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Member of the SNC-Lavalin Group

Carrigtwohill to Midleton Inter-urban Cycleway Phase 2

Appropriate Assessment Screening Report

Cork County Council

19/12/2023

Notice

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Document history

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1. Introduction

1.1. Background

WS Atkins Ireland Ltd ("Atkins") was appointed by Cork County Council to prepare, on its behalf, an Appropriate Assessment (AA) Screening Report in respect of the proposed Carrigtwohill to Midleton Inter-urban Cycleway Phase 2 ("the proposed development"). The proposed development comprises an off-road, safe cycling and walking facility between Carrigtwohill and Midleton and is not directly connected with or necessary to the management of any designated site for nature conservation.

This report comprises the AA Screening Report in respect of the proposed development and is intended to assist Cork County Council, in its capacity as the competent authority, by providing it with sufficient evidence to make a properly informed determination as to whether or not Appropriate Assessment under Article 6(3) of the Habitats Directive (92/43/EEC) is required.

1.2. Legislative Context

1.2.1. Natura 2000

Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora ("the Habitats Directive") is a legislative instrument of the European Union (EU) which provides legal protection for habitats and species of Community interest. Article 2 of the Directive requires the maintenance or restoration of such habitats and species at a favourable conservation status, while Articles 3 to 9, inclusive, provide for the establishment and conservation of an EU-wide network of special areas of conservation (SACs), known as Natura 2000, which also includes special protection areas (SPAs) designated under Article 4 of Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds ("the Birds Directive"). Both SACs and SPAs are commonly referred to as "European sites" or "Natura 2000 sites".

SACs are selected for natural habitat types listed on Annex I to the Habitats Directive and the habitats of species listed on Annex II to the Habitats Directive. SPAs are selected for species listed on Annex I to the Birds Directive, other regularly occurring migratory species and other species of special conservation interest. The habitats and species for which a Natura 2000 site is selected are referred to as the "qualifying interests" of that site and each is assigned a "conservation objective" aimed at maintaining or restoring its "favourable conservation condition" at the site, which contributes to the maintenance or restoration of its "favourable conservation status" at national and European levels.

1.2.2. Appropriate Assessment

Article 6 of the Habitats Directive deals with the management and protection of Natura 2000 sites. Articles 6(3) and (4) set out the decision-making process, known as "Appropriate Assessment" (AA), for plans or projects in relation to Natura 2000 sites. Article 6(3) states: -

> *"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 subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the 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."*

The first sentence of Article 6(3) provides a basis for determining which plans and projects require AA, i.e., those "*not directly connected with or necessary to the management of [one or more Natura 2000 sites] but likely to have a significant effect thereon, either individually or in combination with other plans or projects*". In *Waddenzee* (C-127/02), the Court of Justice of the European Union (CJEU) ruled that significant effects must be considered "likely" if "*it cannot be excluded, on the basis of objective information*", that they would occur. This clearly sets a low threshold, such that AA is required wherever there is a reasonable possibility of significant effects on a Natura 2000 site. In the same judgment, the CJEU established that the test of significance relates specifically to the

conservation objectives of the site concerned, i.e., "significant effects" are those which, "*in the light, inter alia, of the characteristics and specific environmental conditions of the site*", could undermine the site's conservation objectives. In addition to the effects of the plan or project on its own, the combined effects arising from the plan or project under consideration and other plans and projects must also be assessed (see Section 7.1 for more details).

The last part of the first sentence of Article 6(3) defines AA as an assessment of the "*implications [of the plan or project] for the site in view of the site's conservation objectives*". In the second sentence, Article 6(3) requires that, prior to agreeing to a plan or project, the competent authority must "ascertain" that "*it will not adversely affect the integrity of the site concerned*". In *Sweetman v. An Bord Pleanála* (C-258/11), the CJEU ruled that a plan or project "*will adversely affect the integrity of that site if it is liable to prevent the lasting preservation of the constitutive characteristics of the site that are connected to the presence of a priority natural habitat whose conservation was the objective justifying the designation of the site in the list of sites*". On that basis, EC (2018) described the "integrity of the site" as "*the coherent sum of the site's ecological structure, function and ecological processes, across its whole area, which enables it to sustain the habitats, complex of habitats and/or populations of species for which the site is designated*". As such, the "integrity" of a specific site is defined by its conservation objectives and is "adversely affected" when those objectives are undermined. In *Waddenzee*, the CJEU ruled that the absence of adverse effects can only be ascertained "*where no reasonable scientific doubt remains*".

The "precautionary principle" applies to all of the legal tests in AA, i.e., in the absence of objective information to demonstrate otherwise, the worst-case scenario is assumed. Where the tests established by Article 6(3) cannot be satisfied, Article 6(4) applies (see explanation in Section 1.3 below).

1.2.3. Competent Authority

The requirements of Articles 6(3) and (4) are transposed into Irish law by, inter alia, Part 5 of the European Communities (Birds and Natura Habitats) Regulations, 2011 (as amended) ("the Habitats Regulations") and Part XAB of the Planning and Development Act, 2000 (as amended) ("the Planning and Development Acts"). As per the second sentence of Article 6(3), it is the "competent national authorities" who are responsible for carrying out AA and, by extension, for determining which plans and projects require AA. The competent authority in each case is the authority responsible for consenting to or licensing a plan or project, e.g., local authorities, An Bord Pleanála, the Environmental Protection Agency (EPA) or a Government Minister. In all cases, it is the competent authority who is ultimately responsible for determining whether or not a plan or project requires AA and for carrying out the AA, where required.

1.3. Appropriate Assessment Process

The AA process can be described as being made up of three distinct stages, as described below, the need to progress to each stage being determined by the outcome of the preceding stage.

Stage 1: Screening – This stage involves a determination by the competent authority as to whether or not a given plan or project required AA. As explained in Section 1.2 above, AA is required in respect of any plan or project not directly connected with or necessary to the management of a Natura 2000 site, but for which the possibility of likely significant effects on one or more Natura 2000 sites cannot be excluded. In *People Over Wind* (C-323/17), the CJEU ruled that measures intended to avoid or minimise harmful effects on a Natura 2000 site cannot be considered in making this determination. Consideration of the potential for in-combination effects is also required at this stage.

Stage 2: Appropriate Assessment – This stage involves a detailed assessment of the implications of the plan or project, individually and in combination with other plans and projects, for the integrity of the Natura 2000 site(s) concerned. This stage also involves the development of appropriate mitigation to address any adverse effects and an assessment of the significance of any residual impacts following the inclusion of mitigation. In *Kelly v. An Bord Pleanála* (IEHC 400), the High Court ruled that a lawful AA must contain complete, precise, and definitive findings based on examination and analysis, and conclusions and a final determination based on an evaluation of the findings. In the same judgment, the High Court stressed that, in order for the findings to be complete, precise, and definitive, the AA must be carried out in light of best scientific knowledge in the field and cannot have gaps or lacunae. In *Holohan v. An Bord Pleanála* (C-461/17), the CJEU clarified that AA must "*catalogue the entirety of habitat types and species for which a site is protected*" (i.e. the qualifying interests of the site) and assess the implications of the plan or project for the qualifying interests, both within and outside the site boundaries, and other, non-qualifying interest habitats and species, whether inside or outside the site boundaries,

"*provided that those implications are liable to affect the conservation objectives of the site*". The proposer of a plan or project requiring AA is furnishes the competent authority with the scientific evidence upon which to base its AA by way of a Natura Impact Statement (NIS) or Natura Impact Report (NIR). If it is not possible to ascertain that the plan or project will not adversely affect one or more Natura 2000 sites, authorisation can only be granted subject to Article 6(4).

Stage 3: Article 6(4) – If a plan or project does not pass the legal test at Stage 2, alternative solutions to achieve its aims must be considered and themselves subject to Article 6(3). If no feasible alternatives exist, authorisation can only be granted where it can be demonstrated that there are imperative reasons of overriding public interest (IROPI) justifying its implementation. Where this is the case, all compensatory measures must be taken to protect the overall coherence of Natura 2000.

The three stages described above are illustrated in Figure 1-1 below.

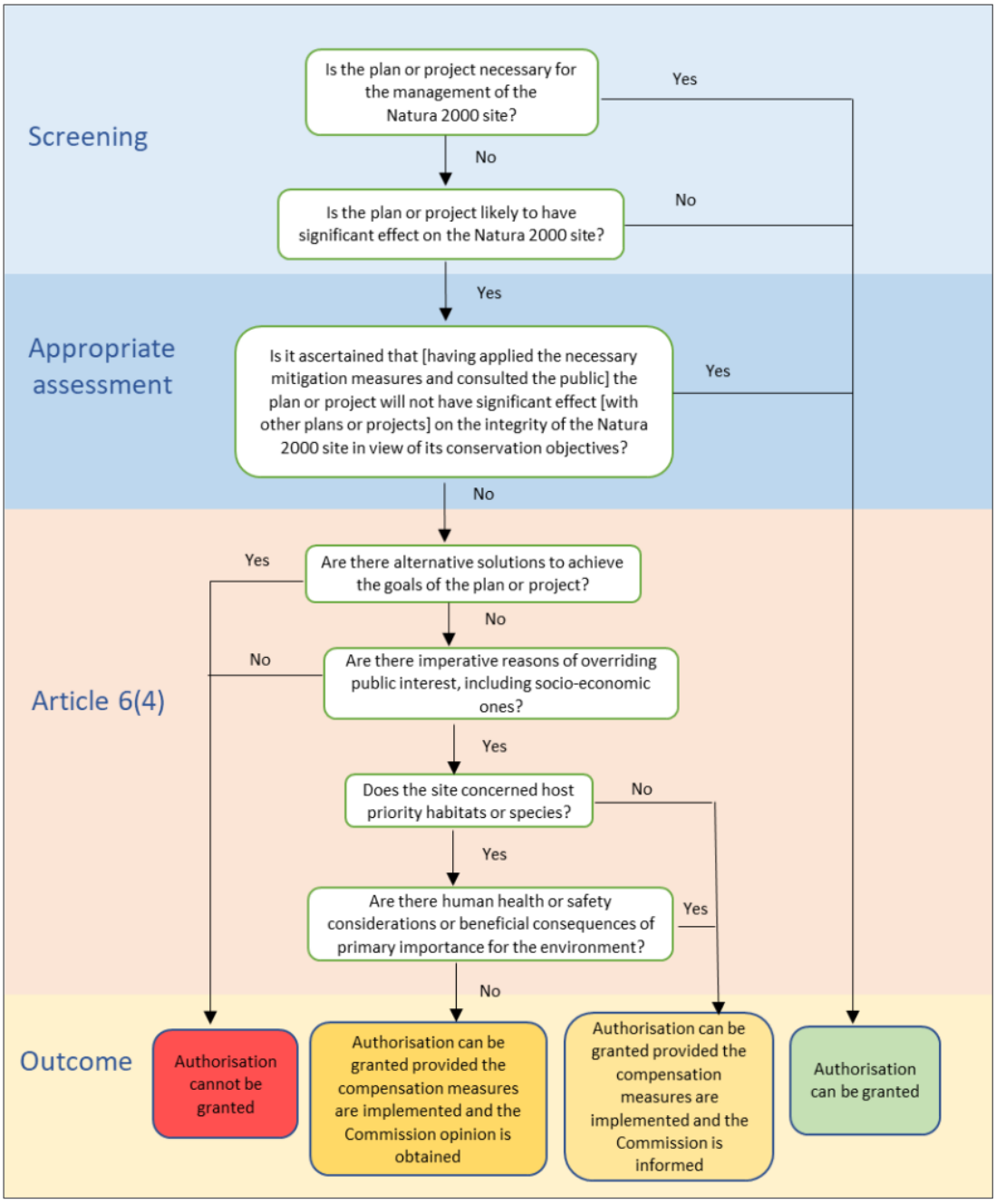

Figure 1-1 - Stages of the Appropriate Assessment process (EC, 2021).

2. Methodology

2.1. Sources of Guidance

This report was prepared with due regard to the relevant European and Irish legislation, case law and guidance, including but not limited to: -

- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild flora and fauna. *Official Journal of the European Communities* L 206/7-50.
- Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds. *Official Journal of the European Union* L 20/7-25.
- European Communities (Birds and Natural Habitats) Regulations, 2011. *S.I. No. 77/2011* (as amended) ("the Habitats Regulations").
- Planning and Development Act, 2000. *No. 30 of 2000* (as amended) ("the Planning and Development Acts").
- National Parks & Wildlife Service: *Development Consultations* webpage (NPWS, 2023a).
- EC (2019). *Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC.* European Commission, Brussels.
- EC (2021). *Assessment of plans and projects in relation to Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC.* European Commission, Brussels.
- DEHLG (2010a). *Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities. Revised 11/02/2010.* Department of the Environment, Heritage and Local Government, Dublin.
- DEHLG (2010b). *Circular NPW 1/10 & PSSP 2/10. Dated 11/03/2010.* Department of the Environment, Heritage and Local Government, Dublin.
- OPR (2021). *Appropriate Assessment Screening for Development Management. OPR Practice Note PN01.* Office of the Planning Regulator, Dublin.
- Case law, including *Waddenzee* (C-127/02), *Sweetman v. An Bord Pleanála* (C-258/11), *Kelly v. An Bord Pleanála* (IEHC 400), *Commission v. Germany* (C-142/16), *People Over Wind* (C-323/17), *Holohan v. An Bord Pleanála* (C-461/17), *Eoin Kelly v. An Bord Pleanála* (IEHC 84), *Heather Hill* (IEHC 450) and *Eco Advocacy v. An Bord Pleanála* (C-721/21).

2.2. Desk Study

Baseline data regarding the receiving environment, including Natura 2000 sites, was gathered through a thorough desk study. The locations and boundaries of Natura 2000 sites in relation to the proposed development were reviewed on the National Parks & Wildlife Service (NPWS) *Designations Viewer* (NPWS, 2023b). Information on the qualifying interests and the structures and functions of the relevant Natura 2000 sites was found in the Site Synopsis, Natura 2000 Standard Data Form, Conservation Objectives and supporting documents for each site. Reporting under Article 17 of the Habitats Directive (NPWS, 2019a-c; ETC/DB, 2022a) and Article 12 of the Birds Directive (NPWS, 2023c; ETC/BD, 2022b) provided further information on the habitats and species concerned at the national level.

Spatial and other data regarding rivers and other waterbodies were obtained from the Environmental Protection Agency (EPA) using its online facility *EPA Maps*. Spatial data for other features of the natural environment were viewed on the *ESM Webtool*. Information relating to recent and historical records of species was obtained from

the National Biodiversity Data Centre (NBDC) *Biodiversity Maps* and via a data request to the NPWS. In addition, reports listed below relating to other proposed developments whose study areas partly overlapped that of the cycleway were also reviewed for relevant information, having due regard to the *Advice note on the lifespan of ecological reports and surveys* (CIEEM, 2019):

- Limosa (2015). *Preliminary Ecological Appraisal for the Carrigtwohill North Masterplan Site. RP15-GW102-02.* Report by Limosa Environmental.
- Atkins (2018). *Water Rock Urban Expansion Area Infrastructure Works. Ecological Impact Assessment. November 2018.* Report by WS Atkins Ireland Ltd for Cork County Council.
- Greenleaf Ecology (2020a). *Ecological Walkover Survey, Carrigtwohill URDF Initiative, Carrigtwohill, Co. Cork.* Report by Greenleaf Ecology for WS Atkins Ireland Ltd and Cork County Council.
- Greenleaf Ecology (2020b). *Bat Survey, Carrigtwohill URDF Initiative, Carrigtwohill, Co. Cork.* Report by Greenleaf Ecology for WS Atkins Ireland Ltd and Cork County Council.
- Atkins (2021a). *Carrigtwohill to Midleton Inter-urban Cycleway Phase 1. Environmental Impact Assessment Screening Report. November 2021.* Report by WS Atkins Ireland Ltd for Cork County Council.
- Atkins (2021b). *Carrigtwohill to Midleton Inter-urban Cycleway Phase 1. Screening for Appropriate Assessment. November 2021.* Report by WS Atkins Ireland Ltd for Cork County Council.
- Atkins (2021c). *Carrigtwohill to Midleton Inter-urban Cycleway Phase 1. Ecological Impact Assessment. November 2021.* Report by WS Atkins Ireland Ltd for Cork County Council.
- Gittings, T. (2023). *Carrigtwohill Waterbird Survey, November 2022 - February 2023. Report No. 2227-F1, Revision 1, dated 20/03/2023.* Tom Gittings PhD MCIEEM for WS Atkins Ireland Ltd on behalf of Cork County Council.
- Atkins (2023a). *Carrigtwohill URDF Initiative. Appropriate Assessment Screening Report. May 2023.* Report by WS Atkins Ireland Ltd for Cork County Council.
- Atkins (2023b).. *Carrigtwohill URDF Initiative. Ecological Impact Assessment. May 2023.* Report by WS Atkins Ireland Ltd for Cork County Council.
- Atkins (2023c) *Carrigtwohill URDF Initiative. UEA Infrastructure - Environmental Impact Assessment Screening Report. May 2023.* Report by WS Atkins Ireland Ltd for Cork County Council.

