AtkinsRéalis

Appropriate Assessment Screening Report

Clockstrike Limited

December 2025

5208317DG0025

Ringwood Phase 2 Development, Station Road, Blarney



AtkinsRéalis - Baseline / Référence

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Phase 2 Ringwood LRD

Screening for Appropriate Assessment

Clockstrike Ltd.

10/12/2025

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1. Introduction

1.1. Background / Project Location

Clockstrike Ltd. seeks permission for a Largescale Housing Development (LRD) at lands at Ringwood, Shean Upper, Blarney, in the northwest of Cork City.

The lands comprise parts of six gently undulating fields currently in agricultural use and with established boundaries including hedgerows, as well as an area of woodland to the northeast of the proposed development site. The fields do not directly border the Ringwood, a circular wooded area on the brow of a hill. The site also abuts Aisling Geal, Assumption Terrace, and the R617 road to the south. The site location is demonstrated in Figure 1-1 below.

The proposed LRD (hereafter referred to as “the proposed development”) will consist of Phase 2 of the development in the Blarney East / Ringwood Expansion Area, and comprising the construction of the following: 323 no. residential dwellings comprising of 157 no. terraced, end-of-terrace, and detached houses; 52 no. duplexes provided in 5 no. 3-storey buildings; and 114 no. apartments provided in 2 no. 5-storey buildings.

The proposed development also includes a primary care centre, over 2 no. stories, incorporating GP services, the refurbishment and redevelopment of existing farm outbuildings for conversion to a retail/pharmacy use and café/restaurant us as well as a new access roadway into the site from the R617 with associated pedestrian and cyclist infrastructure, which will form the 1st phase of the proposed Stoneview Access Link Road, a new signalised junction on the R617 road which will provide a single lane approach to the west and a two lane approach to the east, comprising one lane for through traffic on the R617 and a right turn lane for traffic turning into the site, and associated footpath improvements and cycle lane provision, and a new signalised junction on Station Road that reflects the junction permitted under the Phase 1 LRD scheme (Reg. Ref. 2443031).

Also proposed are private communal, and public open spaces and hard and soft landscaping, boundary treatments and amenity areas, including a new wetland public amenity area, drainage works and nature-based SuDS measures, foul sewer infrastructure, including 1no. pump station, the diversion of existing foul and water sewers and other new network works, car parking, including EV charging points, bicycle parking, and motorcycle parking bays, 2 no. substations and all associated ancillary site, drainage and development works.

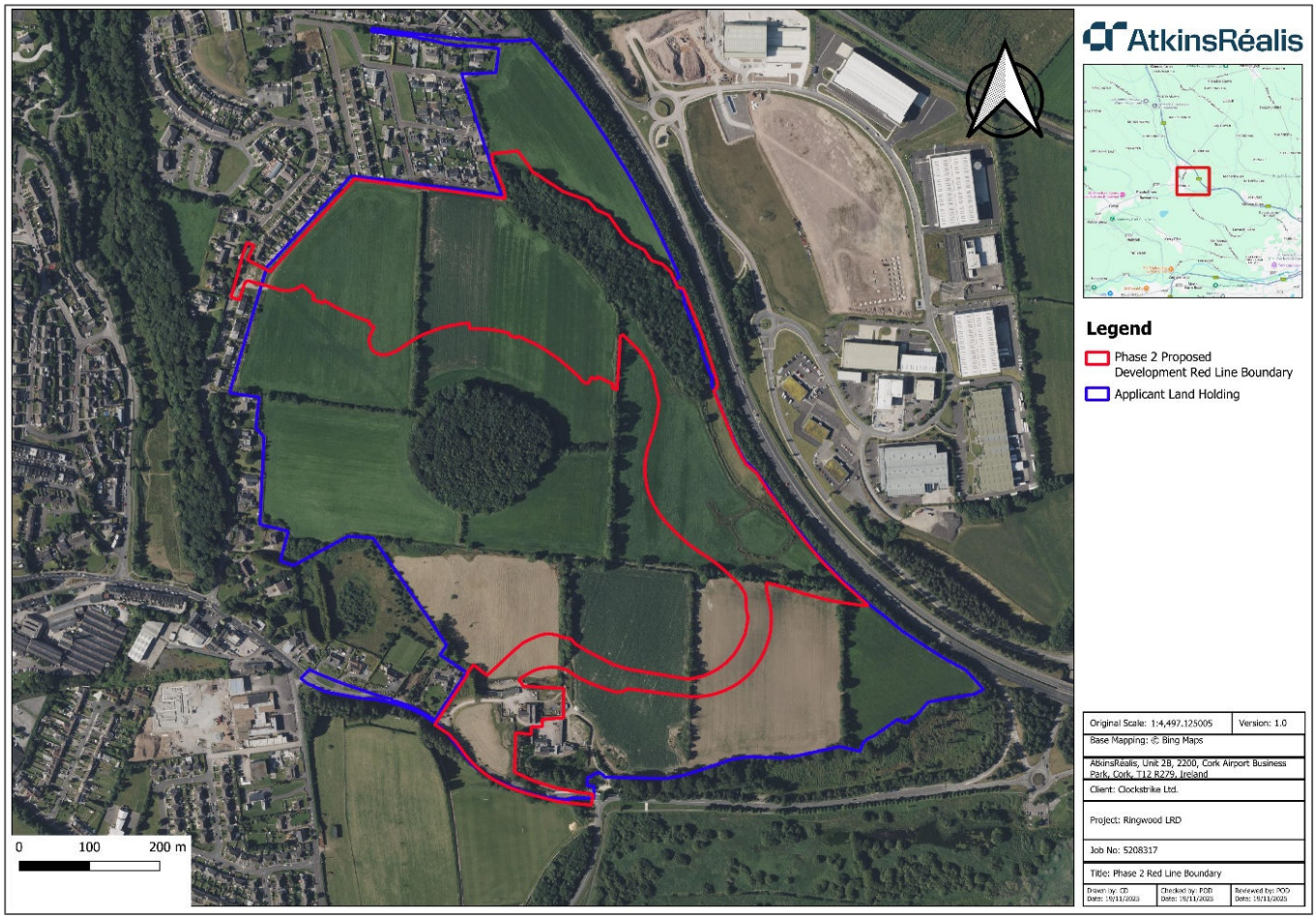


Figure 1-1 - Site location for the proposed project shown outlined in red (Source: AtkinsRéalis, 2025).



Figure 1-2 – Proposed Phase 2 layout (Source: CCK Architects).



Figure 1-3 - Proposed Phase 2 layout - Residential (Source: CCK Architects).

