandy coastal areas, where it can alter dune formation, as well is in hedgerows and road verges where it can quickly dominate native species therefore reducing biodiversity.

The species produces bright red or purple-pink flowers as well as fruit and was introduced primarily due to its attractive appearance (see Plate 3); it is very common in gardens and in amenity areas. Though initially considered to have been spread for ornamental purposes and through animals, a key vector of spread from gardens is via improper material disposal from gardens or through escape to wild areas via gardens. Japanese rose flowers in June – July and fruits in autumn though is deciduous therefore is more difficult to identify in winter months. Slender thorns and upright stems are a distinguishing feature of this species when compared to other rose species.

The extent of Japanese rose within the redline boundary is relatively limited and isolated, only occurring at the north western boundary (see Figure 3).

Plate 3: Japanese rose (*Rosa rugosa*) and fruit noted at site during ecology survey

3. Legislative Background

The Wildlife Act 1976-2018 (herein the Wildlife Acts) contain provisions relating to non-native invasive species. Regarding exotic species, it is prohibited for anyone without a license to plant or otherwise cause to grow in a wild state, in any place in the State, any species of flora, or the flowers, roots, seeds or spores of flora. The Minister may also issue regulations prohibiting possession or introduction of any species of wild bird, animal or flora, or any part, product or derivative of such wild bird, wild animal or wild flora which may be detrimental to native species (NRA, 2010). The Wildlife Acts do not contain specific provisions that directly govern invasive species control or removal, however it is stated within the legislation that "anyone who plants or otherwise causes to grow in the wild – in any place in the State any species of (exotic) flora, or the flowers, roots, seeds or spores of (exotic) flora shall be guilty of an offence."

Furthermore, Regulation (EU) 1143/2014 on invasive alien species (herein the "IAS Regulation") was agreed by the European Council on 22nd October 2014 and came into force in August 2016. This IAS Regulation conveys the rules to prevent, minimize and mitigate the adverse impacts of the introduction and spread (both with and without intention) of invasive alien species on biodiversity and the related ecosystem services, as well as other adverse impacts on human health or the economy (European Commission, 2017). Target 4.4 of Ireland's National Biodiversity Action Plan 2017-2021 (DCHG, 2017) is that "harmful invasive alien species are controlled and there is reduced risk of introduction and/or spread of new species".

4. Himalayan Balsam *(Impatiens glandulifera)* Eradication

4.1 Best Practice Management Measures

Himalayan balsam (*Impatiens glandulifera*) is listed on the Third Schedule of the Birds and Habitats Regulations and is considered a high-risk invasive species, which has the ability to create competition for resources such as pollinators, light and space, posing a threat to native plant species.

In line with guidance published by the National Roads Authority, now Transport Infrastructure Ireland (The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads, 2010) the following control options were identified:

Option 1 – Physical control: Physical removal should be attempted where the ground is level and good access is possible. In the circumstances, plants can be strimmed, cut, or mown back to ground level before flowering in June. The plant should be cut as low as possible, or at least below the lowest node, otherwise re-spouting will occur. Any mechanical removal of Himalayan balsam before June will promote greater seed production in re-growth. The area should be mown regularly to prevent sprouting and flower formation and repeated annually until area is under complete control.

Hand pulling is also another effective method of removal given the shallow rooting of Himalayan balsam. Hand pulling should be repeated in August to deal with sprouting of seeds. Plant material can be disposed of via compost, though due to potential presence of seeds, disposal of landfill or disposal by burning may be favourable.

Option 2 – Chemical control: Effective control of Himalayan balsam using chemical application of glyphosate or 2, 4-D amine applied during the active growth phase in late spring targeting germinating seedlings. However, it should be noted that glyphosate is a broad-spectrum herbicide so care should be taken when applying amongst sensitive species or adjacent to waterbodies where there should be a buffer zone of no chemical application, according to the product instructions.

Grasses are unaffected by glyphosate; therefore, chemical control may be preferable in circumstances wherein grass types are present. Guidelines recommend repeat treatments for five or more year. Ongoing monitoring of the site will also be required in spring and summer to assess seedling presence and possible further control measures.

4.2 Proposed Measures for Eradication of Himalayan Balsam at Carrigtwohill

It is recommended that a combination of the options outlined above is undertaken to eradicate and avoid the spread of the plant both within and outside of the site. The proposed measures are outlined in the following section.