2.3. Field Surveys

A preliminary walkover of the route of the proposed cycleway was undertaken by Atkins ecologist Owen O'Keefe on 8th April 2023. The purpose of this walkover was to highlight any major ecological constraints at an early stage and to determine the scope of ecological surveys required.

Multi-disciplinary surveys were undertaken by Atkins ecologists Owen O'Keefe and Caroline Downey, covering the eastern half of the proposed development on 29th June 2023 and the western half on 3rd July 2023. These surveys included: -

- classifying habitats within the study area using *A Guide to Habitats in Ireland* (Fossitt, 2000),
- identifying habitats with potential links to natural habitat types listed on Annex I to the Habitats Directive ("Annex I habitats"),
- compiling comprehensive botanical lists for each habitat,
- identifying and mapping invasive alien species (IAS), especially legally restricted IAS such as Japanese Knotweed, and

- recording direct observations or evidence of protected or threatened species, whether mammals, birds, reptiles, amphibians or invertebrates, or suitable habitats, especially potential breeding or resting places, for such species.

Bat surveys were carried out by Karen Banks MCIEEM of Greenleaf Ecology. These surveys included walkovers to identify suitable foraging and commuting habitat, assessment of potential roost features, activity transects, passive monitoring, and dusk emergence surveys at potential roost features. Full details of the bat surveys are provided in the report cited below, which is presented in Appendix A to this EcIA.

- Greenleaf Ecology (2023) *Bat Survey, Carrigtwohill to Water Rock Inter-Urban Cycle Route - Phase 2, Co. Cork.* Report by Greenleaf Ecology for WS Atkins Ireland Ltd and Cork County Council.

The above site visits were conducted following the most appropriate and most recent guidelines available at the time of survey and reporting, including: -

- NRA (2009b). *Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes.* National Roads Authority, Dublin.

- Smith, G.F., O'Donoghue, P., O'Hora, K. and Delaney, E. (2011). *Best Practice Guidance for Habitat Survey and Mapping.* The Heritage Council, Kilkenny.

- Collins, J. (ed.) (2016). *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition).* Bat Conservation Trust, London.

In addition, the results of ongoing (July to October 2023) pre-works surveys for bat roosts, non-volant mammals and invasive alien plant species in relation to Work Package 7 of the Water Rock UEA Infrastructure Works (along the Water Rock Road) were also taken into account, where relevant.

2.4. Impact Assessment

The assessment detailed in this report was undertaken in the following steps, following the best practice guidance highlighted in Section 2.1 above: -

1. Description of the proposed development, including its location and extent, nature, scale, duration, and potential impacts on the natural environment.

2. Description of baseline conditions in the receiving environment, focussing on habitats, species, ecological corridors, and any known threats, pressures, and activities.

3. Establishment of a Zone of Influence, and identification and description of Natura 2000 sites therein.

4. Identification of source-pathway-receptor chains between the proposed development and the qualifying interests of Natura 2000 sites, and evaluation of effects in view of the relevant conservation objectives.

5. Consideration of the potential for significant effects in combination with other plans and projects.

6. Conclusion and recommendation.

Further details of the methodology and the rationale behind it are provided in the relevant sections.

2.5. Statement of Authority

This report has been prepared by Caroline Downey and Owen O'Keefe, and peer-reviewed by Paul O'Donoghue.

Caroline Downey is a Graduate Environmental Consultant holding a BSc (Hons) in Ecology and Environmental Biology from University College Cork. Caroline has worked in ecological consultancy since 2023. The focus of Caroline's work to date has included assisting with the preparation of Ecological Impact Assessments, AA Screening Reports and NIS, as well as site visits. Caroline collated the information from the previous surveys and reporting, assisted with the 2023 site walkover and prepared this report.

Owen O'Keefe is a Senior Ecologist at Atkins. Owen holds a BSc (Hons) in Ecology from University College Cork (2015) and is a Full Member of the Chartered Institute of Ecology and Environmental Management (MCIEEM). He has 8 years' professional experience in ecological consultancy, specialising river ecosystems and Appropriate Assessment. Owen undertook the 2023 walkover and provided support to Caroline in the preparation of this report.

Paul O'Donoghue is an Associate Director (Ecology) at Atkins. Paul holds a BSc (Zoology), MSc (Behavioural Ecology) and a PhD in avian ecology and genetics. Paul is a Chartered member of the Society for the Environment (CEnv) and a full member of the Chartered Institute of Ecology and Environmental Management (MCIEEM). Paul has over 18 years' experience in ecology; including extensive experience in the preparation of Habitat Directive Assessments/Natura Impact Statements (i.e., Appropriate Assessment under the Habitats Directive). Paul carried out the technical review of this report.

3. Proposed Development

The description of the proposed development provided here is taken from Sections 4 and 5 of the *Part 8 Planning Application Report* (Atkins Doc. Ref. 5194601DG0224), where full details can be found.

3.1.1. Overview

The proposed development comprises a section of inter-urban cycle route running to the north of Carrigtwohill and connecting the Inter-urban Cycleway Phase 1 with the Water Rock Services Corridor Link Road Cycleway. It forms part of the cycle route connecting Midleton to Dunkettle, which is proposed in the Cork Metropolitan Area Transport Strategy 2040 (CMATS). This inter-urban route (IU-1) will connect major employment centres such as Little Island (10,000+ employees) and Carrigtwohill IDA Business Park (3,800 employees) with existing and proposed residential areas including in Carrigtwohill, Midleton, Glanmire and Glounthaune.

The proposed development is a high-quality, predominantly off-road cycling and walking facility that is c. 3.7km long, with c. 66m as a shared street (with a very low vehicular traffic) and the rest as a segregated path from vehicular traffic. In addition, the proposed development includes: -

- 1 no. pedestrian/cyclist underpass (at existing overpass agricultural road),
- 4 no. at-grade road crossings,
- Traffic calming measures on existing roads,
- Potential for native planting corridor, and
- Public lighting.

The route is designed to interface with and is compatible with new infrastructure planned in the Carrigtwohill UEA and the Water Rock UEA.

3.1.2. Proposed Design

The proposed route is divided into 4 no. sections as shown in Figure 1-1 below. These sections are described in summary below with further detail provided in the Part 8 drawings.

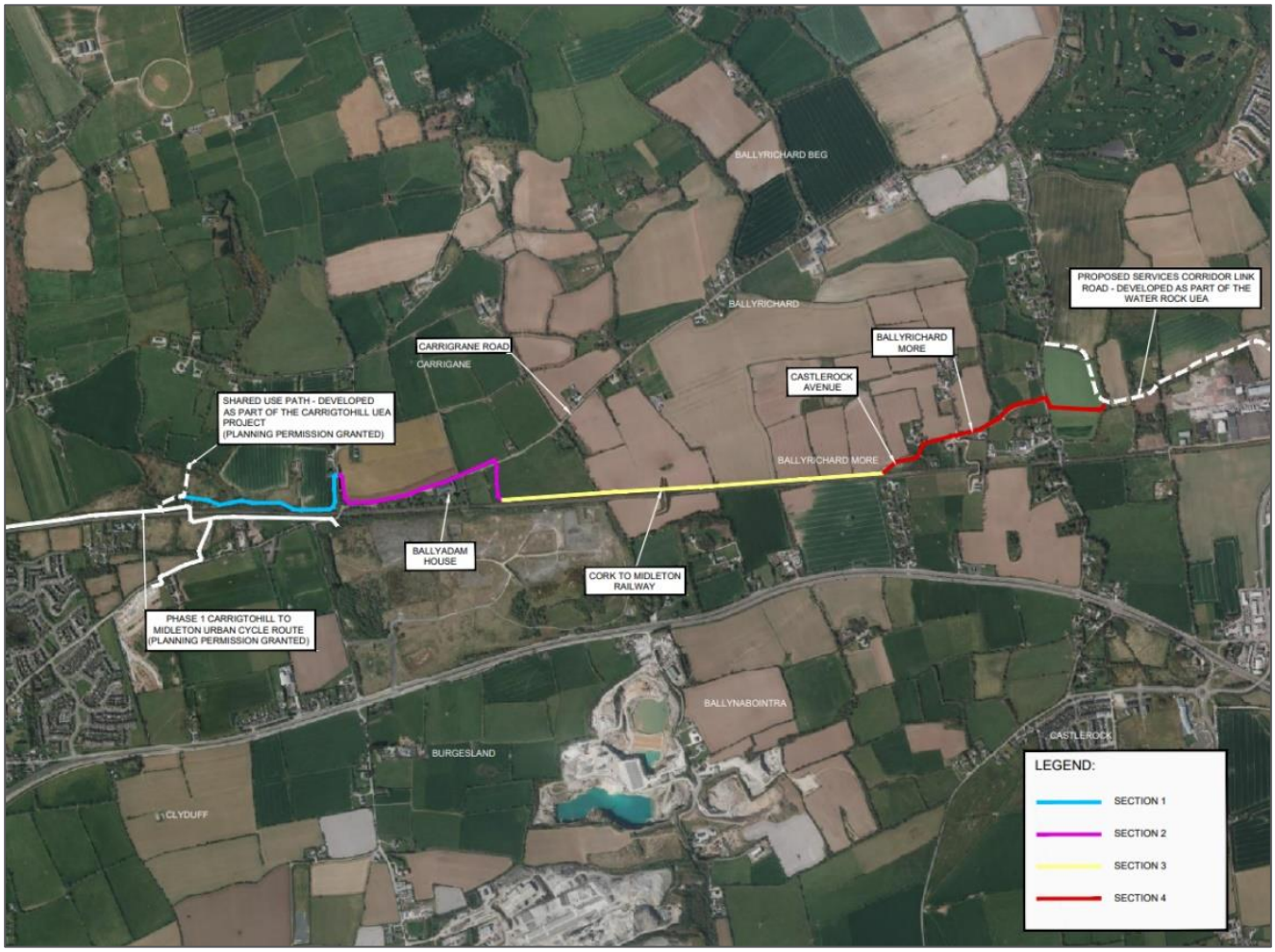

Figure 3-1 - Overall layout of the proposed development.

Section 1: Connection to Phase 1

The cycleway commences just north of the Cork to Midleton Railway Line within lands zoned for the Carrigtwohill Urban Expansion Area (UEA). The route connects to Phase 1 via a short link of active travel infrastructure being developed as part of the Carrigtwohill URDF Initiative – UEA Infrastructure. The Part 8 Planning Application for the UEA Infrastructure was published by Cork County Council in June 2023 with a decision expected by October 2023. The connecting active travel link, being integral to the development of Phase 2, will thus be constructed in tandem with or ahead of the Phase 2 route.

The route will then be accessible from Phase 1 via the abovementioned link, before continuing in an easterly direction and running in parallel with the railway line. The alignment along this section is fairly straight, with minor changes in direction to avoid any impact to dense outcrops of vegetation while keeping to field boundary lines in general. The existing field boundaries along this section will be maintained with sections of hedgerow planted along a new fence line.

The route then turns northwards as it approaches Ballyadam Road Junction. The route continues northwards parallel to Ballyadam Road for a short section until adequate sight lines are achieved for a safe at-grade crossing. At this point, an uncontrolled raised table crossing will be provided, with a coloured surface texture. The proposed crossing point will include street lighting to improve visibility of pedestrians and cyclists, including traffic calming measures e.g. rumble strips and road signage to reduce the speed of approaching vehicles. The crossing point will require the removal of sections of existing hedges within the Ballyadam Road verge to provide adequate sight lines to cyclists and pedestrians, as indicated in the Part 8 Drawings.

New ducting will be provided to the road crossing on Ballyadam Road to facilitate connection of street lighting.

A nature-based surface water drainage system involving a combination of over-the-edge drainage and swales will be provided along Section 1. Surface water run-off will be directed to the grassed verge on one or both sides of the cycleway where water will infiltrate to ground. This will be augmented by the provision of a linear planted swale in the northern verge. A collector pipe in the swale will convey excess water and discharge it to an existing drainage ditch. Discharge will be limited to greenfield run-off rates via check dams in the swale and a flow control device if required. The drainage ditch discharges to the Poulaniska stream north of the railway line.

Existing natural vegetation and trees that will be removed as part of the works will be replaced by similar or suitable native planting, semi-mature trees and shrubs.

Section 2: Carrigane Road

From its crossing point on Ballyadam Road (N), the cycleway continues its east-west alignment north of and parallel to the Carrigane Road with the existing hedgerow maintained as a buffer between the road and cycle route. The buffer area will also include a grassed verge of 3m. Agricultural lands form a boundary on the northern side of the route. A new hedge will be planted inside a new fence line to screen these lands from the cycle route. This will also act as a wind break for cyclists.

The alignment then proceeds southwards with an at-grade road crossing proposed on Carrigane Road, provided to the east of Ballyadam House. The crossing location will consist of a signalised toucan crossing with new street lighting to improve visibility of pedestrians and cyclists. The crossing location will include traffic calming measures in the form of rumble strips and road signage to reduce the speed of approaching vehicles. The crossing point will require the removal of the existing hedgerow within the northern road verge to facilitate adequate sight lines for cyclists and pedestrians, as indicated in the Part 8 drawings. New ducting will be provided for the street lights and signal infrastructure.

The southern alignment passes through an agricultural field with an existing stone boundary wall. A length of c. 10m of the wall will be demolished to allow the cycle lane to pass through. The route proceeds southwards through the field before re-joining the general railway line alignment, proceeding in an easterly direction.

To the north of Carrigane Road, a nature-based surface water drainage system involving a combination of over-the-edge drainage and swales will be provided. Surface water runoff will be directed to a grassed verge on one or both sides of the cycleway where water will infiltrate into the ground via a linear planted swale.

Over-the-edge drainage is proposed south of the crossing of Carrigane Road. Again, a planted swale with check dams will collect water in the verge and allow it to infiltrate to ground. Excess water will be conveyed to an additional sustainable drainage systems (SuDS) feature such as a rain garden i.e. a planted depression provided at the lowest point on the field.

Section 3: North of Cork to Midleton Railway Line

In Section 3 the cycle route follows the railway line along an east-west axis keeping to agricultural field boundaries. Trees will be planted along the northern field boundary, while maintaining the hedgerow to the south along the railway line. Approximately halfway through Section 3, the route crosses an existing agricultural overpass which facilitates farm activity across the railway line. Given the proximity of the cycle route to the railway line at this point, it was necessary to create an underpass beneath the embankment of the overbridge to maintain a straight cycle route. A cross-sectional profile of the underpass is provided in Figure 1-2 below. The proposed underpass will be a minimum of 10m from the existing overpass abutments.

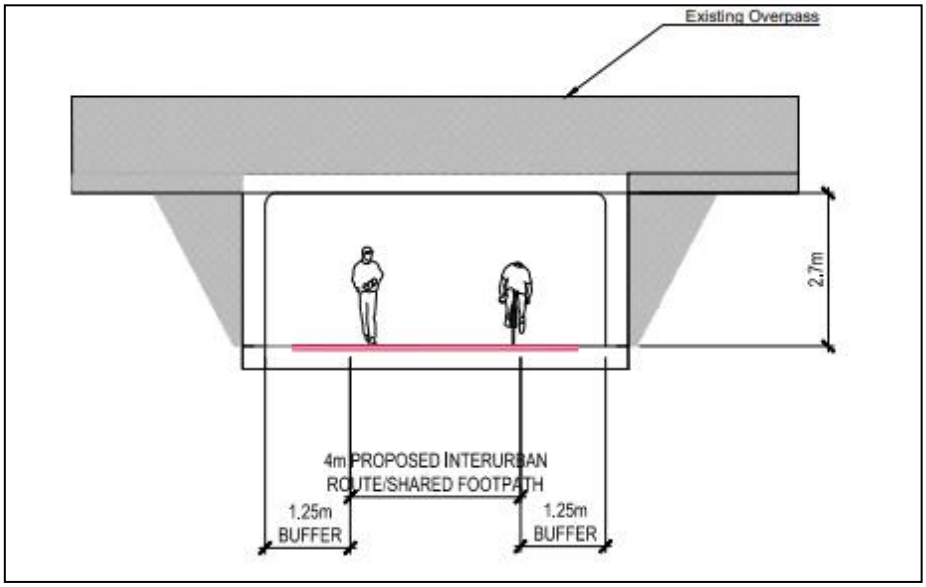

Figure 3-2 - Typical cross-section through the proposed underpass.