2. Scope of Study

2.1. Legislative Context

2.1.1. 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 and other regularly occurring migratory species. 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.

2.1.2. 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.

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 2.2 below).

2.1.3. 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.

2.2. 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 0 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 2-1 below.

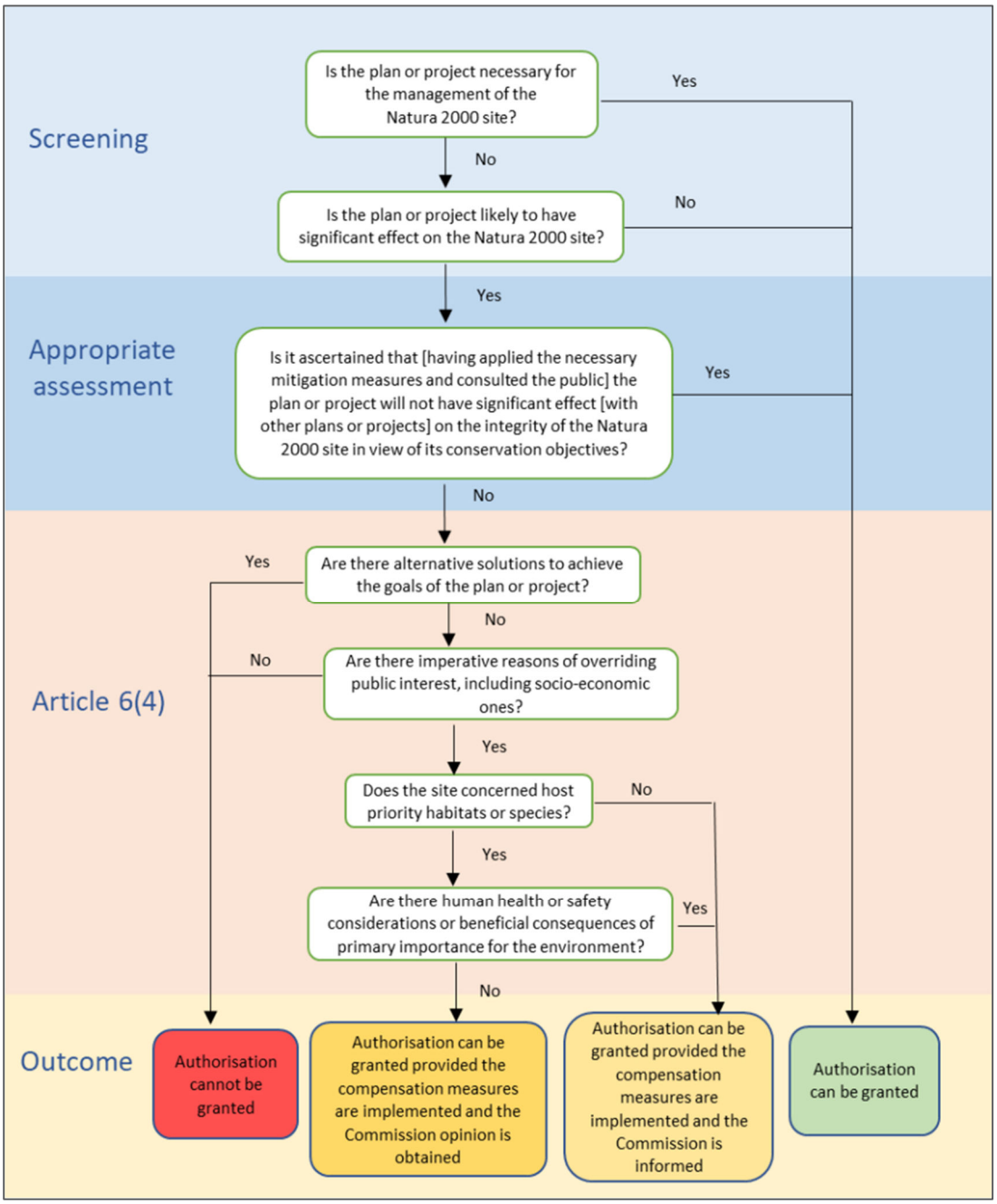


Figure 2-1 - Stages of the Appropriate Assessment process (EC, 2021).

3. Methodology

3.1. 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").
- Planning and Development Regulations, 2001. S.I. No. 600/2001 (as amended) ("the Planning Regulations").
- EC (2019). *Managing Natura 2000 sites – The provisions of Article 6 of the Habitats Directive 92/43/EEC.* European Commission, Brussels. *Official Journal of the European Union* C 33/1-62.
- EC (2021a). *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. *Official Journal of the European Union* C 437/1-107.
- EC (2021b). *Guidance document on the strict protection of animal species of Community interest under the Habitats Directive. C (2021) 7301.* European Commission, Brussels.
- DG Env (2022a). *Guidance document on assessment of plans and projects in relation to Natura 2000 sites – A summary.* Directorate-General for Environment, European Commission, Brussels. Publications Office of the European Union, Luxemburg.
- 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.
- NPWS (2012). *Marine Natura Impact Statements in Irish Special Areas of Conservation. A Working Document. April 2012.* National Parks & Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin.
- NPWS (2021). Guidance on the Strict Protection of Certain Animal and Plant Species under the Habitats Directive in Ireland. *National Parks & Wildlife Service Guidance Series* 1, Department of Housing, Local Government and Heritage, Dublin.
- Mullen, E., Marnell, F. and Nelson, B. (2021). Strict Protection of Animal Species – Guidance for Public authorities on the Application of Articles 12 and 16 of the EU Habitats Directive to development/works undertaken by or on behalf of a Public authority. *National Parks & Wildlife Service Guidance Series* 2, Department of Housing, Local Government and Heritage, 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).

- Sundseth, K. and Roth, P. (2014). *Article 6 of the Habitats Directive – Rulings of the European Court of Justice.* Ecosystems LTD (N2K Group), Brussels.

3.2. Desk Study

Baseline data on the biodiversity and ecology of the receiving environment was gathered through a desk study.

The boundaries of Natura 2000 sites were downloaded from NPWS: Maps and Data (https://www.npws.ie/maps-and-data). Information on sites, including their overall structures and functions, qualifying interests, conservation objectives and threats/pressures and activities therein, was found in the Site Synopsis, Natura 2000 Standard Data Form, Conservation Objectives and supporting documents for each site. Spatial data for site-specific conservation objectives of Natura 2000 sites, and boundary data for other designated sites, such as Natural Heritage Areas, was also retrieved from NPWS: Maps and Data. Reporting under Article 17 of the Habitats Directive (NPWS, 2019; Article 17 web tool) and Article 12 of the Birds Directive (NPWS, 2025c; Article 12 web tool) provided further information on the habitats and species concerned at the national level.