Due to the extensive nature of the established Himalayan balsam on site, existing plants will be mowed to ground level before flowering occurs in June and where ground is level. Hand-pulling methods may also be employed during the pre-flowering season and is most effect following rainfall. Pulled and mown sites will be revisited in August for follow-up pulling. Stockpiled material should be removed, covered and fenced off, to prevent any further spread of seeds on site. Works will be undertaken always using a single designated piece of machinery, e.g., one strimmer, mower, cutter etc. Vegetation material removed via physical controls should be disposed of via landfill or burning to remove risk of by propagation by seeds. Coincidentally, chemical control measures may be employed in late April to May, during the active growth phase in late spring, using glyphosate. The chemical treatment may be applied using foliar spray, wiper application or spot treatment. Areas treated with glyphosate will require retreatment in later summer months to target seedling germination and again annually for ongoing control. Given the extensive nature of Himalayan balsam at the site, it is recommended that follow up monitoring

is undertaken on the site and spraying of regrowth carried out as necessary. Further to the above, toolbox talks will be carried out to communicate measures to all personnel involved.

4.3 Biosecurity Measures

In addition to the above, the following biosecurity measures will be implemented:

- Any vehicles/plant operating within the infested areas will be cleaned thoroughly when entering and / or leaving the exclusion zones.
    - Designated wash-down areas will be set up within the exclusion zone, and away from drains and watercourses; plant/equipment will be washed down on geotextile membrane, so that any potential contaminated material will be contained.
    - Vehicles will be cleaned of all earth and loose sediments, with particular attention paid to tyre treads, wheel arches and hinged joints.
    - The minimum amount of machinery possible will be used to minimise the potential spread of the species.
    - All tools, materials and work wear will be inspected, and cleaned as necessary, with particular attention paid to footwear and hand tools.
- Work boots will be dipped in or scrubbed with a disinfectant solution and thoroughly dried afterwards before being used on the site for the first time;
- PPE and tools will remain on site for the duration of construction;
- All PPE will be visually inspected and any attached vegetation or debris removed.

5. Japanese Rose

5.1 Best Practice Management Measures

Though not a species listed under Third Schedule, control of Japanese rose to prevent its spread within the area should be implemented to avoid inadvertent propagation of this species. Physical removal of the entire plant, at both small- and large-scale infestations, is recommended. Chemical control using herbicide is also an effective control.

5.2 Proposed Measures for Eradication of Japanese Rose at Carrigtwohill

Physical removal of the plant by hand-pulling is effective for small populations but roots and rhizomes must also be removed to prevent recolonisation. Hand-pulling can be combined with application of glyphosate. Applications of the herbicide can be made with brush to avoid affecting other plants. As per chemical control of Himalayan balsam, use of herbicide must be fully in keeping with manufacturer instructions and with consideration to appropriate buffer zones when adjacent to water bodies. Follow up monitoring and treatment will be necessary to ensure full long-term eradication (Weidema, 2006).

5.3 Biosecurity Measures

Japanese rose is suspected to disperse via rhizomes, water and seeds within fruit. Therefore, a similar protocol as that described in Section 4.3 should be employed when removing Japanese rose.

6. Other Considerations

The landscape plan for the site which is being developed separately must have regard to Invasive Species Ireland's Amber list. Planting schedules must not include species on these lists, as they may have invasive properties which would be detrimental to the overall biodiversity of the site.

7. References

Department of Culture, Heritage and the Gaeltacht. (2017). National Biodiversity Action Plan 2017 – 2021.

EPA. (2019). Water Quality in Ireland 2013-2018. Environmental Protection Agency, Wexford Ireland, 102 pp.

European Commission. (2017). Invasive Alien Species of Union Concern. Vol 1. Luxembourg: Publications Office of the European Union.

Fossitt, J.A., (2000) A Guide to Habitats in Ireland. The Heritage Council, Kilkenny.

National Roads Authority. (2010). Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads. Revision 1; pp 43-44.

Weidema, I. (2006): NOBANIS – Invasive Alien Species Fact Sheet – *Rosa rugosa*. – From: Online Database of the European Network on Invasive Alien Species – NOBANIS www.nobanis.org, Date of access 26/05/2022.