Nature-based over the edge drainage is again proposed along this section. Again, a planted swale with check dams will collect water in the verge and allow it to infiltrate to ground. Excess water will be conveyed to an additional SuDS feature such as a rain garden i.e. a planted depression provided at the lowest point on the field.

Section 4: Ballyrichard More Road

The cycle route deviates slightly from the railway line once it meets an existing access track to the west of the Ballyrichard More Road, which accommodates minor farm movements. The route continues as a segregated cycle lane adjacent the farm track before proceeding northwards along Ballyrichard More Road. The short northern section of road that provides access to 3 no. private properties will be re-surfaced and converted to a 4m wide shared street, where cyclists will have priority over vehicle movements. The shared street will be denoted by road signage and road markings.

The cycle route will then continue off road, and to the north of Ballyrichard More Road following agricultural field boundaries. An at-grade raised crossing is proposed at the junction with Castle Rock Avenue. The route then crosses the Water Rock stream, above the existing culvert structure, thus removing the need for an additional water crossing or works within the stream. The route continues across Water Rock Road, with an at-grade crossing provided just north of its junction with Ballyrichard More Road.

An uncontrolled raised table crossing will be provided. The existing streetlights will be enhanced by new lighting columns provided at the junction, and may require additional ducting. Traffic calming measures in the form of rumble strips and road signage will be included.

From this point, the route crosses through the hedgerow/treeline, a section of which will be removed to ensure adequate sightlines are provided for pedestrians and cyclists crossing. The route then emerges at the Water Rock Urban Expansion Area (UEA), where it joins the planned Services Corridor Link Road.

The route running parallel to the farm track will include a grassed verge allowing water to infiltrate to ground. Any excess surface water will be directed to the lowest point of the field on the adjacent Section 3 where various SuDS features including a rain garden are proposed. The existing over-the-edge drainage system will be retained along the shared-use section. The detailed design will ensure there is no increased risk of flooding to adjacent properties. The cycleway running parallel to Ballyrichard More Road will be sloped towards the grassed verge on the southern side. A perforated large collector pipe will be provided in this verge. This will collect and attenuate excess run-off in the verge. This pipe will connect to the existing drainage system on Ballyrichard More Road. Discharge will be limited to greenfield run-off rates. The road drainage system connects to the Water Rock Stream. The section crossing over to the Water Rock UEA lands will comprise a grassed verge with filter drain on the northern side of the cycleway. This filter drain will discharge attenuated flows to the surface water drainage system within the Water Rock Local Infrastructure Housing Activation Fund (LIHAF) Initiative.

Proposed Cross-section

The cross-section of the cycleway, as shown in Figure 1-3 below, will be a minimum of 4m wide with a minimum planted verge of 3m on either side where this is achievable. The path will generally consist of an asphalt surface and will be constructed at-grade or slightly above existing ground levels. The total area of hard surface will be c. 14,850m^2 with drainage as described above.

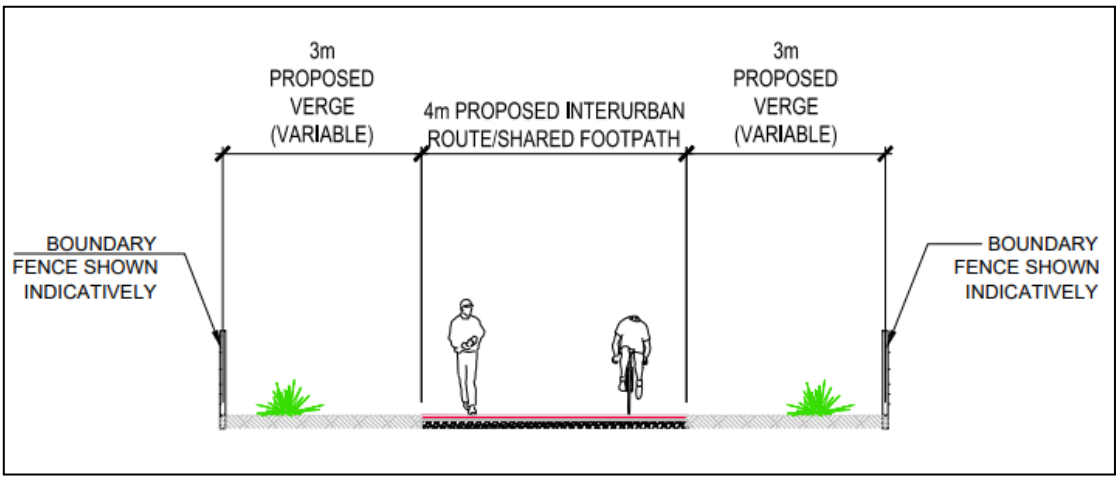

Figure 3-3 - Typical cross-section of the proposed cycling and walking facility.

Street Lighting

Public lighting will be provided at junction crossings to improve the safety and security of all users. The public lighting design will be undertaken in accordance with Cork County Council's Public Lighting Manual and Product Specification 2021 and will include the proposed layout and associated ducting and power supply details. The cycle route itself will include lighting along its length. The design of the lighting system will take into consideration the potential impacts of artificial lighting on bats and other wildlife occurring along the corridor. The design will also take into account the bat roost identified at Ballyadam House as well as foraging and commuting routes such as hedgerows and treelines present in the study area. The lighting design will include low-wattage, warm light consisting of Light Emitting Diode (LED) luminaires and will be directed downward to retain darkness above.

Proposed Landscape Strategy

Ecological considerations have been key factors in the route selection of the inter-urban cycle route. Where possible, the route has been chosen to run parallel and offset from existing hedgerows and treelines so that they can be preserved. In total, it will be necessary to remove approximately 891m of hedgerows/treelines to construct the route. This will be mitigated by the replacement of this with a minimum of 2,281m of new hedgerows/treelines (an increase of 1,390m) aligned to the route as well as new areas of planting in SuDS features throughout.

Planting will be specified by a Landscape Architect under the advice of a suitably qualified and experienced ecologist to enhance local biodiversity value as appropriate for each section of the route. An objective of the planting strategy will also provide amenity value to enhance the cycle route and to provide surface water pollution prevention measures.

3.1.3. Construction Methodology

The works will commence with site clearance and accommodation works. Temporary traffic management including measures for pedestrians and cyclists will be put in place. Trees/vegetation to be retained will be marked and protected and the site boundary will be fenced off. Natural buffer areas on existing watercourses outside of the infrastructure area will be maintained and protected during construction. The site will be cleared of redundant fencing and road signage, street lighting to be replaced and vegetation to be removed. Vegetation clearance will be done in the appropriate season, i.e. outside of the bird nesting season (1st March to 31st August, inclusive).

Underground utilities that conflict with the main works will be uncovered using mechanical excavators and hand digging where appropriate. A utility survey, including slit trenches for verification, will be carried out during the detailed design stage to determine the location of services to the most accurate extent possible. Protection works or any service diversions that are required will be undertaken at this stage.

The route of the cycle/pedestrian path will be excavated to formation/sub-formation level. It is anticipated that generally the maximum excavation depth will be 500mm. Excavation of the topsoil and road verge will largely be undertaken by mechanical means with any spoil arisings to be removed off site or reused locally where testing confirms its suitability. The path will be limited to a 4m wide asphalt path with concrete kerb restraints on either side of the pavement. The new path will be constructed using a bituminous pavement construction in accordance with the TII Specification for Road Works Series 900 – Road Pavements. A 150mm layer of imported stone will be placed and compacted followed by asphalt layers respectively.

At the existing agricultural overpass that crosses the railway line, an underpass with a 6.5m wide clearance will be constructed through the embankment of the existing overbridge to facilitate the cycle route. This will require temporary closure of the overbridge. The area for the underpass will be excavated and a pre-cast concrete box culvert installed. Spoil arisings will be removed offsite or re-used locally where testing confirms its suitability. The overbridge and embankments will be reinstated and the bridge re-opened. Once installation is complete, lighting and surfacing will be installed in the underpass and it will be connected to the rest of the route.

The route passes through an existing stone wall of which approximately 10m will be demolished. Suitable hand tools, alternatively a jack hammer, will be used and the demolished material will be removed as soon as possible. A temporary fence and barricading of the area around the structure will be undertaken to ensure safety of the travelling public along the Carrigane Road.

Where the route crosses the Water Rock stream, west of the Ballyrichard More/Castle Rock Avenue junction, the existing culvert structure will be used, thus eliminating the need for additional construction works or in-stream works associated with a new crossing.

Drainage works will run in tandem with the route construction phase. Drainage will be ‘over-the-edge’ to a filter drain (perforated pipe in gravel trench) running alongside the length of the route, as described in Section 1.2.2.

At grade road crossings of Ballyadam Road, Carrigane Road and Castle Rock Avenue will be constructed under temporary traffic management measures. New road signs, road markings, public lighting columns, traffic signals and bollards will be installed and commissioned where required. Temporary traffic management measures will be removed when appropriate.

Areas of soft landscaping along the route will be top-soiled, seeded and planted following specification by a Landscape Architect working with a suitably qualified and experienced ecologist. Maintenance of new planting will be undertaken by the Contractor for a minimum of two years following completion

4. Receiving Natural Environment

4.1. Desktop Review

4.1.1. Hydrology and Hydrogeology

Surface Waters

The proposed development is within the Water Framework Directive (WFD) Catchment No. 19 'Lee, Cork Harbour and Youghal Bay', with the western part of the route in the 'Tibbotstown' sub-catchment and the eastern part in the 'Owenacurra' sub-catchment.

There are no EPA surface waterbodies in the study area. West of Ballyadam Road, the proposed development crosses the Poulaniska stream and on Ballyrichard More Road it crosses the Water Rock stream. These small streams are described in more detail below. The route also crosses 1 no. isolated drainage ditch which appears to be dry apart from after heavy rain.

Poulaniska Stream

The Poulaniska stream is situated in the western part of the study area and flows in a southerly and south-westerly direction in the vicinity of Poulaniska townland. It is crossed by the proposed development at Ch. 200. It flows south until it is culverted under the railway. It then flows in a south-westly direction for c. 650m. Ordnance Survey Ireland (OSi) maps show the stream ending in the vicinity of a karst system located in the north-east of Carrigtwohill (east of Station Road). It is presumed that the stream enters this karst system, which ultimately discharges to Cork Harbour. During the field surveys for the Carrigtwohill URDF Infrastructure Project in February 2023, this stream and its associated ditches were noted to have been subject to recent re-grading and re-profiling.

West of Ballyadam Road, a drainage ditch runs along the northern boundary of the railway corridor and connects to the Poulaniska stream to the south of the proposed route. This ditch is parallel to the cycleway but outside of the development footprint.

Water Rock Stream

The Water Rock stream is crossed by the proposed development at Ch. 3335, at an existing concrete box culvert carrying the Ballyrichard More Road and associated footpaths across the stream. The stream rises c. 3km north-west of this culvert, near where the townlands of Ballyleary, Lysaghtstown and Woodstock meet and flows in a generally south-easterly direction through Glounamuck Wood and under the Carrigane Road and Ballyrichard More Road before meeting a large limestone outcrop at Water Rock c. 200m downstream from the culvert under Ballyrichard More Road. At this point, the stream enters a karst system and re-emerges c. 600m to the south-east, on the far side of the N25 road. It then flows mostly overground for another c. 1.5km before discharging to the Owenacurra Estuary in the vicinity of the Midleton Wastewater Treatment Plant.

Water quality status in the Water Rock stream is not monitored in its own right, but as part of the Owenacurra river waterbody, the WFD status of which is currently 'Moderate' and 'At risk' of not achieving its objectives by 2027. Similarly, the Owenacurra Estuary transitional waterbody has a WFD status of 'Moderate' is also 'At risk' of not achieving its objectives by 2027.

Groundwater

The proposed development is situated over the Midleton groundwater body. Groundwater vulnerability in the study area varies between 'Moderate' and 'Rock at or near surface or karst'. Water Framework Directive (WFD) groundwater quality status was assessed as 'Good' for the monitoring period 2013-2018.

Karstification is widespread in the Midleton groundwater body and diffuse recharge occurs via rainfall. Shallow groundwater is expected within <10m below the surface, according to the GSI map viewer.

4.1.2. Flora

A search of the NBDC database was undertaken for the 10km × 10km grid square (hectad) W87 for protected flora species. 5 no. threatened plant species as according to Wyse Jackson et al. (2016) were identified, including Dropwort (*Filipendula vulgaris*) and Round-leaved Crane's-bill (*Geranium rotundifolium*) which have an Irish Red List Status of Least Concern; Pale Flax (*Linum bienne*) and Yellow Bartsia (*Parentucellia viscosa*) which have an Irish Red List Status of Near Threatened and finally Cornflower (*Centaurea cyanus*) which is on the Irish Red List Waiting List.

In addition, the NPWS database for the same hectad contains records for 3 no. further species, namely Henbane (*Hyoscyamus niger*) and Knotted Hedge-parsley (*Torilis nodosa*), which are listed as Near Threatened, Weasel's-snout or Lesser Snapdragon (*Misopates orontium*), which is listed as Endangered. The records for Henbane and Lesser Snapdragon all date from the 19th Century and those for Henbane relate to locations on the shore of the Great Island Channel, while that for Knotted Hedge-parsley relates to a location on the far side of Midleton.

4.1.3. Fauna

4.1.3.1. Non-volant mammals.

The NBDC and NPWS databases for hectad W87 contain records for 8 no. species, as listed in Table 4-1 below. All are protected under the Wildlife Act, 1976 (as amended) and listed as Least Concern in Marnell et al. (2019). Otter (*Lutra lutra*) is additionally listed on Annexes II and IV to the Habitats Directive, while Pine Marten (*Martes martes*) and Irish Hare (*Lepus timidus* subsp. *hibernicus*) are listed on Annex V to the Habitats Directive.

Table 4-1 - NBDC and NPWS records for protected and threatened non-volant mammals in hectad W87.

Common Name	Scientific Name
Hedgehog	*Erinaceus europaeus*
Irish Hare	*Lepus timidus* subsp. *hibernicus*
Otter	*Lutra lutra*
Pine Marten	*Martes martes*
Badger	*Meles meles*
Irish Stoat	*Mustela erminea* subsp. *hibernica*
Red Squirrel	*Sciurus vulgaris*
Pygmy Shrew	*Sorex minutus*

4.1.3.2. Bats

All bat species occurring in Ireland are protected under the Wildlife Act and are also listed on Annex IV to the Habitats Directive, affording strict protection to them and their breeding and resting places. Lesser Horseshoe Bat (*Rhinolophus hipposideros*) is further listed on Annex II to the Habitats Directive, requiring the designation of SACs for its conservation. All bat species occurring in Ireland are listed as Least Concern in Marnell et al. (2019). The NBDC database for hectad W87 contains records for 7 no. of Ireland's bat species, and the area has a bat suitability score of 26.89%. A nursery roost of Natterer's Bat (*Myotis nattereri*) is known from Ballynaclashy House, located to the north of the study area, which is designated as a pNHA for this reason.

4.1.3.3. Reptiles & Amphibians

The NBDC and NPWS databases for hectad W87 both contain records for Common Frog (*Rana temporaria*), which is listed on Annex V to the Habitats Directive, protected under the Wildlife Act and listed as Least Concern in King et al. (2011). There are no records for other amphibians or reptiles in the study area.