Information relating to recent and historical records of species was obtained from the National Biodiversity Data Centre (NBDC) Biodiversity Maps (https://maps.biodiversityireland.ie/Map), while data for other features of the natural environment, e.g. known occurrences of non-qualifying interest Annex I habitats, were viewed using publicly available Article 17 Data from the NPWS (https://www.npws.ie/maps-and-data/habitat-and-species-data/article-17/2019).

The Environmental Protection Agency (EPA) map viewer EPA Maps: Water (https://gis.epa.ie/EPAMaps/ Water) and spatial data for river, lake, canal, transitional and coastal waterbodies downloaded from the EPA Geoportal (https://gis.epa.ie/GetData/Download) was used to identify any hydrological connection between the proposed development and Natura 2000 sites or connected features. Satellite and aerial imagery from Google Earth, Bing Maps and Tailte Éireann was reviewed to identify hedgerows, treelines and other potential ecological features.

In addition, reports from ecological surveys and site visits previously undertaken at the location of the proposed development were also reviewed, having due regard to the *Advice note on the lifespan of ecological reports and surveys* (CIEEM, 2019).

In order to inform the assessment of potential in-combination effects, planning applications from the surrounding area were reviewed using the *National Planning Application Database* (https://housinggovie.maps.arcgis.com/apps/webappviewer), An Bord Pleanála's *Map Search* (https://www.pleanala.ie/en-ie/map-search) and the *EIA Portal* (https://www.gov.ie/en/publication/9f9e7-eia-portal/).

3.3. Site Visits

A preliminary ecological walkover survey of the site was conducted by John Deasy on the 26th August and 5th December 2021. The purpose of the survey was to characterise and record the habitats and sensitive ecological receptors within and adjacent to the channels included in the site; note that all lands within the applicants ownership were subject to surveying (including Phase 2 lands) (see Figure 1-1 above). At this time a Phase 1 habitat survey was undertaken in line with published practice (Smith *et al*., 2011), with habitats classified in line with the Heritage Council Classification scheme (Fossitt, 2000). Dominant plant species in each habitat type were recorded. Plant nomenclature follows the Botanical Society of Britain and Ireland's List of Accepted Plant Names (Botanical Society of Britain and Ireland, 2007). Habitats were later mapped using MapInfo v16 GIS software. During the ecological survey the presence of invasive plant species such as Japanese knotweed (*Fallopia japonica*), Himalayan balsam (*Impatiens glandulifera*) and Giant Hogweed (*Heracleum mantegazzianum*) was also looked for. Incidental sightings and signs of birds, mammals, invertebrates and amphibians were noted during the walkover survey to further evaluate the importance of the site to flora and fauna [in line with the approach set out in the *Guidelines for Preliminary Ecological Appraisal* (CIEEM, 2017) and *Guidelines for Ecological Impact Assessment* (CIEEM, 2018)]. The landscape value for bats was also considered (after Entwhistle *et al*., 2001; etc.). With respect to terrestrial mammals the survey searched in particular for mammal

signs, such as badger setts, latrines etc; otter holts; rabbit burrows etc. Given that this survey identified areas of interest for mammals, subsequent mammal trail camera surveys were undertaken by John Deasy in March 2022. These targeted mammal trail camera surveys were further updated by AtkinsRéalis ecologists under a Section 23(6)(b) licence of the Wildlife Act, 1986 (as amended) from the NPWS from July to September 2025 (licence no. 090/2025). Habitats as identified through the Fossitt classification system (2000) in 2021 were further subject to validation by AtkinsRéalis ecologists in April 2025.

The site has been visited multiple times in addition to the above across 2021 to 2025. A targeted woodland survey of the northeastern woodland habitat was undertaken by John Deasy on the 12th September 2024; on behalf of AtkinsRéalis John Deasy also undertook targeted wintering bird surveys (November 2023 to February 2024; monthly visits) and targeted breeding bird surveys (May 2024 and again across April and May 2025).

Aerial photos and site maps assisted all ecological walkover surveys. The location of the proposed project and the surrounding areas were viewed using Google Earth, Google maps and Bing maps. The EPA online mapviewer OSI Discovery series maps were used to locate watercourse networks and identify hydrological connectivity to larger rivers such as the River Shournagh or the River Lee.

A targeted bat survey of the current lands as well as lands to the east of the N20 was undertaken by Karen Banks of Greenleaf Ecology on behalf of AtkinsRéalis from October 2021 to June 2022; this targeted surveying was further updated from September 2024 to September 2025. The objectives of the bat surveys were to: -

- Establish the location of any actual or potential bat roosts at the proposed site.
- Establish the value of the proposed site to bats for foraging and commuting.
- Assess the results of the survey and determine the potential impact of the proposed development on any bats that might use the site.
- Provide recommendations for the project design in light of the survey results as appropriate.
- Provide recommendations for mitigation measures.

Surface waters from the eastern side of the site will be discharged to the Shean Upper Stream which is located within the Phase 2 red line boundary of the proposed development. This stream discharges to Blarney Bog pNHA which is located to the south of the proposed development site (also known as Clogheenmilcon Fen). An assessment of water quality and aquatic ecological diversity in the Shean Upper Stream and the lake within Blarney Bog pNHA was undertaken by Triturus Environmental on behalf of AtkinsRéalis in September and November 2023.

The full results of the above listed surveys are presented in the Biodiversity Chapter of the accompanying Environmental Impact Assessment Report (EIAR) within this planning submission.

3.4. Impact Assessment

The assessment detailed in this report was undertaken in the following steps, following the best practice guidance highlighted in Section 3.1 above: -

1. Description of the proposed works, including their locations, nature, scale, duration, and potential impacts on the natural environment.
2. Description of the 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 works 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.

3.5. Statement of Authority

The Screening for Appropriate Assessment was prepared by Caroline Downey, BSc and Paul O'Donoghue, BSc MSc PhD CEnV MCIWEM of AtkinsRéalis. Paul has over 20 years' experience as an environmental / ecological consultant and has worked on numerous projects involving preparation of Biodiversity chapters for Environmental Impact Assessments. Caroline has a BSc in Ecology and Environmental Biology. She has experience in preparing Appropriate Assessment Screening Reports, Natura Impact Statements and prepares Ecological Impact Assessment Reports and undertakes range of ecological surveys (e.g. mammal and bat surveys) for a range of proposed development sites.

Further specialist support was provided by Karen Banks (Greenleaf Ecology; bats), Ross Macklin (Triturus Environmental; aquatic ecology) and John Deasy (badger, birds).

Karen is an ecologist with 17 years' experience in the field of ecological assessment. She holds a BSc in Environment and Development from Durham University and is a full member of the Chartered Institute of Ecology and Environmental Management. Karen is an experienced and skilled bat surveyor, first gaining a scientific licence to disturb bats from Natural England, UK in 2008. Karen is trained in bat handling and capture methods and currently holds a bat disturbance licence granted by the NPWS (Licence number: DER/BAT 2023-55 (survey licence)). Karen has undertaken bat survey and assessment for numerous projects, including bridge repair and replacement works, domestic dwelling repair and demolition works, wind farm developments and large-scale infrastructure projects such as flood relief schemes, road developments and pipeline schemes. Karen has also represented Cork County Council as an expert witness for bats at an Oral Hearing.

Ross Macklin is a graduate of University College Cork. He has a BSc in Applied Ecology, Higher Diplomas in Integrated Pest Management and Geographical Information Systems. He is completing a PhD in fisheries science at UCC. His expert areas are aquatic ecology and fisheries science. Ross has 18 years of professional experience and worked on many of Ireland's largest infrastructure projects including flood relief schemes, renewables (solar & wind farms), greenways, blueways, residential, roads and biodiversity. He has also worked on projects in the waste management, petrochemical, pharmaceutical, agricultural and aquaculture industry sectors. Ross has held over 30 NPWS national licences for freshwater pearl mussel (*Margaritifera margaritifera*), white-clawed crayfish (*Austropotamobius pallipes*) and amphibian species holding full national licences for all of these species. He also has held over 30 NPWS wildlife filming licences, numerous derogation licences and over 200 section 14 licences for fisheries related work.

John is an independent ecological consultant with experience across a range of ecological disciplines including botanical and habitat surveys, bird surveys, mammal surveys and protected invertebrate surveys. He has over 8 years of experience as a professional ecologist and has undertaken a range of baseline ecological surveys for renewable energy projects, shared-use greenways and domestic and commercial property developments. These surveys have included non-native invasive species surveys, rare and protected species surveys. John holds a MSc. in Ecological Assessment and BSc. in Earth and Environmental Science from University College Cork.

4. Description of the Proposed Works

4.1. Detailed Description of the Proposed Development

4.1.1. Main Features of the Proposed Development

Clockstrike Ltd. intends to apply to Cork City Council for planning permission for a Large-scale Residential Development (LRD) at Ringwood, Blarney, Co. Cork. The site is an existing green field site, well located between the N20 national road, Station Road and the R618 regional road. The development of this site is in keeping with Cork City Council Development Plan 2022-2028, which focusses on developing Blarney into an important hub town to the west of the city.

The proposed development will consist of a LRD representing Phase 2 of development in the Blarney East / Ringwood Expansion Area, and comprising the construction of the following: 323 no. residential dwellings comprising of 157 no. terraced, end-of-terrace, and detached houses; 52 no. duplexes provided in 5 no. 3-storey buildings; and 114 no. apartments provided in 2 no. 5-storey buildings (including a mix of 1-, 2-, and 3-bed units). Phase 1 of the development, as shown below in Figure 4-1, was granted planning permission on the 12th December 2024

The proposed development also includes a primary care centre incorporating GP services, the refurbishment and redevelopment of existing farm outbuildings for conversion to a retail/pharmacy use, and café/restaurant use, and all associated access roads, internal roads and footpaths, soft and hard landscaping and services.

The planning application is accompanied by an Environmental Impact Assessment Report (EIAR).

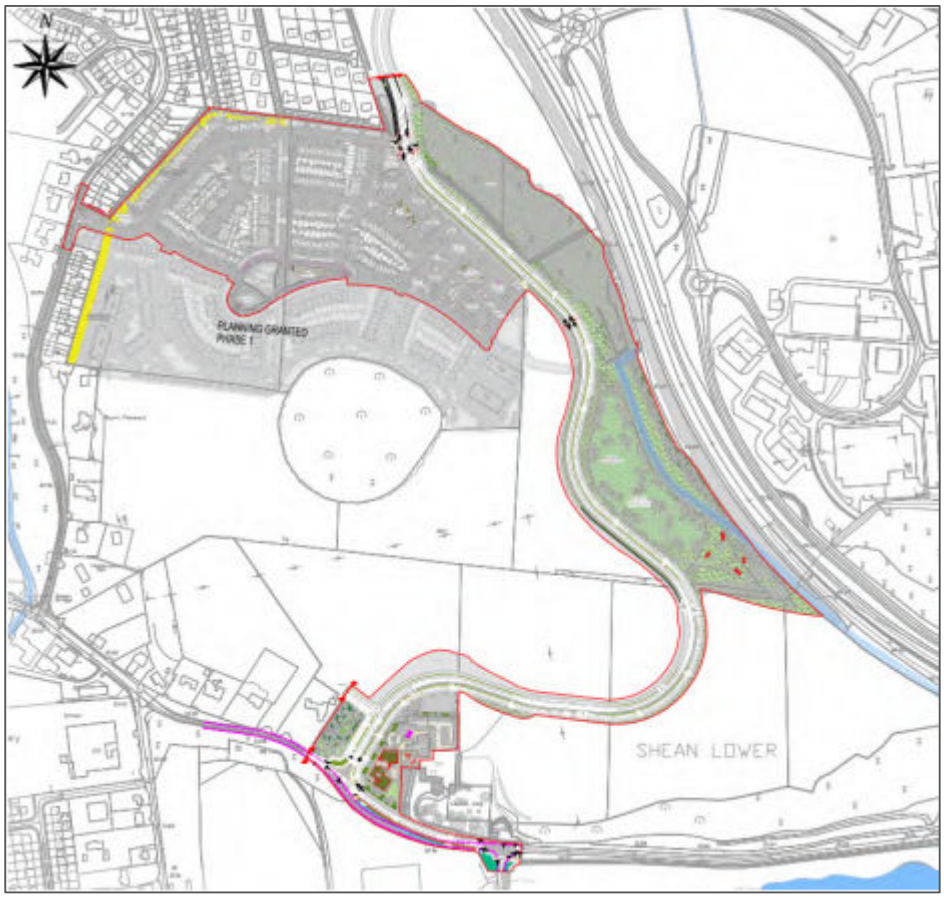


Figure 4-1 Phase 2 Design in the context of the Ringwood lands and Phase 1 development (Source: CCK Architects).