4.1.3.4. Invasive Alien Plant Species

The NBDC database for W87 contains records 15 no. IAPS, as listed in Table 4-2 below, along with their impact ratings as per O'Flynn *et al*. (2014) and whether or not they are on the EU IAS Regulation or the Third Schedule to the Habitats Directive.

Table 4-2 - NBDC records for invasive alien plant species in hectad W87.

Common Name	Scientific Name	Status
Sycamore	*Acer pseudoplatanus*	Medium-impact
Three-cornered Garlic	*Allium triquetrum*	Medium-impact; Third Schedule
Butterfly Bush	*Buddleja davidii*	Medium-impact
Traveller's Joy	*Clematis vitalba*	Medium-impact
Nuttall's Waterweed	*Elodea nuttallii*	High-impact; EU IAS Regulation; Third Schedule
Japanese Knotweed	*Fallopia japonica*	High-impact; Third Schedule
Bohemian Knotweed (hybrid)	*Fallopia japonica* × *sachalinensis* = *F.* × *bohemica*	High-impact; Third Schedule
Himalayan Balsam	*Impatiens glandulifera*	High-impact; EU IAS Regulation; Third Schedule
Himalayan Honeysuckle	*Leycesteria formosa*	Medium-impact
Cherry Laurel	*Prunus laurocerasus*	High-impact
Douglas Fir	*Pseudotsuga menziesii*	Medium-impact
Turkey Oak	*Quercus cerris*	Medium-impact
Rhododendron	*Rhododendron ponticum*	High-impact; Third Schedule
Narrow-leaved Ragwort	*Senecio inaequidens*	Medium-impact
Common Cord-grass	*Spartina anglica*	High-impact; Third Schedule

4.2. Field Survey

4.2.1. Habitats

The study area is dominated by agricultural grassland and arable crops in large fields separated by hedgerows and treelines, with some areas of more species-rich grasslands, and two small streams. There are also roads, buildings, and other artificial surfaces, as well as gardens and scrub. Habitats identified in the study area are listed in and described in Table 4-3 below and illustrated in the habitat maps shown in Figures 4-1 to 4-4, inclusive, below.

Table 4-3 - Fossitt (2000) habitat types identified in the study area.

Habitat	Description
Non-linear habitats	
BC1	'Arable crops' – Fields of arable crops account for a large share of the agricultural land within the study area. The main crops are wheat (*Triticum aestivum*) and maize (*Zea mays* subsp. *mays*), but there is also some barley (*Hordeum vulgare*). These fields provide forage for a variety of farmland birds and the edges and corners are botanically rich, supporting a wide range of predominantly annual wildflowers (see plant list in Section 3.4.1).
BC2	'Horticultural land' – One large field in the centre of the study area, where there is an existing farm overpass crossing the railway line, is planted with broad bean (*Vicia faba*). Similar to BC1, this field provides some forage farmland birds and the edges and corners are support a range of wildflowers. The high-impact and legally restricted invasive species Japanese Knotweed (*Fallopia japonica*) is present within and around an area of scrub in the centre of this field.
BC3/ED3	The field immediately west of the Ballyadam Road represents BC1 'Arable crops'. However, A c. 10m-wide corridor along the southern and eastern edges of this field was fences off after the area was tilled but before it could be sown. As such, this area now represents a much-widened margin of an arable field, best represented as a transitional habitat between BC3 'Tilled land' and ED3 'Recolonising bare ground'. Species include Common Field-speedwell (*Veronica persica*), Pineappleweed (*Matricaria discoidea*), Common Ramping Fumitory (*Fumaria muralis*), Changing Forget-me-not (*Myosotis discolor*), Wall Speedwell (*Veronica arvensis*), Wild Pansy (*Viola tricolor*), Spear-leaved Orache (*Atriplex prostrata*), Fat Hen (*Chenopodium album*), Lesser Swinecress (*Lepidium didymium*), Field Pansy (*Viola arvensis*), Sun Spurge (*Euphorbia helioscopia*), Common Orache (*Atriplex patula*), Black Bindweed (*Fallopia convolvulus*) and Black Nightshade (*Solanum nigrum*), among many others.
BL3	'Buildings and artificial surfaces' - Within the proposed development, these include roads, bridges, domestic dwellings and working buildings and yards. Most of the buildings and artificial surfaces in the study area are of negligible ecological value. Certain buildings and other structures within the study area, owing to their materials, state of repair, levels of disturbance and connectivity to other habitats, provide potential roost features for bat species and nesting habitat for birds such as Barn Swallow and House Martin.
BL3/GA2(*)	Buildings such as domestic dwellings and their associated landscaped areas or gardens are mapped as a mosaic of 'Buildings and artificial surfaces' (BL3) and 'Amenity grassland (improved)' (GA2). These mosaics also frequently contain small areas of 'Ornamental/non-native shrub' (WS3), 'Horticultural land' (BC2), 'Flower beds and borders' (BC4) and 'Stone walls and other stonework' (BL1). Small, isolated and newer gardens are generally of lower biodiversity value, whereas larger, connected and more mature gardens tend to be of higher value. The gardens of Ballyadam House are marked with an asterisk (*) to indicate their higher biodiversity value due to their size and maturity, particularly mature trees/small woodlands.
ED2	'Spoil and bare ground' - Areas under construction and other areas with unbound surfaces and remaining largely unvegetated due to repeated disturbance. This habitat is subject to disturbance and is not of conservation interest.
ED3	'Recolonising bare ground' - Areas of cleared land recolonising with ruderal species. Areas of bare ground in the study area are re-vegetating with a range of species that are of limited botanical interest.
ER2	'Exposed calcareous rock' – c. 200m south-east (downstream) of where the cycleway crosses the Water Rock stream, there is a large limestone outcrop where the stream disappears below ground, hence the name of the stream and townland.
GA1(*)	'Improved agricultural grassland' – This habitat represents more intensively managed grasslands for grazing of livestock or production of sileage. Within the study area, some of these fields are very species-poor, dominated almost completely by perennial rye-grass (*Lolium perenne*) monocultures which are

Habitat	Description
	regularly reseeded and under high fertiliser application, while others contain a greater diversity of grasses and herbaceous plants such as White Clover (*Trifolium repens*), Creeping Buttercup (*Ranunculus repens*), plantains (*Plantago* spp.) and docks (*Rumex* spp.). Some areas of semi-natural grasslands within the study area are in the process of conversion to GA1 through drainage, reseeding, and fertilising. Most fields of GA1 in the study area are grazes by cattle or horses, but one small field marked as GA1* in Figure 3-5 below is grazed by a single goat and has a very high cover of tall ruderals such as Creeping Thistle (*Cirsium arvense*), Spear Thistle (*C. vulgare*) and Nettle (*Urtica dioica*).
GA2	'Amenity grassland (improved)' - Present throughout the study area in domestic gardens and public green space. It is intensively managed and is of low botanical importance.
GS2(*)	'Dry meadows and grassy verges' - Present in less intensively managed grasslands throughout the study area, particularly in fields that have not been improved in recent years and do not show any indication of recent grazing. Fields which have been abandoned entirely and are not dominant by tall ruderals and early-stage scrub are marked with an asterisk (*). Species-poor variants of this habitat were present in a number of fields within the study area. Dry meadows and grassy verges in the study area do not correspond to any Annex I habitat.
GS4	'Wet grassland' - Relatively species-poor examples occur in the vicinity of the Poulaniska stream in the west of the study area. These fields have been subject to recent attempts at improvement through the clearance of scrub and trees and the enlargement of drainage ditches. As such, they are of limited biodiversity value and in places are transitioning to 'Improved agricultural grassland' (GA1). Wet grassland, as recorded in the study area, does not correspond to Annex I habitat. Frogspawn was noted in a waterlogged depression in one area of this habitat just north of the railway line during surveys for the Carrigtwohill URDF Infrastructure Project.
WD1	'(Mixed) broadleaved woodland' - The only area of woodland within the footprint of the proposed development is a corner of Ash (*Fraxinus excelsior*) – Sycamore (*Acer pseudoplatanus*) woodland at the southern end of the shared-use section on Ballyrichard More Road. Woodlands present within the study area are all very small and contain a mix of both native and introduced tree species. Invasion by Cherry Laurel (*Prunus laurocerasus*) and other invasive alien species negatively impacts on most of these woodlands. While not being of high biodiversity value, they provide suitable habitat for fauna such as bats, birds and mammals.
WS1	'Scrub' – Present in small patches throughout the study area where it has been allowed to develop through the cessation of grazing or other disturbance, e.g., in the corners of fields or in association with recolonising bare ground. It provides cover and forage for fauna and avifauna and if left undisturbed can succeed to woodland.
WS4/WN6	Densely planted stands of willow along the northern side of the railway line in the eastern part of the study area were likely planted to assist in drying out the adjoining lands. Some of these areas have been left to mature and are beginning to develop into a more natural 'Wet willow-alder-ash woodland' (WN6).
WS5	'Recently-felled woodland' - Much of the WS4/WN6 north of the railway line in Poulaniska has recently been cleared/felled and, as such, is mapped as WS5. Many of the 'Hedgerows' (WL1) and 'Treelines' (WL2) in Poulaniska have also been recently cleared/felled. As there is no Fossitt (2000) habitat class for recently cleared hedgerows/treelines, these are also mapped as WS5.
*RC	'Railway corridor' - This is not a habitat type as per the Fossitt (2000) classification and has been created for ease of mapping habitats for the current project. The character and extents of the various constituent habitats of this mosaic vary along its length. However, in the study area, a cross-section from railway centreline to edge may be generalised as follows: rails and concrete sleepers represent 'Buildings and artificial surfaces' (BL3); railway ballast of crushed stone (generally limestone) represents 'Spoil and bare ground' (ED2); moving towards the verges, there may be a very narrow transitional zone where vegetation colonising undisturbed ballast may represent 'Dry calcareous and neutral grassland' (GS1); behind this there may be a band of 'Dry meadows and grassy verges' (GS2) or other grassland type (depending on the soil type); and, finally, there is unusually a 2-5m wide strip of 'Scrub' (WS1), dominated by Gorse but with species such as Bramble and Elder also major components. Given the continuity of these habitats along the railway corridor, they provide important ecological connectivity in the landscape for many species.
Linear habitats	
BL1	'Stone walls and other stonework' - A number of roads in the study area are lined by stone walls and the complex of buildings at Ballyadam House are also good examples of this habitat. These stone walls can provide habitat for a range of calcicolous flora, as well as refugia for fauna, particularly invertebrates. Species identified on stone walls in the study area include Ivy (*Hedera hibernica*), spleenworts (*Asplenium* spp.), polypodies (*Polypodium* spp.), Ivy-leaved Toadflax (*Cymbalaria muralis*), Shining Crane's-bill (*Geranium lucidum*) and Foxglove (*Digitalis purpurea*).

Habitat	Description
FW1(.c) and FW4(.c)	'Eroding/upland rivers' (FW1) represents flowing waters where erosion is the dominant process. This class include natural watercourses, including those which have been modified. Entirely artificial watercourses excavated or modified for drainage purposes are classed as 'Drainage ditches' (FW4). Where watercourses have been crosses by culverts or low bridges in the study area, these have been mapped as "FW1.c" or "FW4.c". The proposed development crosses the Poulaniska, and the Water Rock streams. While small in scale and generally highly modified, they provide important connectivity in the landscape, particularly where they occur in association with hedgerows and other linear habitats, where they provide and enhance foraging and commuting lines for bats and other fauna. As the watercourses in the study area are isolated from larger waterbodies (they both enter groundwater systems a short distance downstream), they are considered very unlikely to support fish communities.
WL1 and WL2	The agricultural fields in the study area are enclosed by a network of 'Hedgerows' (WL1) and 'Treelines' (WL2). These comprise native species including Ash (*Fraxinus excelsior*), Oak (*Quercus* spp.), Elm (*Ulmus* spp.), Hawthorn (*Crataegus monogyna*) and occasional Elder (*Sambucus nigra*) and Willow (*Salix* spp.). These habitats have higher intrinsic ecological value, providing connectivity in the landscape and potential foraging and shelter for avifauna and commuting and foraging areas for bats. Some individual trees also provide roosting opportunities for bats.

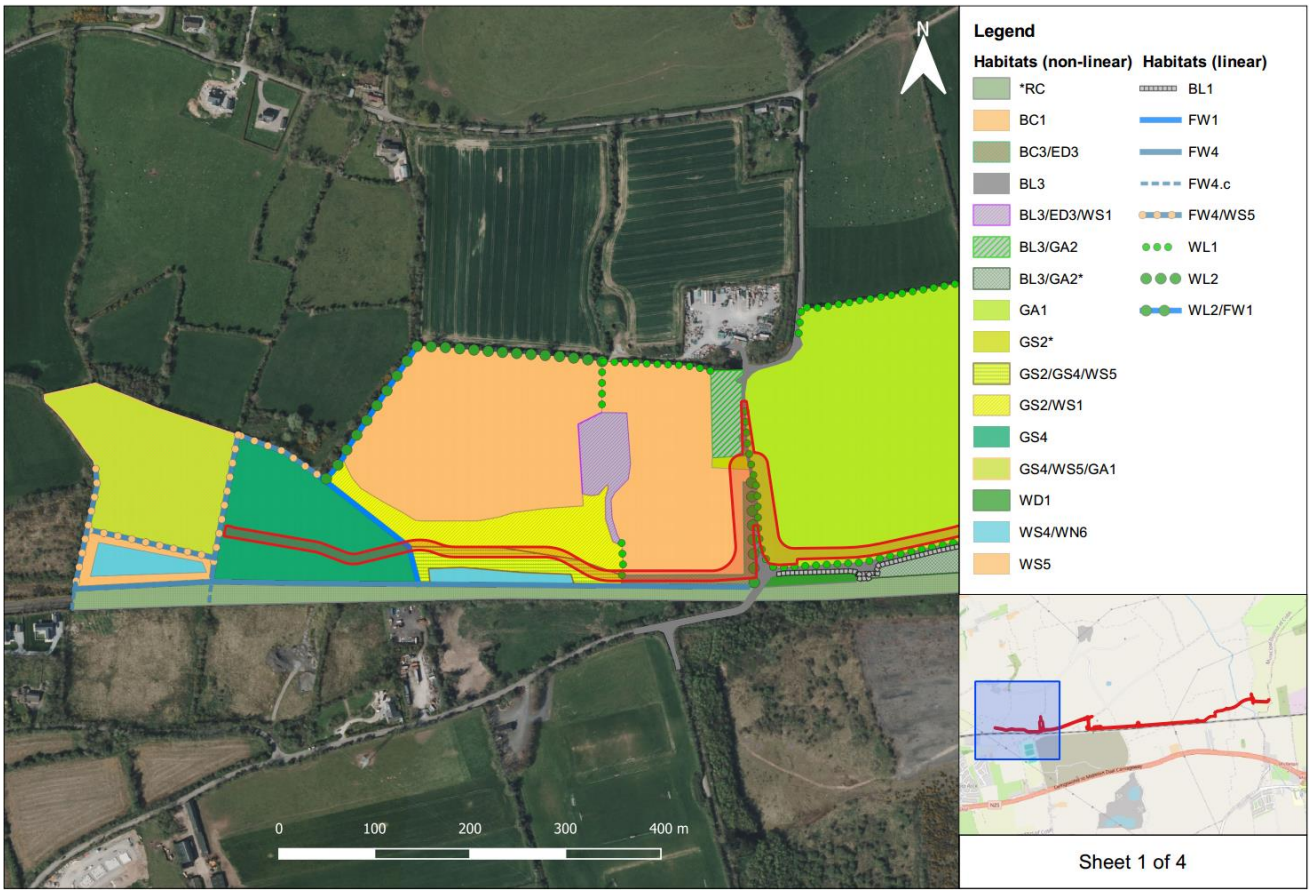

Figure 4-1 - Fossitt (2000) habitats in the study area (first quarter west to east).

Figure 4-2 - Fossitt (2000) habitats in the study area (second quarter west to east).

Figure 4-3 - Fossitt (2000) habitats in the study area (third quarter west to east).

Figure 4-4 - Fossitt (2000) habitats in the study area (fourth quarter west to east).

None of the habitats mapped during the field surveys were deemed to represent examples of Annex I habitats. Strictly, some of the watercourses in the study area, particularly the Water Rock stream and, to a lesser degree, the Poulaniska stream, may be defined as being examples of the Annex I habitat 'Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation' (3260). However, almost all flowing waters in Ireland fall within the very broad interpretation of this habitat type. Given that the watercourses in question poor examples of this common and widespread habitat and their lack of connectivity to better examples, they are not treated as this Annex I type.