The site location and context are described in further detail in Section 4.2 of the EIAR; refer also to Section 13.3.2.1 Subject Site in the Landscape and Visual Assessment (Chapter 13) which also describes the site context

and how it fits within the landscape. The site will drain west to the River Martin and east to the Shean Upper Stream (refer to MHL, 2025c - *Drainage Impact Assessment. SuDS Statement*).

The upgrade of Station Road / Development Junction is included within the granted planning of Phase 1 development within Ringwood Lands; this arrangement has been arrived at following discussions with Cork City Council, with entre/exit junction onto Station Road designed in accordance with TII Standards. The development access for the proposed development (Phase 2) matches that submitted for Phase 1, with minor changes to account for cycle lane provisions. Included within the proposals are to construct a signalised junction with the R617 and Development Spine Road, upgrading the existing Killard Priority Junction to a fully signalised junction.

The development proposes to connect onto the R617 with a proposed new signalised junction. Extensive traffic analysis for this junction and surrounding road networks has been carried out by Systra Ltd. Please refer to their submitted documentation for further details.

The R617 junction has been designed with a long-term perspective, ensuring it can handle increased traffic volumes, including heavy construction vehicles initially, and subsequently regular vehicular traffic as the development becomes operational. The junction with the R617 has been designed to account for future traffic demand as the development grows.

The proposed phasing will ensure that this site and subsequent lands under our client's ownership can be delivered with local network infrastructure improvements and connections. Subsequent development applications within the wider Ringwood site and Stoneview site, will require more significant connecting infrastructure, including the construction of the rail line and N20 overbridges.

The proposed site layout has been designed by Conroy Crowe Kelly Architects. Refer to the accompanying architectural drawings and planning statement for details of housing to be constructed.

This application in accompanied by an *outline Construction and Environment Management Plan* (MHL, 2025a), a *Planning Engineering Design Report* (MHL, 2025b) and a *Drainage Impact Assessment. SuDS Statement* (MHL, 2025c). Cunnane Stratton Reynolds (CSR, 2025a) also prepared *Landscape Design Rationale.* These documents provide comprehensive supporting information on the site of the proposed development. A full set of drawings also accompanies this assessment and should be read in conjunction with this Screening for Appropriate Assessment report. Key aspects that inform the Screening for Appropriate Assessment are summarised below.

Relevant sections of the Engineering Report which inform and support this assessment include the detailed description of the proposed surface water management system, which is an integral part of the design of the proposed development (see e.g Section 7.3 – Surface Water Drainage Network; MHL, 2025b). Details of this system and other key elements of site infrastructure are provided below.

4.1.1.1. Foul

The proposed development wastewater network is set out in the accompanying *Planning Engineering Design Report* (MHL, 2025b). The wastewater network is to be designed in accordance with Irish Water Connections and Developer Services Standard Details and Codes of Practice.

Following a Pre-Connection Enquiry, Irish Water has determined the existing Blarney Wastewater Treatment Plant has capacity to cater for proposed Ringwood development without an upgrade at this time. It notes that The COF references higher housing units' numbers than that sought for this application "*Phase 2 Ringwood*". For wastewater connection in order to service a section of the development, the provision of a waste water pumping station (WWPS) is necessary to collect and discharge wastewater loading to the existing Uisce Éireann network. Sewer upgrade to the existing network along Station Road may also be required (subject to hydraulic modelling at connection application stage). In the COF it is noted for wastewater that while there is current capacity at Blarney WWTP to facilitate the proposed connection, capacity is limited such that should any number of the proposed developments in Blarney make connection applications before that of the proposed development, capacity may be utilised by others and upgrades to the current WWTP may be required. Please refer to the appendix to MHL, 2025b (*Planning Engineering Design Report*) which shows the Irish Water Letter to the Applicants agent, confirming feasibility of connection.

(Full details of waste water system design are presented in Section 8.0 of MHL, 2025b - *Planning Engineering Design Report*).

4.1.1.2. Water Supply

The site enjoys connectivity onto existing watermains at a number of locations along its periphery. Irish Water records indicate that watermains are located along the R617 Regional Road to the south of the site, along Station Road and on the local road to the north of the northern-most, Stoneview site. For this planning application, the subject's site is proposed to tie into the existing watermain infrastructure located on Station Road.

The scheme watermain network has been outlined in Section 5.4 of the *Engineering Planning Report* (MHL, 2025b) to reference appropriate connection locations and likely infrastructure requirements. The water network is to be designed in accordance with Irish Water Connections and *Developer Services Standard Details and Codes of Practice*.

The letter from Irish Water confirms that adequate capacity is available for approximately 325 units without any plant upgrades.

Irish Water have highlighted that local network improvement works will be required to cater for the development, including approximately 450m of network upgrades. Please refer to the appendix to MHL, 2025b (*Planning Engineering Design Report*) which shows the Irish Water Letter to the Applicants agent, confirming feasibility of connection.

Full details of proposed water supply design are presented in Section 7.5 of MHL, 2025b - *Planning Engineering Design Report*).

4.1.1.3. Road / Junction Design

Full details of road / junction design are presented in Section 9.0 of MHL, 2025b - *Planning Engineering Design Report*).

4.1.1.4. Gas, Electricity & Communications

The N20 Limerick Road has existing service infrastructure in the form of electric power supply, telecommunications via Eircom and gas supply from Gas Network Ireland. These services are detailed in the service layouts supplied in the Appendices of the *Planning Design Engineer Report* (MHL, 2025b).

An extensive gas network is located in the immediate vicinity of the site.

An existing gas line runs past the east of the site. This line a 180PE-X 4bar line. To the eastern side of the N20 a GNI transmission line 150mm ST 70bar is noted.

An extensive telecommunication/broadband network is also located in the immediate vicinity of the site. ESB Network Demand Capacity is available at the site (see section 5.5 of MHL, 2025b - *Planning Engineering Design Report*).

4.1.1.5. Lighting

Existing public lighting and pedestrian connectivity is available at the proposed junction with the Station Road and the R617. The site is serviced by public footpaths along the nearside of the property boundary with the local road, which provides pedestrian connectivity to the surrounding area and access to the service station convenience store.

The proposed public lighting for the new development has been designed using '*Lighting Reality Public Lighting Reality*' software. This lighting design software provides lighting compliant designs to EN13201:2015. The design is a residential estate comprising of housing units and apartments.The ecological sensitivity of the site for bats was also considered as part of the design.

Full details of lighting design are presented in Section 10.0 of MHL, 2025b - *Planning Engineering Design Report*).

4.1.1.6. Proposed Surface Water Management System

The proposed surface water network for Phase 2 has been split into four catchments, 1a, 1b, 1c and 1d, see Figure 7.2 of MHL, 2025b (*Planning Engineering Design Report*); which align with the sub-catchment and storm water routes proposed for the granted Phase 1 development. The catchments will operate independently with the controlled discharges from each discharging via two outfalls to the adjoining watercourses.

To manage runoff effectively through attenuation methods, a hydraulic control is necessary to limit downstream flow magnitude. This is complemented by upstream infiltration and storage capacity to retain the volume of runoff regulated by the hydraulic control. The proposed approach involves the use of nature-based surface water measures with supplemental storage detention devices, equipped with a restricted outlet as the control devices. The design of the required storage volume has been meticulously calculated using UKSUDS and Flow software. Please refer to Proposed Surface Water Drainage layouts for the site in Planning Drawing Pack accompanying this planning application. As part of the design process the *Nature-based Solutions to the Management of Rainwater and Surface Water Runoff in Urban Areas - Water Sensitive Urban Design Best Practice Interim* Guidance Document prepared by the Department of Housing and the "*Interim Code of Practice for Sustainable Drainage System*" published in July 2004 by the National SUDS Working Group was consulted.

The surface water drainage network for the proposed development underwent modelling, incorporating details such as above ground flows, green basins, swales and supporting surface water engineered solutions. These engineered solutions include pipe lengths, slopes, contributing impermeable areas, upstream invert levels, upstream cover levels, and pipe diameters.

The proposed surface water networks will include a storm drainage pipe network and SuDS features, including nature-based features, which will aid the reduction of runoff volumes by slowing surface water flows, both providing the opportunity for evapotranspiration and rainwater storage.

The SuDS strategy for the development involves a combination of measures such as swales, tree-pits, and basins. Together, these elements provide conveyance, interception storage, and attenuation storage for rainwater runoff.

To manage rainwater runoff from the houses, a specific approach is proposed. Runoff from the front roof will discharge to permeable paving located at the front of the house, while runoff from the back roof will discharge to soakaways. This strategy ensures effective management of rainwater runoff from the residential properties.



Figure 4-2 Phase 2 Proposed Stormwater Drainage Network (MHL, 2025b).

The design of the drainage network was assessed using events with a range of different durations to determine the critical event for each period analysed as follows:

- 1 in 2-year return period events were used to ensure that the system did not surcharge.
- 1 in 100-year return period was used to ensure that flooding did not occur

The new drainage system provided for the proposed development will be entirely separated from the wastewater sewer network.

The existing 300mm to 500mm OD storm sewer is to be rerouted within the development road carriageways, as per Figure 4-3. This new storm is to reconnect with the existing wayleave sewer (500mm OD) to the south of the development access (within the site).

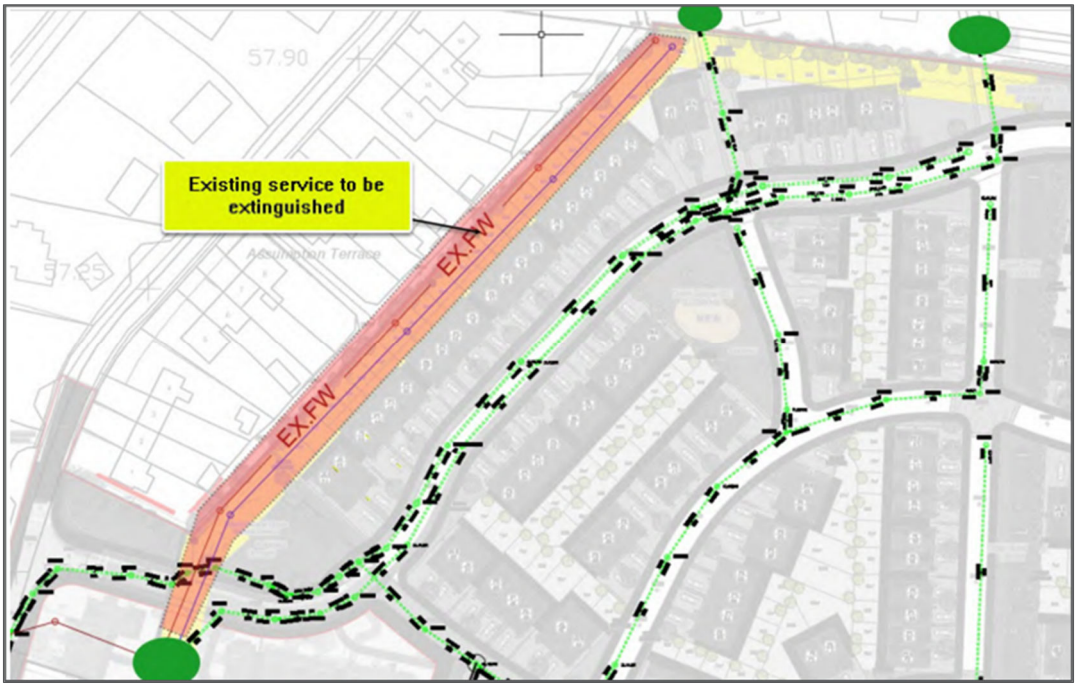


Figure 4-3 Phase 2 Proposed Stormwater Network (MHL, 2025b).

The layout of the proposed storm water network is shown in the Proposed Stormwater Sewer layout plans. For further details on these surface water and SUDS proposals, please refer to the supporting Drainage Impact Assessment report, as submitted.

4.1.1.7. Hydrocarbon Treatment

In construction, a petrol interceptor serves as a crucial trap designed to filter out hydrocarbon pollutants from rainwater runoff, preventing fuel contamination of streams that carry away the runoff.

The functioning principle of petrol interceptors relies on the fact that certain hydrocarbons, such as petroleum and diesel, tend to float on water. When rainwater runoff, potentially carrying contaminants, flows off roads or hardstanding areas, it enters the interceptor, typically deposited into the first tank.

The initial tank accumulates a layer of hydrocarbons and other scum. Typically, petrol interceptors consist of three separate tanks, each interconnected with a dip pipe. As more liquid enters the interceptor, water moves into the second tank, leaving the majority of hydrocarbons behind because they cannot enter the dip pipe. The dip pipe's opening into the second tank is positioned below the surface.

While some contaminants may inadvertently enter the second tank, it does not accumulate as much hydrocarbon on its surface. Similarly, as water continues to enter the second tank, it is then pushed into the third tank.