4.2.2. Flora

None of the listed flora species in Section 4.1.2. were recorded during the field surveys. Of species recorded during 2023 field surveys, none are protected under the Flora (Protected) Order, 2022 or listed as greater than Least Concern in the relevant Irish Red Lists.

4.2.3. Fauna

4.2.3.1. Non-volant mammals

During the field surveys, evidence of Red Fox (*Vulpes vulpes*) was found throughout the study area. This species is listed as Least Concern and is not protected under the Habitats Directive or the Wildlife Act. Evidence of Badger (*Meles meles*) within the study area was limited to feeding signs (snuffle holes) at the western end of Ballyrichard More Road. Badger prints were also noted just north of the railway corridor at the far western end of the proposed development during surveys for the Carrigtwohill URDF Infrastructure Project in February 2023. No confirmed or possible badger setts were noted during any of these surveys. While badgers are likely to forage and commute within the footprint of the proposed development, there is not considered to be any breeding or resting places at present.

No evidence of Otter (*Lutra lutra*) was observed during the field surveys. Given the small size and isolation of the watercourses in the vicinity of the proposed development, they are considered to be capable of supporting this species.

While no evidence of Hedgehog, Irish Hare, Pine Marten, Irish Stoat, Red Squirrel, or Pygmy Shrew were noted during the surveys, these species are considered likely to be present in the study area as they are common and widespread in Ireland and are also highly mobile.

4.2.3.2. Bats

A targeted bat survey undertaken by Greenleaf Ecology found that 7 no. out of 10 no. bat species in Ireland have been recorded within 4km of the proposed development and that overall, the study area is considered to be of 'Moderate' suitability for foraging and commuting bats due to the presence of connectivity to other suitable habitats in the wider landscape. The Greenleaf Ecology (2023) report is presented in full in Appendix A to the EcIA submitted with this Appropriate Assessment Screening.

4.2.3.3. Birds

Bird species incidentally observed during the field surveys, along with their BoCCI status, are listed in Table 4-4 below. None of these species are listed on Annex I to the Birds Directive. All wild birds are protected under the Wildlife Act.

Table 4-4 - Bird species observed during the field surveys. BoCCI = status as per Gilbert *et al*. (2021).

Common Name	Scientific Name	Status
Grey Heron	*Ardea cinerea*	BoCCI-Green
Buzzard	*Buteo buteo*	BoCCI-Green
Goldfinch	*Carduelis carduelis*	BoCCI-Green
Woodpigeon	*Columba palumbus*	BoCCI-Green
Robin	*Erithacus rubecula*	BoCCI-Green
Yellowhammer	*Emberiza citrinella*	BoCCI-Red
Chaffinch	*Fringilla coelebs*	BoCCI-Green
Swallow	*Hirundo rustica*	BoCCI-Amber
Magpie	*Pica pica*	BoCCI-Green
Bullfinch	*Pyrrhula pyrrhula*	BoCCI-Green
Starling	*Sturnus vulgaris*	BoCCI-Amber
Blackbird	*Turdus merula*	BoCCI-Green

4.2.3.4. Reptiles & Amphibians

While no evidence of Common Frog or other amphibians or reptiles was noted during the field surveys carried out to inform this AA Screening, during the surveys for the Carrigtwohill URDF Infrastructure Project in February 2023, frogspawn was observed in large puddles in wet grassland just north of the railway corridor in Poulaniska, at the western end of the proposed cycleway. Given the relative lack of ponds and other suitable wetlands across the study area, it is considered that the drainage ditches and wet grasslands west of the Ballyadam Road are the only areas of importance for frogs in the study area.

4.2.3.5. Invasive Alien Plant Species

Non-native garden escapes observed during the surveys included Giant Bugloss (*Echium pininana*), Variegated Yellow Archangel (*Lamiastrum galeobdolon* subsp. *argentatum*), Greater Periwinkle (*Vinca major*) and Silver Ragwort (*Jacobaea maritima*), and shrubs such as dogwoods (*Cornus* spp.) and a cotoneaster (*Cotoneaster* sp.). Other non-native trees present included Bay Laurel (*Laurus nobilis*), Beech (*Fagus sylvatica*), Horse Chestnut (*Aesculus hippocastanum*), Spanish Chestnut (*Castanea sativa*) and a variety of maples (*Acer* spp.) and their cultivars, as well as non-native conifers such as cypresses (Cupressaceae). None of these are assessed in O'Flynn et al. (2014) or restricted under the Habitats Regulations or the EU IAS Regulation. Table 4-5 presents IAPS identified during the field surveys, their impact ratings and status.

Table 4-5 - IAPS identified during the field surveys, their impact ratings and status.

Species	O'Flynn *et al*. (2014)	Third Schedule	EU IAS Regulation
Himalayan Balsam (*Impatiens glandulifera*)	**High-impact**	**Yes**	**Yes**
Japanese Knotweed (*Fallopia japonica*)	**High-impact**	**Yes**	No
Cherry Laurel (*Prunus laurocerasus*)	**High-impact**	No	No
Three-cornered Leek (*Allium triquetrum*)	Medium-impact	**Yes**	No
Sycamore (*Acer pseudoplatanus*)	Medium-impact	No	No
Traveller's-joy (*Clematis vitalba*)	Medium-impact	No	No
Winter Heliotrope (*Petasites fragrans*)	n/a	No	No

5. Natura 2000 Sites

5.1. Zone of Influence

The “Zone of Influence” of a plan or project is the area which may experience ecological effects as a result of its implementation, including any ancillary activities. The various impacts of a plan or project will each have their own characteristics, e.g., nature, extent, magnitude, duration etc. Accordingly, the area subject to each impact (“zone of impact”) will vary depending on characteristics of the impact and the presence of pathways for its propagation. Ecological features within or connected to one or more zones of impact could, depending on their sensitivities, be affected by the plan or project under consideration. The area containing such features may be regarded as the Zone of Influence. As such, in establishing the Zone of Influence for a plan or project, regard must be had to the characteristics of its potential impacts, potential pathways for impacts and the sensitivities of ecological features in the receiving environment.

In its guidance on selecting which Natura 2000 sites to include in the AA Screening, *Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities* (DEHLG, 2010a) recommends inclusion of sites in the following three categories: -

- Any Natura 2000 sites within or adjacent to the plan or project area,
- Any Natura 2000 sites within the Zone of Influence of the plan or project (generally within 15km for plans, to be established on a case-by-case basis for projects, having regard to the nature, scale and location of the project, the sensitivities of the ecological receptors and the potential for in-combination effects), and
- Following the precautionary principle, any other Natura 2000 sites for which the possibility of significant effects cannot be excluded, e.g., for a project with hydrological impacts, it may be necessary to check the full extent of the catchment for Natura 2000 sites with water-dependent qualifying interests.

In addition, *Assessment of plans and projects in relation to Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC* (EC, 2021) recommends consideration of Natura 2000 sites hosting fauna which could move to the plan or project area or its zone(s) of impact, and the potential for the plan or project to sever ecological connectivity within or between Natura 2000 sites. *Appropriate Assessment Screening for Development Management* (OPR, 2021) emphasises the importance of employing the source-pathway-receptor model (rather than arbitrary distances such as 15km) when selecting Natura 2000 sites for inclusion in the AA Screening.

Based on the nature, scale and location of the proposed development and the baseline conditions in the receiving natural environment, the zones of impact of the proposed development were defined as: -

- For habitat loss and fragmentation, all areas within the proposed development boundary, including any areas temporarily required during construction,
- For disturbance to birds and other fauna, all areas within a precautionary buffer of 500m from the proposed development,
- For water quality impacts, all surface waters which intersect the proposed development or are located within 100m thereof, as well as connected upstream and downstream stretches, and
- For the introduction or spread of invasive alien species, the proposed development site, and adjoining areas, as well as likely haul routes to/from the construction site.

The Zone of Influence was defined as the above zones of impact as well as other areas with potential ecological connectivity to them, i.e., woodlands and other semi-natural habitats connected to the proposed development by proximity or linear landscape features such as hedgerows or treelines and connected wetlands and waterbodies.

Publicly available spatial data for river, transitional and coastal waterbodies (*EPA Maps*) was used in conjunction with aerial imagery to identify pathways and zones of impact for disturbance and water quality impacts from the proposed development. These were then mapped in relation to Natura 2000 sites (see Figure 5-1 below). In addition, the Zone of Influence was examined to identify any other Natura 2000 sites with potential ecological connections to these zones of impact.

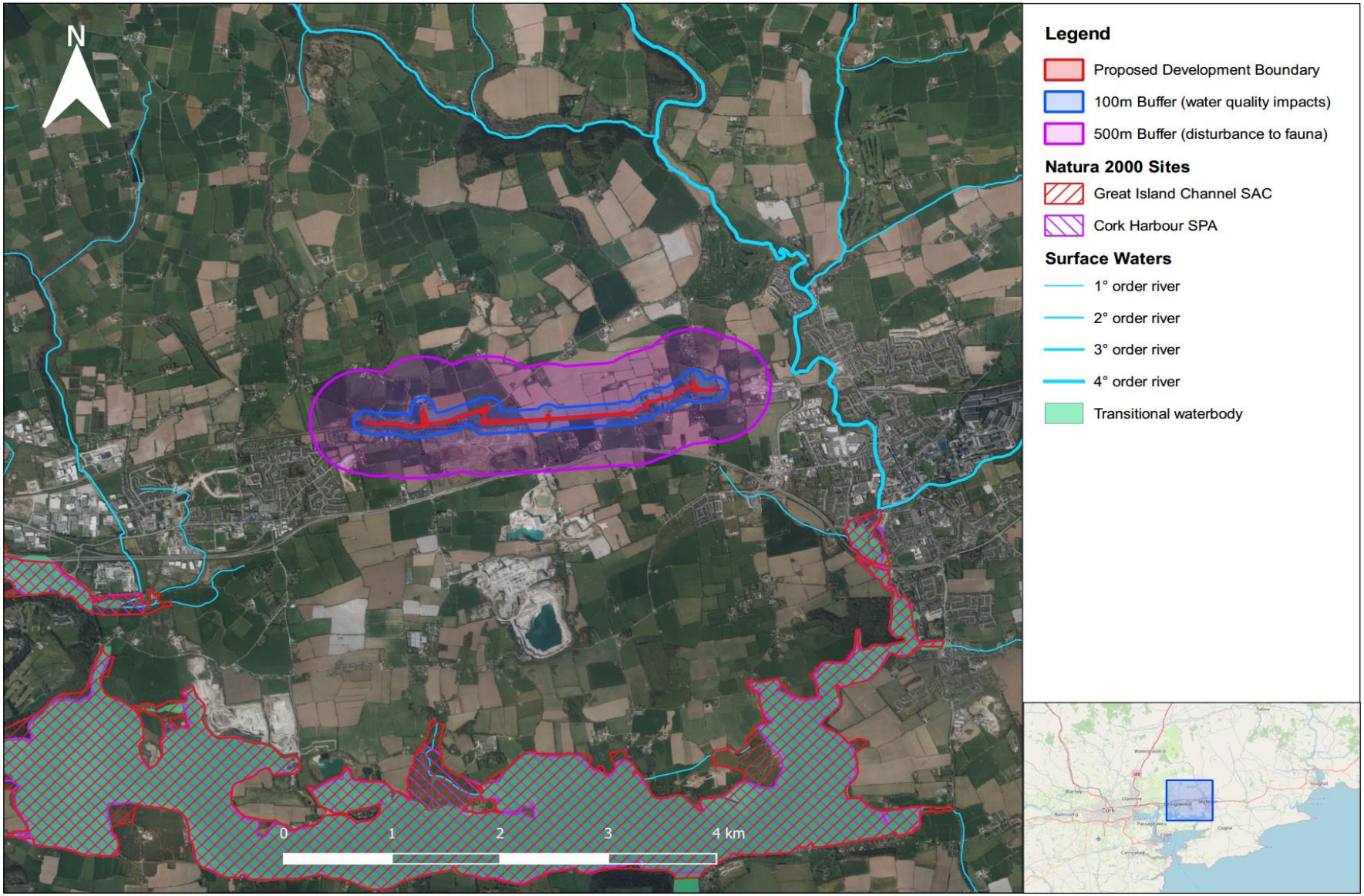

Figure 5-1 - Zones of impact from the proposed development in relation to the boundaries of Natura 2000 sites.

5.2. Identification of Sites

Habitat loss and fragmentation

There are no Natura 2000 sites within, intersecting or adjoining the proposed development boundary. Therefore, there will be no direct effects on any such sites arising from habitat loss or fragmentation associated with the proposed development.

The nearest sites are the Great Island Channel SAC (site code: 002170) and the Cork Harbour SPA (site code: 004030), which are both located c. 1.8km southeast (over land) from the proposed development at their closest point. The Great Island Channel SAC is selected for 2 no. habitat types and no species. As such, there are no species of qualifying interest in this SAC which depend on habitats closer to the proposed development. The qualifying interest habitats 'Mudflats and sandflats not covered by seawater at low tide' (1140) and 'Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)' (1330) do not occur within or adjacent to the footprint of the proposed development. The Cork Harbour SPA is selected for 23 no. waterbird species, as well as wetland habitat within the SPA. Therefore, there is no potential for habitat loss or fragmentation affecting the SPA as a result of the proposed development.

Disturbance to birds and other fauna

There are no Natura 2000 sites within 500m of the proposed development. As noted, the Great Island Channel SAC and Cork Harbour SPA are both located c. 1.8km southeast from the proposed development at their closest point (over land) and, while the SAC is not selected for any species, the SPA is selected for a number of bird species which are highly mobile and so could potentially use habitats in the vicinity of the proposed development. However, given the nature of the habitats in the zone of impact for disturbance and the availability of more suitable habitats closer to the SPA, they are not considered to be of importance for these birds. Therefore, any significant ex-situ impacts can be ruled out at this stage.

There is not considered to be any potential for direct, indirect or ex-situ impacts of artificial lighting from the proposed development to the Great Island Channel SAC and Cork Harbour SPA.

Water quality impacts

Given that the Poulaniska stream and Water Rock stream ultimately discharge into the Great Island Channel SAC and Cork Harbour SPA via karst systems, there is some degree of hydrological connectivity between the proposed development and identified European sites. At a minimum (given that the full extent of the underground karst system to be unknown and in this instance, assumed as a direct line) the proposed development lies c. 2.3km upstream from the Great Island Channel SAC and Cork Harbour SPA.

Given the magnitude, extent and duration of potential water quality impacts associated with the proposed development, and the length and complexity of the hydrological pathways concerned, there is not considered to be any risk of water quality impacts affecting the features of interest encompassed by the Great Island Channel SAC or Cork Harbour SPA.

Invasive alien species

Site walkover surveys have informed the locations and extent of invasive alien plant species within the proposed development area. Identified IAPS which are legally restricted do not occur along any watercourses which may provide a hydrological pathway to the SAC or SPA. Therefore, the Great Island Channel SAC and Cork Harbour SPA are considered to be well beyond the likely extent of any inadvertent spread of IAPS associated with the proposed development.

Indirect effects

There are no additional Natura 2000 sites present within the wider Zone of Influence. Given the lack of ecological connectivity between the zones of impact of the proposed development and Natura 2000 sites other than the Great Island Channel SAC and Cork Harbour SPA, the possibility of likely significant effects on other such sites can be ruled out at this stage.

5.3. Site Descriptions

The descriptions of Natura 2000 sites presented in this section are based on the Site Synopsis, Conservation Objectives and Natura 2000 Standard Data Form documents for the sites concerned, augmented by information from the supporting documents available on the site-specific pages of the NPWS website.

Annex I habitat types marked with an asterisk (*) are “priority habitat types”, i.e., natural habitat types in danger of disappearing and for the conservation of which the EU has a particular responsibility given the proportion of their natural ranges falling within the European territory of Member States.

5.3.1. Great Island Channel SAC

Overview

The following description is taken from the Site Synopsis (NPWS, 2013) and Conservation Objectives Supporting Document (NPWS, 2014b) for Great Island Channel SAC.