The third tank is designed to be clear of any floating hydrocarbons on its surface. As an additional precaution, the outlet pipe also functions as a dip pipe. When water exits the third tank through the outlet pipe, it should be free of contaminants.

In this project (Phase 2) there are 4 no. different catchment areas that eventually discharge to the public stormwater network/existing watercourses from the development. Each local network will have a petrol interceptor incorporated into the system to reduce the risk of pollutants[1]. Conder interceptors with an acceptable catchment capacity will be provided in each catchment area. A summary of the proposed interceptors is as per the *Drainage Impact Assessment* (see MHL, 2025c).

4.1.1.8. Silt Control

The proposed bypass interceptors from Conder Environmental also include a silt storage capacity in addition to the oil storage capacity that allow silt to be collected in the interceptor prior to discharge to the proposed attenuation tanks. This silt build up can then be removed from the tanks. The amount of silt storage from the proposed bypass interceptor is outlined below.

The design of individual soakaways and attenuation tank systems have too been considered. It is thought that the site would be served by providing attenuation basins/tanking to deal with the internal road impervious area surface runoff.

Each storm run will pass through a hydrocarbon bypass interceptor, an attenuation tank, and flow control manhole before out falling into the existing storm network/ watercourses. Design details and images of attenuation tanks are presented in Figure 3.6 and 3.7 of MHL, 2025c - *Drainage Impact Assessment*.

There is no existing foul water network within the wider extents of proposed development site, except for an existing service wayleave running along the western boundary of the applicant's site with the neighbouring Assumption Terrace. There is an existing 225mm diameter public foul sewer in the Station Road to the west of the site. This existing sewer runs in a north- south direction eventually discharging to the Wastewater Pumping Station in Blarney. Wastewater collection within the proposed development will be primarily via a network of 150mm, 225mm 300mm and 375mm diameter gravity sewers, which will direct the flows in two directions, to the western boundary of the site and will connect directly to the foul sewer in Station Road and to the southern boundary at the new development entrance with the R617.

For eastward surface/storm flows, an outfall to Shean Upper Stream is proposed within Phase 1 of the Ringwood LRD; Phase 2 surface water and stormwater flows to the east will utilise this system (being constructed under Phase 1), described below.

[1] The hard surfaced area that will be draining to the interceptor from Catchment Areas No.1a is circa 6730m^2, the hard surfaced area that will be draining to the interceptor from Catchment Area No.1b is circa 9,271m^2, the hard surfaced area that will be draining to the interceptor from Catchment Area No.1c is circa 5,419m^2 and the hard surfaced area that will be draining to the interceptor from Catchment Area No.1d is circa 16,017m^2.

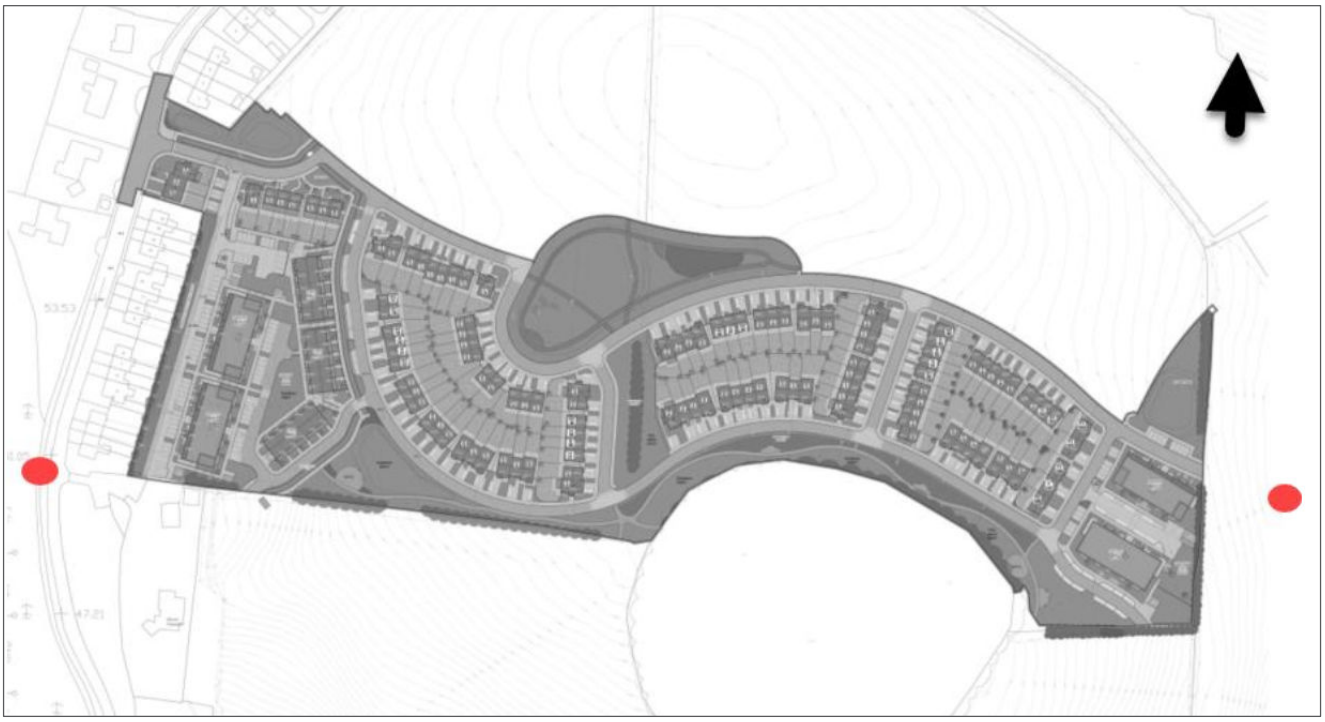


Figure 4-4 Proposed outfall locations (MHL, 2025c) (shown on image of Phase 1 development).

A headwall will be constructed at the outfall to Shean Upper Stream in line with TII Standards – RCD/500/53 (Formed Headwalls for 150-1800 diameter pipes). This will not be constructed on the riverbank, so no instream or riverbank works are required. It will instead form part of SuDS measures to be constructed.

The surface water strategy also employs a series of nature based Sustainable Urban Drainage tools ensuring that the development will: -

- Manage and control runoff volumes and flow rates from impermeable surfaces, reducing the impact of urbanisation on flooding.
- Provide opportunities harvesting rainwater run for use close to where it falls.
- Promote groundwater and aquifer body recharge.
- Protect natural flow regimes in watercourses.
- Encourage evapotranspiration from planted and other storage area.