> ‘*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 Great Island Channel SAC is of ecological importance for its examples of intertidal mud and sand flats and Atlantic salt meadows of the estuarine type. Both habitats are fairly extensive in area and of moderate to good quality. The site has high ornithological importance, regularly supporting c. 50% of the wintering waterfowl of Cork Harbour (NPWS, 2013; 2014b). Significant proportions of the internationally important populations of Black-tailed Godwit and Redshank, which winter in Cork Harbour, utilise the site and it supports nationally important populations of a further 12 species, including Golden Plover and Bar-tailed Godwit, both listed on Annex I to the Birds Directive.

Qualifying Interests and Conservation Objectives

The Great Island Channel SAC was selected for the following qualifying interests: -

- Mudflats and sandflats not covered by seawater at low tide (1140)
- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) (1330)

The Annex I habitat ‘Estuaries’ (1130) is also present within the site (NPWS, 2019d) but is not listed as a qualifying interest. NPWS (2014b) states that the swards of *Spartina* sp. within the site are not considered to qualify as the Annex I habitat ‘*Spartina* swards (*Spartinion maritimae*)’ (1320).

The conservation objectives of the Great Island Channel SAC are as follows:

- *To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in Great Island Channel SAC*
- *To restore the favourable conservation condition of Atlantic salt meadows (Glauco-Puccinellietalia maritimae) in Great Island Channel SAC*

The Conservation Objectives document for the site (NPWS, 2014a) also states the following: “*Please note that this SAC overlaps with Cork Harbour SPA (004030). […] The conservation objectives for this site should be used in conjunction with those for the overlapping site as appropriate.*”

Threats, Pressures and Activities

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

Table 5-1 below lists the threats, pressures, and activities with negative impacts on the site, as per its Natura 2000 Standard Data Form (NPWS, 2019d).

Table 5-1 - Threats, pressures, and activities with negative impacts on the Great Island Channel SAC.

Rank	Threat, pressure or activity (code)	Threat, pressure or activity (description)	Inside, outside or both
High	F01	Marine and Freshwater Aquaculture	inside
High	D01.02	roads, motorways	inside
Medium	I01	invasive non-native species	inside
Medium	A04	grazing	inside
High	J02.01.02	reclamation of land from sea, estuary or marsh	inside
Medium	A08	Fertilisation	outside
High	E01	Urbanised areas, human habitation	outside
Medium	K02.03	eutrophication (natural)	inside

NPWS (2019d) and Eionet (2022).

5.3.2. Cork Harbour SPA

Overview

The following description is taken from the Site Synopsis (NPWS, 2015) and Conservation Objectives Supporting Document (NPWS, 2014c) for Cork Harbour SPA.

> '*Cork Harbour is a large, sheltered bay system, with several river estuaries, principally those of the Rivers Lee, Douglas, Owenboy and Owenacurra. The site comprises most of the main intertidal areas of Cork Harbour, including all of the Great Island 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. Salt marshes are scattered through the site, and these provide high tide roosts for the birds. Otherwise, birds roost on stony shorelines and in some areas fields adjacent to the shore. Some shallow bay water is included in the site. Cork Harbour is adjacent to a major urban centre and a major industrial centre.

Cork Harbour is an internationally important wetland site, regularly supporting in excess of 20,000 wintering waterfowl, for which it is amongst the top five sites in the country. It supports an internationally important population of Redshank (*Tringa totanus*). A further 15 species have populations of national importance, with particularly notable numbers of Shelduck (*Tadorna tadorna*) (9.6% of national total), Shoveler (*Anas clypeata*) (4.5% of total), Pintail (*Anas acuta*) (4.2% of total) and Cormorant (*Phalacrocorax carbo*) (4.1% of total) occurring. It has regionally important populations of Golden Plover (*Pluvialis apricaria*) and Bar-tailed Godwit (*Limosa lapponica*). Passage waders are regular, including Ruff (*Philomachus pugnax*) and Spotted Redshank (*Tringa erythropus*). It is an important site for gulls in winter and autumn, especially Common Gull (*Larus canus*) and Lesser Black-backed Gull (L*. fuscus*). The SPA provides both feeding and roosting areas for the waterfowl species. The quality of most of the estuarine habitats is good. The wintering birds have been well-monitored since the 1970s. The site has a breeding colony of Common Tern (*Sterna hirundo*) which is of national importance.'

Qualifying Interests and Conservation Objectives

The Cork Harbour SPA was selected for the following qualifying interests: -

- 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 alpina*) (A149)
- Black-tailed Godwit (*Limosa limosa*) (A156)
- Bar-tailed Godwit (*Limosa lapponica*) (A157)
- Curlew (*Numenius arquata*) (A160)
- Redshank (*Tringa totanus*) (A162)
- Black-headed Gull (*Chroicocephalus ridibundus*) (A179)
- Common Gull (*Larus canus*) (A182)
- Lesser Black-backed Gull (*Larus fuscus*) (A183)
- Common Tern (*Sterna hirundo*) (A193)
- Wetlands (A999)

All of the qualifying interests listed above are assigned a conservation objective to “maintain” their favourable conservation status in the Cork Harbour SPA.

The Conservation Objectives document for the site (NPWS, 2014d) also states the following: “*Please note that this SPA overlaps with Great Island Channel SAC (001058). […] The conservation objectives for this site should be used in conjunction with those for the overlapping site as appropriate.*”

Threats, Pressures and Activities

Table 5-2 below lists the threats, pressures, and activities with negative impacts on the Cork Harbour SPA, as per its Natura 2000 Standard Data Form (NPWS, 2021).

Table 5-2 - Threats, pressures, and activities with negative impacts on the Cork Harbour SPA.

Rank	Threat, pressure or activity (code)	Threat, pressure or activity (description)	Inside, outside or both
High	D03.01	port areas	outside
High	E02	Industrial or commercial areas	outside
Low	E01.03	dispersed habitation	outside
Medium	G01.02	walking, horse riding and non-motorised vehicles	inside
High	E01	Urbanised areas, human habitation	outside
Medium	F02.03	Leisure fishing	inside
High	D01.02	roads, motorways	outside
High	F01	Marine and Freshwater Aquaculture	inside
Medium	G01.01	nautical sports	inside
Medium	D03.02	Shipping lanes	inside
Medium	A08	Fertilisation	outside

NPWS (2021) and Eionet (2022).

6. Likely Significant Effects

6.1. Identification of Likely Significant Effects

The identification of likely effects in this section follows the "source-pathway-receptor" model. According to this model, for an effect to exist, all three of the following criteria must be met: -

- Some aspect of the plan or project must act as a source of an impact,
- There must be a pathway capable of conveying the impact to a receptor, and
- The receptor must be sensitive to the impact.

Types of impacts likely to arise from the proposed development and their sources are described in Section 5, potential pathways for those impacts are described and illustrated in Sections 5.1 and 5.2, and receptors are described in Section 5.3. The following subsections detail the specific effects on each receptor and evaluate their significance in view of the relevant conservation objectives.

6.1.1. Great Island Channel SAC

Likely significant effects on the Great Island Channel SAC are identified, in view of the conservation objectives of the site, in Table 6-1 below.

Table 6-1 - Identification of impacts and evaluation of effects on the Great Island Channel SAC (LSE = likely significant effect).

Qualifying interest	Identification of likely significant effects	LSE
Mudflats and sandflats not covered by seawater at low tide	This habitat occurs in the intertidal areas of the SAC, at least c. 2.3km downstream of the proposed development via the Water Rock stream which ultimately discharges into the Owenacurra Estuary. This habitat depends on water quality to maintain the 'Mixed sediment to sandy mud with polychaetes and oligochaetes community complex' in a natural condition and there is hydrological connectivity between the proposed development and this habitat. However, given the magnitude, extent and duration of potential water quality impacts associated with the proposed development, and the length and complexity of the hydrological pathways concerned, there is not considered to be any risk of water quality impacts on this habitat. Therefore, likely significant effects on the conservation objectives for this qualifying interests can be ruled out at this stage.	No
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)	These habitats occur in the saltmarshes on the edge of the intertidal mudflats and sandflats. These habitats are subject to periodic inundation (during spring tides), their vegetation structure and composition are sensitive to pollution of the estuarine waters of the SAC. As above, there is hydrological connectivity between the proposed development and this habitat. However, given the magnitude, extent and duration of potential water quality impacts, and the length and complexity of the hydrological pathways concerned, there is not considered to be any risk of water quality impacts on this habitat. Therefore, likely significant effects on the conservation objectives for this qualifying interests can be ruled out at this stage.	No

6.1.2. Cork Harbour SPA

Likely significant effects on the Cork Harbour SPA are identified, in view of the conservation objectives of the site, in Table 6-2 below.

Table 6-2 - Identification of impacts and evaluation of effects on the Cork Harbour SPA (LSE = likely significant effect).

Qualifying interest	Identification of likely significant effects	LSE
• Little Grebe • Great Crested Grebe • Cormorant • Grey Heron • Shelduck • Wigeon • Teal • Pintail • Shoveler • Red-breasted Merganser • Oystercatcher • Golden Plover • Grey Plover • Lapwing • Dunlin • Black-tailed Godwit • Bar-tailed Godwit • Curlew • Redshank • Black-headed Gull • Common Gull • Lesser Black-backed Gull • Common Tern	Given the distance between the proposed development and the Cork Harbour SPA, there will be no direct habitat loss or disturbance which could affect birds in the SPA. In addition, given the magnitude, extent and duration of potential water quality impacts associated with the proposed development, and the length and complexity of the hydrological pathways concerned, there is not considered to be any risk of water quality impacts on foraging habitat for birds in the SPA. Furthermore, the habitats within and adjacent to the footprint of the proposed development are not considered to be of importance to any of the bird species of special conservation interest in the SPA. Agricultural fields through which the cycleway is routed are c. 40% arable (wheat and maize) and horticultural (beans), which are generally unsuitable for feeding birds, except when bare in winter, and c. 60% improved grassland (pasture), which is generally suitable. However, given the fact that the cycleway is routed along the edge of these fields, their distance from the SPA and that the cycleway will be screened by new hedgerows and treelines, there is no risk of significant ex-situ impacts on any birds from the SPA. Therefore, likely significant effects on the conservation objectives for these qualifying interests can be ruled out at this stage.	No
Wetlands	Wetland habitat for waterbirds does not occur within or within the immediate environs of the proposed development. Therefore, there will be no direct impacts through habitat loss. Wetland habitat is sensitive to changes in water quality with regard to foraging for waterbirds. However, given the magnitude, extent and duration of potential water quality impacts associated with the proposed development, and the length and complexity of the hydrological pathways concerned, there is not considered to be any risk of water quality impacts on wetland habitat in Cork Harbour SPA. Therefore, likely significant effects on the conservation objective for this qualifying interest can be ruled out at this stage.	No

6.2. Summary

On the basis of objective information presented in Sections 3, 4, and 5, the evaluation in Section 6.1 has found that there are no impacts, such as water quality impacts and ex-situ disturbance, likely to arise from the proposed development which could give rise to likely significant effects on the Qualifying Interests of Cork Harbour SPA or the Great Island Channel SAC.

7. Potential In-combination Effects

7.1. Requirement for Assessment

The requirement for AA arising out of Article 6(3) of the Habitats Directive covers plans and projects that, "*either individually or in combination with other plans or projects*", are likely to have a significant effect on one or more Natura 2000 sites. This means that AA is required for any plan or project that, in combination with other plans or projects, would have a significant effect on one or more Natura 2000 sites, irrespective of the presence or absence of such effects from that plan or project on its own. Therefore, regardless of the significance of the effects of the plan or project individually, the potential for significant effects in combination with other plans and projects must be considered in all cases.

7.2. Approach and Methodology

The objective of this requirement is to capture significant effects potentially arising from the cumulation or other interaction of non-significant effects from multiple plans and projects. Consequently, the assessment of potential in-combination effects is not a pair-wise assessment, rather, it considers the totality of the effects arising from all plans and projects affecting the Natura 2000 site(s) in question. In identifying the plans and projects to be included in this assessment, it is important to define an appropriate geographical scope and timescale over which potential in-combination effects are to be considered and the sources of information to be consulted, as described below. It is also important to consider the nature of the interactions between effects, which may be additive, antagonistic, synergistic or complex.

7.2.1. Geographical Scope

In defining the geographical scope for identifying potential in-combination effects, it is important to remember that effects are evaluated in view of the conservation objectives of the Natura 2000 site(s) concerned. As such, two or more effects relating to the same conservation objective for a given Natura 2000 site would combine even if their geographical extents did not overlap. For example, the loss of a small area of an Annex I habitat type listed as a qualifying interest of a Natura 2000 site would combine with the loss of an entirely unconnected area of the same habitat type from a remote part of the same site to produce an in-combination effect, the significance of which would need to be evaluated in view of the relevant conservation objective. On that basis, the scope of the assessment of in-combination effects extends to all plans and projects affecting the same conservation objectives as the plan or project under consideration, irrespective of whether those effects are significant or not.

It was established in Section 5 of this report that the proposed development has connectivity to 2 no. Natura 2000 sites, namely the Great Island Channel SAC and Cork Harbour SPA. Thus, the geographical scope of the in-combination assessment covered all areas which influence the conservation condition of the qualifying interests of these sites, which was taken to be the ZoI of the proposed development itself, plus transitional and coastal waterbodies of Cork Harbour and the adjoining lands (including lands adjoining the River Lee in Cork City and the River Owenacurra in Midleton).

7.2.2. Timescale

Given the nature and scale of the proposed development, and its integration with other future developments, including those which form part of the Carrigtwohill Urban Expansion Area (UEA) and the Midleton to Dunkettle Inter-urban Cycle Route (IU-1), it was considered appropriate to include all existing plans, projects and ongoing activities, projects under construction, approved or awaiting planning decisions, activities awaiting licensing, and any additional future plans or projects for which there is sufficient information available at this stage to allow for meaningful consideration of the potential in-combination effects. This includes particularly other projects relating to the Carrigtwohill UEA.

7.2.3. Sources of Information

The following sources of information were consulted to gather information on other plans and projects: -

- Cork County Development Plan 2022-2028.

- Cork City Development Plan 2022-2028.
- Cork County Council Planning Viewer <https://corkcocoeur.maps.arcgis.com/apps/webappviewer/index.html?id=254568bc8931492eb72ab5446c411cb9> [accessed 24/10/2023].
- Cork City Council Planning < https://corkcity.maps.arcgis.com/apps/webappviewer/index.html?id=e4af482c8da547de9f1689eba346a1ed> [accessed 24/10/2023].
- EIA Portal <https://housinggovie.maps.arcgis.com/apps/webappviewer/index.html?id=d7d5a3d48f104ecbb206e7e5f84b71f1> [accessed 24/10/2023].
- EPA Maps <https://gis.epa.ie/EPAMaps> [accessed 24/10/2023].
- Ireland's Marine Atlas <https://atlas.marine.ie/> [accessed 24/10/2023].

Plans and projects in the following categories were considered to be particularly relevant to this assessment: -

- Plans and projects contributing to the known threats, pressures, and activities with negative effects on the Great Island Channel SAC and Cork Harbour SPA, as described in the Site Synopses (NPWS, 2013, 2015) and catalogued in the Natura 2000 Standard Data Forms (NPWS, 2019d, 2021),
- Other plans and projects whose construction or operation negatively affect water quality in Cork Harbour, particularly the Great Island Channel and the Slatty Water,
- Other plans and projects causing habitat loss/fragmentation (including outside the Cork Harbour SPA) for waterbirds, particularly in Carrigtwohill and the surrounding agricultural areas, and
- Carrigtwohill UEA projects and other projects connecting to the wastewater infrastructure which forms part of the proposed development.

7.3. Assessment

Plans

The current Cork City Development Plan and Cork County Development Plan set out the policies and objectives of Cork City Council and Cork County Council, respectively, with regard to the proper planning and sustainable development within their respective functional areas. Both plans cover the period from 2022 to 2028.

Both the Cork City Development Plan and the Cork County Development Plan were subject to AA, including the preparation of Natura Impacts Reports (NIRs). These NIRs assessed at a strategic level, the implications of the plans for Natura 2000 sites, including the Great Island Channel SAC and the Cork Harbour SPA. Where potential adverse effects were identified, the plans were amended to mitigate those effects. Following these amendments, the adopted plans now contain specific text in relation to the protection of these and other Natura 2000 sites. This includes restrictions on development within the vicinity of these sites, requirement for assessment under Article 6 of the Habitats Directive for development likely to have a significant effect on these sites, use of sustainable urban drainage systems (SUDS), and commitments to develop green infrastructure to support Natura 2000 sites and biodiversity generally, in line with Article 10 of the Habitats Directive and Article 3 of the Birds Directive.

The policies and objectives in these local authority development plans contribute to mitigating the negative effects of development on the Great Island Channel SAC, Cork Harbour SPA and other Natura 2000 sites and provide for the enhanced resilience of these sites through the development of green infrastructure/ecological networks. Therefore, there will be no adverse effects from the proposed works in combination with these development plans and these plans will also mitigate any in-combination effects arising from other projects.

Projects

Carrigtwohill and Midleton Infrastructure Projects

There is a number of significant and inter-connected infrastructure projects currently at different stages of design, planning and construction which relate to planned regeneration and future development of these towns and the surrounding areas. These projects include: -

- Carrigtwohill UEA Infrastructure,
- Carrigtwohill URDF Initiative – Public Realm Infrastructure Bundle,
- Station Road Schools Campus in Carrigtwohill,
- Midleton to Dunkettle Inter-urban Cycle Route, which includes the
    - Bury's Bridge/Dunkettle Cycleway, and the
    - Carrigtwohill to Midleton Inter-Urban Cycle Route Phase 1,
- Water Rock LIHAF Initiative – UEA Infrastructure,
- Ballinacurra to Midleton and Water Rock Pedestrian and Cycle Scheme,
- Midleton to Youghal Cycle Route, and
- Glounthaune to Midleton Twin Track Project.

Each of these projects is described in more detail in the Part 8 report which accompanies the application.

Other Large-scale Projects

A search of the *EIA Portal*, focussing on areas within c. 1km of the Great Island Channel SAC and Cork Harbour SPA and connected waterbodies, identified 36 no. projects which required and provided Environmental Impact Assessment (EIA). These included applications relating to quarries, new large-scale residential and mixed-use developments, railway improvement, electricity transmission, chemical and pharmaceutical industry, wastewater infrastructure, bridges, and educational facilities. These projects are summarised in Table 7-1 below.

Table 7-1 - Projects identified through the EIA Portal.

Competent Authority	Application No.	Applicant Name	Location	Description
Cork County Council	17/5659	Janssen Sciences Ireland UC	Barnahely, Ringaskiddy, Co. Cork	An extension to the existing biomedicines manufacturing facility (proposed gross floor area c. 19,116m^2).
An Bord Pleanála	PL04.248154	GE Healthcare Life Sciences BioPark	Barnahely, Raheens East, Ringaskiddy, Co. Cork	BioPark and all ancillary site development works including landscaping.
Cork County Council	17/7428	John Garde	Courtstown Industrial Estate, Courtstown, Little Island, Co. Cork	Construct a building (6625m^2) containing a waste transfer and recycling facility. The proposed development also includes the construction of a separate two storey administration block (178m^2).
EPA	P0778-02	Janssen Sciences Ireland UC	Barnahely, Ringaskiddy, County Cork	5.16 The production of pharmaceutical products including intermediates.
Cork County Council	18/7200	Country Clean Recycling	Courtstown Industrial Estate, Courtstown, Little Island, Co. Cork	Construct a building containing a waste transfer and recycling facility along with a separate Administration Block, ESB Sub-Station, weighbridges, underground tanks,

Competent Authority	Application No.	Applicant Name	Location	Description
		Unlimited Company		service yard, new boundary treatments and all associated drainage and site works.
EPA	n/a	Indaver Ireland Limited	Ringaskiddy, County Cork (National Grid Ref. E179055, N064279)	Waste to Energy Facility (waste incinerator with energy recovery) for the treatment of residual household, commercial and industrial waste which includes up to 24,000 tonnes of suitable hazardous waste with an annual capacity of 240,000 tonnes per annum.
Cork City Council	n/a	Tower Development Properties Ltd	The Custom House site at North Custom House Quay and South Custom House Quay, Custom House Street, Cork City	Refurbishment of the existing buildings on site including the Custom House and Bonded Warehouses, construction of a 34-storey tower c. 140m over the Revenue Building, a distillery, remedial works to quay walls, and the provision of a new public realm.
An Bord Pleanála	n/a	Progressive Commercial Construction Ltd	Site of Carey Tool Hire and the former Sextant bar, Albert Quay, Cork City	A Strategic Housing Development of 201no. Build To Rent apartments in a building that ranges in height from 8 to 11 to 24 storeys over ground floor, ancillary resident & communal facilities; cafe; private rented office; public bar/restaurant; basement.
Cork County Council	19/6783	Belvelly Marino Development Company DAC	Belvelly Port Facility, Marino Point, townlands of Marino, Belvelly and Oldcourt, Cobh, Co. Cork	Demolition, site infrastructure improvements, and utility upgrade works to stabilise the existing site and to provide capacity for future industrial development proposals.
Cork County Council	19/6964	Architectural and Metal Systems Limited	Wallingstown, Little Island, Co. Cork, T45 VP40	Construction of a new single-storey extension for the surface treatment (anodising) of aluminium sections, underground services, and associated site works.
Minister for Public Expenditure and Reform	DPE63-18-2018	Commissioners for Public Works	Blackpool, Cork	Flood Relief Scheme for Blackpool, Cork involving the construction of direct flood defences and conveyance improvement measures along a stretch of the River Bride and its tributaries in Blackpool, Cork.
Minister for Public Expenditure and Reform	DPE63-9-2018	Commissioners for Public Works	Glanmire/Sallybrook, Cork	Flood Relief Scheme for Glanmire/Sallybrook, Cork involving the construction of direct flood defences and conveyance improvement measures along the Glashaboy River and its tributaries.
Cork County Council	20/5627	Portfolio Concentrate Solutions UC ("PepsiCo Ireland")	Ballytrasna, Little Island, Co. Cork	Extension to the existing Production Building, expansion of the Site Utility Services and provision of a new Wastewater Treatment Plant.
An Bord Pleanála	n/a	Marina Quarter Limited	Former Ford Distribution Site, Centre Park Road, Cork	Permission for a Strategic Housing Development at the Former Ford Distribution Site, Centre Park Road, Cork, comprising demolition of existing structures and construction of a mixed-use development including apartments, commercial and community facilities.
Cork County Council	20/6955	Goulding Chemicals Limited and Belvelly Marino Development Company DAC	Belvelly Port Facility, in the townland of Marino, Marino Point, Cobh, Co. Cork	The construction of a new agricultural fertiliser facility for use by Goulding Chemicals Limited; and additional port operational use of the jetty to facilitate cargo vessels. An EIAR, and NIS will be submitted with the application.
Cork City Council	n/a	University College Cork &	University College Cork, Distillery Fields,	Construction of a new purpose-built research facility comprising of approximately 16,325m^2 (GIA) rising from 4 storeys at the east to 7

Competent Authority	Application No.	Applicant Name	Location	Description
		Tyndall National Institute	North Mall, Cork, T23 XA50	storeys at the west accommodating mix of research laboratories, seminar rooms, offices, exhibition space and café.
Cork County Council	21/5132	Pfizer Ireland Pharmaceuticals	Townlands of Ballintaggart and Ballybricken, Ringaskiddy, County Cork, P43 X336	The construction of a new five-storey clinical manufacturing building, associated buildings, utilities, pipe rack, and associated site development works.
Cork City Council	n/a	Progressive Commercial Construction Ltd	Carey Tool Hire site, Albert Quay, Cork City, bounded by Albert Quay East to the north, Albert Street to the west, Albert Road to the south, and Navigation Square to the east	Office building 5-12-14-16 storeys over ground floor, external terraces at Levels 2, 6, 13, & 15; two levels of basement for parking; café/deli & restaurant with outdoor seating; refurbishment 2no. Protected Structures; Demolition of Carey Tool Hire.
An Bord Pleanála	ABP-310798-21	EirGrid plc	County Cork, between the existing Knockraha substation in the townland of Ballynanelagh in County Cork and Claycastle Beach in Youghal in the townland of Summerfield in Co. Cork	That portion of the Celtic Interconnector project to be constructed onshore in Ireland, to the Mean High-Water Mark (HWM), including an electricity converter station in the townland of Ballyadam east of Carrigtwohill in County Cork.
Cork County Council	21/5965	Kilsaran Concrete Unlimited Company	Barryscourt and Rossmore townlands, Carrigtwohill, Co. Cork	The development will comprise continuance of use of the existing quarry development within an overall application area of c. 24ha; extraction to the permitted level of 40m below Ordnance Datum, within the area permitted under P. Ref. 03/4570.
Cork County Council	21/6983	Lagan Materials Ltd	Rossmore Townland, Carrigtwohill, Co. Cork	Permission sought for deepening the existing quarry from -20mOD to -50mOD within the existing permitted quarry footprint (P. Ref. S/02/5476; ABP Ref. PL04.203762; & ABP Ref. PL04.QD.0010) within an application area of 12ha.
Cork County Council	21/7265	Dawn Meats Ireland and EMR Projects Ltd	Lands at Water Rock, Midleton, Co. Cork	Two separate residential developments on adjoining sites at Water Rock, Midleton. EMR development will consist of 284no. residential units and associated buildings. Dawn Meats development will consist of 434no. residential units and associated buildings.
Cork City Council	n/a	Leeside Quays Limited	Kennedy Quay, Marina Walk, Victoria Road and Mill Road, South Docklands, Cork City	3.1426ha at Kennedy Quay & Marina Walk, South Docks, Cork City. Mixed Use: residential, office, entertainment, food & beverage, cinema, retail, and public open space including Odlums Building (RPS ref. PS856) and rehabilitation hospital, all over double basement.
EPA	n/a	Irish Water	Cork Lower Harbour Ringaskiddy, Shanbally, Co. Cork	The provision of wastewater collection systems and treatment facilities in the Cork Lower Harbour area, with the wastewater treatment plant treating waste from Carrigaline, Crosshaven, Shanbally, Coolmore, Ringaskiddy, Passage West, Glenbrook, Monkstown & Cobh.

Competent Authority	Application No.	Applicant Name	Location	Description
An Bord Pleanála	ABP-313216-22	Estuary View Enterprises 2020 Limited	Bessborough, Ballinure, Blackrock, Cork	Facilities, café, crèche, and all ancillary site development works.
An Bord Pleanála	ABP-313206-22	Estuary View Enterprises 2020 Limited	Bessborough, Ballinure, Blackrock, Cork	Demolition of 10no. existing agricultural buildings/sheds and log cabin residential structure and the construction of a residential development of 140no. apartment units, resident amenity facilities, crèche, and all ancillary site development works.
An Bord Pleanála	ABP-313277-22	Tiznow Property Company Limited (Comer Group Ireland)	Former Tedcastles Yard, Centre Park Road and the Marina, Cork	The demolition of existing structures and the construction of a strategic housing development of 823no. apartments in 6no. buildings ranging in height from part-1 to part-35no. storeys over lower ground floor level.
Cork County Council	n/a	Merck Millipore Ltd	Tullagreen, Carrigtwohill, Co. Cork, T45KD29	The demolition of an existing switch room and an existing drum store and the construction of a new 3-storey manufacturing building, a two storey Utilities Building, a single drum store, expansion to WWTP and Tank Farm with all associated site works.
An Bord Pleanála	ABP-313720-22	Reside Investments Limited	Kilmoney Road, Carrigaline, Co. Cork	Consists of Strategic Housing Development providing 224no. residential units, a creche/childcare facility and 3no. retail units and all associated works.
An Bord Pleanála	ABP-313919-22	Hibernia Star Limited	Jacobs Island, Ballinure, Mahon, Cork	The development will consist of the construction of 489no. apartments, creche and offices in 5 no. buildings ranging in height from part-1 to part-8 no. storeys over lower ground and semi-basement podium levels.
An Bord Pleanála	BP-315087-22	Córas Iompair Éireann (CIÉ)	Traverses through the townlands of Anngrove; Ballyadam, Ballyrichard More; Broomfield East; Broomfield West; Carrigane; Carrigtwohill; Harpers Island; Johnstown; Killacloyne; Killahora, Co. Cork	Twin tracking of the existing single-track sections of railway between Glounthaune and Midleton, Co. Cork.
Cork City Council	22/41675	University College Cork & Tyndall National Institute	Lee Maltings, Dyke Parade, Cork, T12 PX46 to North Mall, Cork, T23 XA50	Construction of a circa 65m long × 3.5-4.5m wide tri-span bridge on two structural piers connecting the existing Tyndall National Institute campus on the south to Tyndall National Institute's New Facility on the North (subject to OPW Section 50 approval).
Cork City Council	2023101	Michelle Price	ESB Aghada Generating Station, Ballincarronig, Aghada, Co. Cork Ireland P25 XE94	299MW Open cycle gas turbine (OCGT) electricity generator and associated infrastructure and buildings.
Cork County Council	2019026	Roadstone Limited	Midleton Quarry located in the townlands of Castleredmond, Carrigshane and Coppingerstown, Midleton, Co. Cork.	Waste soils recovery facility for the importation of approx. 1.4Mm3 of inert soil and stones material; final restoration and landscaping for agricultural use; internal access track linking with adjacent permitted Coppingerstown Quarry; ancillary services.
EPA	2023114	Uisce Éireann	Midleton and Carrigtwohill Wastewater Network	An EIAR is to be submitted to the EPA in support of a review application for the

Competent Authority	Application No.	Applicant Name	Location	Description
			Agglomeration and Wastewater treatment plants, Co. Cork,	Midleton Agglomeration Wastewater Discharge licence D0056-01.
An Bord Pleanála	2023164	Cork County Council	Over the N25 and the Cork City to Midleton Cobh railway line from Little Island train station to Eastgate Business Park within the townlands of Kilcoolishal and Castleview at Little Island, Co. Cork.	The Proposed Development involves the construction of a 5m wide pedestrian and cycle crossing from Little Island train station and the L3004 Glounthaune Road to the Eastgate Business Park and surrounds. The crossing length is approximately 460m in total.

Owing to their proximity to the proposed Carrigtwohill to Midleton IUCR Phase 2 and the Natura 2000 sites concerned, as well as their nature and scale, the following projects were deemed to be the most relevant in terms of the potential for negative effects in combination with the proposed development: -

- EirGrid Celtic Interconnector, including electricity converter station in Ballyadam, east of Carrigtwohill,
- Dawn Meats and EMR Projects residential developments at Water Rock, Midleton,
- Merck Millipore new buildings and expansion to WwTP in Tullagreen, Carrigtwohill,
- CIÉ twin tracking of the existing single-track sections of railway between Glounthaune and Midleton, and
- Midleton and Carrigtwohill Wastewater Network Agglomeration and WwTPs.

In the context of the existing land use and habitats within the footprint of and adjoining these projects and the sensitivities of the Great Island Channel SAC and Cork Harbour SPA, and given the nature and scale of these projects, it is considered that they do not have any potential to give rise to adverse effects on any Natura 2000 sites in combination with the proposed development.

Furthermore, Uisce Éireann's planned upgrades to the wastewater networks and treatment plants discharging to Cork Harbour and connected waterbodies (as discussed in more detail below), ensure that adequate treatment is provided for wastewater from these and other projects before discharge to receiving waterbodies, thereby preventing negative effects on water quality in the Great Island Channel SAC and Cork Harbour SPA.

Small-scale Projects

Searches of the *Cork County Council Planning Viewer* and *Cork City Council Planning Viewer* found that, since 1st January 2017, there have been c. 10,000 No. planning applications to these two local authorities for projects within c. 1km of the Great Island Channel SAC and Cork Harbour SPA and connected waterbodies.

The nature and scale of these projects vary considerably, but they are generally of less concern in terms of their potential environmental effects than those identified through the *EIA Portal* (though there is some overlap). They include a large number of domestic projects such as retention of existing dwelling houses and associated structures, or modifications to same, or the construction of new domestic dwellings or extensions to dwellings, including new connections to the public wastewater network, or associated septic tanks or other on-site treatment.

Regarding potential impacts to water quality, such projects must comply with the EPA's *Code of Practice for Wastewater Treatment Systems for Single Houses* (EPA, 2009, 2018, 2021). Furthermore, Uisce Éireann's planned upgrades to the wastewater networks and treatment plants discharging to Cork Harbour and connected waterbodies (as discussed in more detail below), ensure that adequate treatment is provided for wastewater from such projects (where they are within urban wastewater agglomerations) prior to discharge to the receiving waterbodies, thereby preventing negative effects on water quality in the Great Island Channel SAC and Cork Harbour SPA. Therefore, such projects are not likely to have any significant effects in combination with the proposed Carrigtwohill to Midleton IUCR Phase 2.

Licensed Activities

A review of licensed activities through *EPA Maps* found that there are 46 No. activities licences by the EPA in the vicinity of the Great Island Channel SAC and Cork Harbour SPA and connected waterbodies. These included the following: -

- 8 No. Integrated Pollution Control (IPC) licences for: -

Licence No.	Licensee	Location
P0028-01	Mr Brian Moran, Mr Tom Coughlan, and Mr Hugh O'Regan	Marino Point, Cobh, Cork
P0218-01	Dulux Paints Ireland Ltd	Shandon Works, Commons Road, Cork
P0246-01	Georgia Holdings Ltd trading as Youghal Carpet Yarns	Killacloyne, Carrigtwohill, Cork
P0251-01	Rothbury Manufacturing Ltd	Sunbeam Industrial Park, Millfield, Blackpool, Cork
P0273-01	Cork Fabrication Services Ltd	Rushbrooke Commercial Park, Rushbrooke, Cork
P0343-01	Brooks Haughton Ltd	Pouladuff Industrial Estate, Togher, Cork
P0389-01	Goldenville Ltd	Wallingstown, Little Island, Cork
P0445-01	Heineken Ireland Ltd	Lady's Well Brewery, Cork

- 33 No. Industrial Emissions (IE) licences for: -

Licence No.	Licensee	Location
P0004-06	Thermo Fisher Scientific Cork Ltd	Currabinny, Carrigaline, Cork
P0006-04	Novartis Ringaskiddy Ltd	Ringaskiddy, Cork
P0010-05	Hovione Ltd	Loughbeg, Ringaskiddy, Cork
P0013-05	Pfizer Ireland Pharmaceuticals (Ringaskiddy)	PO Box 140, Ballintaggart, Ringaskiddy, Cork, P43 X336
P0016-02	Janssen Pharmaceutical Sciences UC	Wallingstown, Little Island, Cork
P0017-02	Cara Partners	Little Island Industrial Estate, Cork
P0034-03	Marinochem Ltd	Marino Point, Cobh, Cork
P0052-02	BASF Ireland Ltd	Inchera and Wallingstown, Little Island, Cork
P0091-03	Wexport Ltd	Wallingstown, Little Island, Cork, T45 RP82
P0136-04	Upjohn Manufacturing Ireland Unlimited Company	Wallingstown, Little Island, Cork, Cork
P0196-01	FLEXcon Company Incorporated	Carrigtwohill Industrial Estate, Tullagreen, Carrigtwohill, Cork
P0266-03	Irving Oil Whitegate Refinery Ltd	Whitegate, Midleton, Cork
P0316-01	Mr James O'Brien	Ballintubbrid East, Carrigtwohill, Cork
P0391-01	Galco (Cork) Ltd	Tramore Road, Cork
P0399-01	John A. Wood (Burnt Lime) Ltd	Carrigtwohill Quarry, Ballyvodock, Carrigtwohill, Cork
P0407-01	Irish Pioneer Works (Fabricators) Ltd	Kinsale Road, Cork, T12 K7XR
P0442-02	Irish Distillers Ltd	Midleton Distilleries, Midleton, Cork
P0476-02	Recordati Ireland Ltd	Raheens East, Ringaskiddy, Cork
P0561-05	Electricity Supply Board (Aghada)	Aghada Generating Station, Whitegate, Midleton, Cork
P0571-04	Merck Millipore Ltd	Tullagreen, Carrigtwohill, Cork, T45 KD29
P0578-03	Electricity Supply Board (Marina)	Marina Generating Station, Centre Park Road, Cork

Licence No.	Licensee	Location
P0778-02	Janssen Sciences Ireland UC	Barnahely, Ringaskiddy, Cork, P43 FA46
P0830-02	Bord Gáis Energy Ltd	Whitegate Power Station, Whitegate (Corkbeg and Glanagow townlands), Cork
P0864-01	BioMarin International Ltd	Ballintaggart, Shanbally, Ringaskidddy, Cork
P0997-01	The Hammond Lane Metal Company Ltd.	Ringaskiddy, Cork
P1018-01	Little Island BioEnergy Ltd	Inchera, Little Island, Cork
P1046-01	Fournier Laboratories Ireland Ltd trading as AbbVie	IDA Industrial Estate, Anngrove, Carrigtwohill, Cork
P1114-01	Indaver Ireland Ltd	Ringaskiddy Resource Recovery Centre, Ringaskiddy, Co. Cork
P1117-01	Architectural & Metal Systems Ltd	Wallingstown, Little Island, Cork, T45VP40
W0012-03	Kinsale Road Landfill	Ballyphehane, Curraghconway, Inchisarsfield, South City Link Road, Cork
W0145-02	Enva Ireland Ltd (Cork)	Unit 9, Raffeen Industrial Estate, Raffeen, Monkstown, Cork
W0186-01	Indaver Ireland	Ringaskiddy, Cork
W0291-02	Forge Hill Recycling Unlimited Company	Forge Hill Waste Transfer Station, Forge Hill, Cork, T12 AK44

- 5 No. Waste licences for: -

Licence No.	Licensee	Location
W0022-01	East Cork Landfill Site	Rossmore, Carrigtwohill, Cork
W0023-01	Raffeen Landfill Site	Raffeen, Kerrycurrihy, Cork
W0132-01	Lotamore	Glanmire, Cork
W0171-01	Materials Recovery & Transfer Facility	Forge Hill, Kinsale Road, Ballycurreen, Cork
W0289-01	The East Tip	Haulbowline Island, Cork

Some of the above licences are currently pending approval, while others may no longer be in use. Based on the nature and scale of these activities, a risk of significant in-combination effects on Natura 2000 sites via water quality impacts must be considered. However, given the conditions attached to the IPC and IE licences and enforcement of the same by the EPA, and the very low risk of any significant water quality impacts in Cork Harbour from the proposed Carrigtwohill to Midleton IUCR Phase 2, there is not likely to be any significant effects in combination with from these activities the proposed development.

Wastewater Treatment Plants and Networks

Upper Cork Harbour

The proposed Carrigtwohill to Midleton IUCR Phase 2includes a new inter-urban cycle way, beginning just north of the Cork to Midleton Railway Line within lands zoned for the Carrigtwohill Urban Expansion Area (UEA). The route connects to Phase 1 via a short link of active travel infrastructure being developed as part of the Carrigtwohill Urban Regeneration and Development Fund (URDF) Initiative – UEA Infrastructure.

As part of the Carrigtwohill URDF Initiative, new wastewater infrastructure to accommodate future development within the Carrigtwohill UEA is proposed. This new infrastructure will feed into the existing Carrigtwohill Wastewater Treatment Plant (WwTP), which discharges treated effluent to the Lough Mahon (Harper's Island) transitional waterbody, within the Great Island Channel SAC and a short distance upstream of the Cork Harbour SPA. The Carrigtwohill WwTP can provide tertiary treatment (including nitrogen and phosphorus removal) for a population equivalent (p.e.) of up to 30,000. The current load is 10,010 p.e. (as of 2021) and the WwTP passed its Water Framework Directive (WFD) compliance test in 2021. This leaves adequate capacity for future from the

developments envisaged as part of the UEA. Furthermore, Uisce Éireann will progress any WwTP and network upgrades as required and in advance of treatment headroom being exhausted.

The Midleton WwTP can provide tertiary treatment (including nitrogen removal) for 15,000 p.e. but is currently overloaded, with an agglomeration p.e. of 16,376 (as of 2021). Nevertheless, it passed its WFD compliance test in 2021. This plant discharges to the Owenacurra Estuary transitional waterbody, which is connected to the North Channel Great Island transitional waterbody. In addition, on 13th February 2023, Cork County Council granted planning permission for the Midleton North Wastewater Pumping Station and Network (Planning Ref. 22/05032), which will provide for the diversion of loads of c. 4,100 p.e. from the Midleton wastewater network to Carrigtwohill, which, as demonstrated above, currently has treatment headroom of almost 20,000 p.e. This will bring the effective loading to the Midleton WwTP within its design capacity without significantly reducing the capacity of the Carrigtwohill WwTP to accommodate expected loading from future UEA development.

The Cork City WwTP provides tertiary phosphorus removal for 231,000 p.e., the plant capacity is 413,200 p.e. and it passed its WFD compliance test in 2021. This WwTP is located at Carrigrenan, Little Island and discharges to the Lough Mahon transitional waterbody, which overlaps with the Great Island Channel SAC and Cork Harbour SPA and is connected to the Glashaboy Estuary and Lee (Cork) Estuary Lower. There is no existing or proposed connection between the Carrigtwohill and Cork City wastewater networks.

The current WFD ecological status or potential and risk of not achieving WFD objectives by 2027 for each of the transitional waterbodies to which the three WwTPs concerned discharge are provided in Table 8-2 below. While these are identified as being at risk in many cases, Uisce Éireann's planned upgrades to the wastewater networks and treatment plants discharging to Cork Harbour and connected waterbodies should significantly assist in the aim to achieve good water quality status in these waterbodies.

Table 7-2 - WFD Status and Risk for transitional waterbodies covering the Great Island Channel SAC and inner sectors of the Cork Harbour SPA and to which the Carrigtwohill, Midleton and Cork City WwTPs are connected.

Transitional Waterbody	WFD Status 2016-2021	Risk (re 2027)
Slatty Bridge, Fota Island	Unassigned	Review
Lough Mahon (Harper's Island)	Moderate	At risk
Lough Mahon	Moderate	At risk
Glashaboy Estuary	Bad	At risk
Lee (Cork) Estuary Lower	Moderate	At risk
Owenacurra Estuary	Moderate	At risk
North Channel Great Island	Moderate	At risk

Given the existing capacity at the Carrigtwohill WwTP and Uisce Éireann's planned WwTP and network upgrades, the proposed new wastewater infrastructure will not facilitate future loading to the Carrigtwohill WwTP, i.e., from envisaged UEA developments, including in combination with future loads diverted from the Midleton network, which could lead to overloading of the WwTP and consequent negative impacts on water quality in the Great Island Channel SAC and Cork Harbour SPA. As such, significant effects on these sites in combination with future UEA development can be ruled out.

Lower Cork Harbour

Large WwTPs in discharging to the outer sectors of the Cork Harbour SPA and connected waterbodies include Ringaskiddy, Cobh North and Cloyne. The Ringaskiddy WwTP at Shanbally provides secondary treatment for 45,602 p.e. from Ringaskiddy Village, Ringaskiddy-Crosshaven-Carrigaline, Passage-Monkstown and Cobh Town, the plant capacity is 65,000 p.e. but it failed its WFD compliance test in 2021 due to discharges of industrial effluent downstream of the WwTP. The Cobh North provides secondary treatment for 1,135 p.e. and the plant capacity is 2,000 p.e. The Cloyne WwTP provides secondary treatment for 1,400 p.e., the plant capacity is 2,040 p.e. but it passed its WFD compliance test in 2021.There is no treatment provided for wastewater from Whitegate-Aghada (2,328 p.e.). As noted, the WFD status of transitional and coastal waterbodies to which these networks discharge and are connected are all 'Moderate' and 'At risk'.

Overall, the discharge from these wastewater networks is not considered to be significantly affecting the Cork Harbour SPA and, given the absence of effects from the proposed development individually or in combination

with the Carrigtwohill, Midleton and Cork City WwTPs (and future UEA development), it can be concluded that there will be no such effects in combination with these other wastewater networks.

Aquaculture

EPA Maps shows 4 No. areas designated under the Shellfish Waters Directive (2006/113/EC), as transposed into Irish law by European Communities (Quality of Shellfish Waters) Regulations, 2006 (as amended), in Cork Harbour. The largest of these is “Cork Great Island North Channel”, which occupies approximately the middle third of the Great Island Channel and so overlaps with both the Great Island Channel SAC and Cork Harbour SPA. In addition, the “Rostellan North”, “Rostellan South” and “Rostellan West” shellfish areas overlap the north-eastern sector the Cork Harbour SPA in the Lower Harbour. Under the Shellfish Waters Directive, the quality of these waters must be protected from pollution and meet specific targets for physical, chemical, and microbiological parameters in order to support bivalve and gastropod molluscs.

A review of *Ireland’s Marine Atlas* found 3 No. licensed aquaculture sites in Cork Harbour. These include a small area to the west of Brick Island, where Fota Oyster Farm Ltd is licensed to produce Pacific Oyster and Brown Seaweeds, a larger area to the east of Brick Island, where Atlantic Shellfish Ltd is licensed to produce Pacific Oyster, and a large area covering the north-eastern part of the Lower Harbour, where Atlantic Shellfish Ltd is licensed to produce Blue Mussel. The two sites near Brick Island are both within the Great Island Channel SAC and Cork Harbour SPA, while the large Blue Mussel site overlaps the Cork Harbour SPA only.

In its AA of aquaculture activities in Cork Harbour (October 2022), the Department of Agriculture, Food and the Marine found that, given the types of aquaculture practised, as well as the scale and location of activities, such activities do not pose a threat to the Great Island Channel SAC or Cork Harbour SPA. On the basis of that assessment and given the nature, scale, and location of the proposed Carrigtwohill to Midleton IUCR Phase 2, no significant effects will arise from the proposed development in combination with aquaculture.

Other Activities

Farmers and landowners may also undertake general agricultural operations in areas adjacent to the proposed works and along watercourses, which could potentially give rise to impacts of a similar nature to those arising from the proposed development. This could potentially result in additional an increased risk to water quality. Many agricultural operations are periodic, not continuous in nature, and qualify as Activities Requiring Consent (ARCs) that require consultation with the NPWS in advance of the works, e.g., reclamation, infilling or land drainage within 30m of a river, removal of trees or any aquatic vegetation within 30m of a river, and harvesting or burning of reed or willow (NPWS, 2022a). Agricultural operations must also comply with the European Communities (Environmental Impact Assessment) (Agriculture) Regulations, 2011 (as amended) in relation to:

- Restructuring of rural land holdings,
- Commencing use of uncultivated land or semi-natural areas for intensive, and
- Land drainage works on lands used for agriculture.

Stage 2 AA is required under Regulation 9 if it is likely to have a significant effect on a Natura 2000 site. The drainage or reclamation of wetlands is controlled under the Planning and Development (Amendment) (No. 2) Regulations, 2011 and the European Communities (Amendment to Planning and Development) Regulations, 2011. Therefore, any in-combination effects from agricultural operations and the proposed works are not likely to be significant.

The harbour, as well as the catchments of watercourses which enter the harbour, are also subject to a diverse range of other impacts arising from forestry, sports and recreation, shipping, military uses etc.

7.4. Conclusion

As detailed in the preceding sections, it can be concluded that, based on the nature of the proposed development and its integration with other projects under the Carrigtwohill URDF Initiative, UEA Masterplan and Cork County Development Plan, it will not give rise to significant effects on any of the Natura 2000 sites within the Zone of Influence, in combination with other plans or projects.

8. Conclusion

This AA Screening Report has examined the details of the proposed Carrigtwohill to Midleton Inter-urban Cycleway Phase 2 and the Natura 2000 sites in its Zone of Influence. It has analysed the potential impacts of the proposed development on the receiving natural environment and evaluated their effects, both individually and in combination with other plans and projects, in view of the conservation objectives of the relevant Natura 2000 sites. This report has been prepared in line with the Habitats Directive, as transposed into Irish law by the Habitats Regulations, relevant case law and guidance from the European Commission, the relevant Government Departments, and the Office of the Planning Regulator, on the basis of objective information and adhering to the precautionary principle.

Following the assessment detailed in this report, it is concluded that the proposed development will not, either individually or in combination with other plans or projects, give rise to impacts which would constitute significant effects on the Great Island Channel SAC, Cork Harbour SPA or any other Natura 2000 site, in view of their conservation objectives. Therefore, it recommended that Cork County Council, as the competent authority, may determine that Appropriate Assessment is not required in respect of the proposed development. Should any aspect of the design or construction methodology for the proposed development be materially changed, a new AA Screening Report would be required.

9. References

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