The nature based Sustainable Urban Drainage tools employed as part of this scheme are to include: -

- Tree Pits - capture rainwater and lower street and building temperatures by providing shade. They also add value to biodiversity and public amenity in development areas.
- Detention Basins and Swales – these store and treat surface water run off while encouraging biodiversity and adding public amenity value. The swales will be a shallow landscaped depression at the surface with a drainage layer beneath and will be utilised to convey surface water flows.

4.1.1.9. Interception Storage

On the proposed site, it is intended to prevent the first 5mm of rainfall generated from road/footpaths from reaching the public sewers. This is achieved by providing interception storage. It is proposed to provide this by using a stone filled infiltration under the attenuation tank. It has been assumed that where the rainfall falls on green areas there will be no runoff occurring for the first 5mm - 10mm.

Permeable paving is proposed for private parking spaces at dwellings, covering a total area of circa 8000m². The drainage pipe within the stone bed for these areas will be set 100mm above the bed formation giving (assumed 35% voids) an interception storage volume of approximately 280m³. It should be noted that this volume is discounted from the overall interception storage for the development as per Cork City Council recommendations (due to ongoing maintenance concerns).

Swales and detention basins are proposed throughout the development, for a total area of 5667m². The drainage pipe within the gravel bed for these areas will be set at 100mm above the bed formation providing (assumed 30% voids) an interception storage of approximately 170m³.

Tree pits will provide infiltration with an overflow system to collect and convey runoff from extreme storm events to the swales/pipework/detention basins and detention basins. Tree pits will mostly be located adjacent to roads and will provide infiltration of rainwater runoff from these roads. The drainage pipe within the gravel bed for the tree pits will be set at 100mm above the bed formation providing (assumed 30% voids) an interception storage of approximately 6.2m³ will be achieved assuming a 5m2 area for each of the 41 tree pits.

The overall interception storage volume provided is therefore 191.2³ which is greater than the required minimum provision as detailed in Table 3.10 – Interception Volume of MHL, 2025c -*Drainage Impact Assessment*.

Furthermore, flow controls will be provided at 4 no. locations. Hydrobrake vortex control to provide control flow to match greenfield runoff rates per defined unit area are provided for and are detailed in Figure 3.11 of MHL, 2025c -*Drainage Impact Assessment*.

4.1.2. Sustainable Urban Drainage (SuDS)

The proposed surface water drainage network is designed in accordance with Sustainable Urban Drainage Systems (SUDS) principles. Surface water is a valuable resource, and it is intended to incorporate various nature-based SUDS systems in the scheme, particularly within the various amenity areas. Appropriate nature-based SUDS tools will be employed to enhance biodiversity, beauty, tranquillity and the natural aesthetic of buildings, places and landscapes and it can help make them more resilient to the changing climate.

This SUDS approach involves slowing down and reducing the quantity of surface water runoff from a developed area to manage downstream flood risk and reducing the risk of that runoff causing pollution. This is achieved by harvesting, infiltrating, slowing, storing, conveying, and treating runoff on site and, where possible, on the surface rather than underground.

By adopting this approach, it is intended to deliver and enhance the green space within the development and link to wider green networks, supporting the provision of habitats and places for wildlife to live and flourish, aligning with the wider design ambitions. The applicant has undertaken extensive geotechnical site investigations on the Ringwood site to inform the appropriate nature-based SuDS approach.

The proposed surface water management system for the proposed development has been designed in accordance with the principles of Sustainable Drainage Systems (SuDS). Further enhancing the site's sustainable urban drainage system (SuDS), the proposed development includes permeable paving for driveways and parking bays. This choice promotes increased water infiltration, reducing surface runoff and aiding in groundwater recharge. Additionally, the incorporation of rain harvesting systems, including rain butts, underscores a commitment to water conservation. These systems capture and store rainwater for later use, contributing to both sustainable water management and the overall eco-friendly design of the site. By seamlessly integrating permeable paving and rain harvesting solutions, the project not only addresses stormwater concerns but also aligns with environmentally responsible practices, fostering a more resilient and resource-conscious urban environment.

Surface water will attenuate to a new wetland and attenuation tanks, which provide greater capacity than the equivalent 100-year return period storm event. The attenuation outflows will be fitted with flow control devices which will limit discharge to the pre-development greenfield runoff rate.

The SuDS strategy includes a combination of measures such as the new wetland, tree pits, basins, permeable paving to the front of houses, and soakaways to the rear. In addition to the natural filtering which will be provided by these measures, each surface water catchment on site will be fitted with a hydrocarbon interceptor to remove contaminants and silt from the surface water before discharging from the site.

Interception storage in the form of tree pits and green roofs is also included in the proposed drainage design.

Chapter 4.0 of MHL, 2025c -*Drainage Impact Assessment* should be read in conjunction with this AA Screening report.

- Section 4.1 SuDS Objectives
- Section 4.2 SuDS Techniques

These set out in full the SuDS measures to be adopted as part of this scheme.

The following SuDS features have been identified as applicable and will be provided within the proposed scheme:

- Permeable Paving: Permeable paving is designed to allow rainwater to infiltrate through the surface, either into underlying layers or underground storage and provide attenuation of rainfall, and potentially can also store runoff from surrounding areas, if designed and sized appropriately. It is proposed that each house will be provided with a permeable paved driveway, of average area of 25m2. The storm water from the roofed areas within each property shall be collected by rain harvesting/water butts and discharged to a soakaway via distribution connection.

- Tree Pits: Tree pits will be used where feasible. Circa 41no. tree pits will be used across the development to provide interception storage and will contain engineered soil-filled tree boxes with drainage pipes beneath.

- Swales: Swales will run alongside road edges where practical and will receive runoff from the development's roads and footpaths. The swales will be a shallow landscaped depression at the surface with a drainage layer beneath and will be utilised to convey surface water flows.

- Green Roofs (where noted): Green roofs can be used to intercept rainfall, which is slowed as it flows through the vegetation and a drainage layer. Some of the rainwater is stored in the drainage layer and taken up by the vegetation, with the remainder discharged from the roof by a conventional drainage system. Flow rates from the green roof are therefore reduced and attenuated, providing source control and interception.

- Basins: basins can be used to manage the volume of runoff expected from the development and provide long-term stormwater storage. The size of the basins will be minimised with the implementation of the SuDS measures previously discussed upstream of them.

- Concrete Attenuation Tanks: will be required to manage the volume of runoff expected as previously noted.

4.1.2.1. Operation and Maintenance

To uphold the intended performance standards, it's essential to conduct regular inspections and maintenance of all proposed Sustainable Drainage Systems (SuDS)areas. Following the guidelines outlined in CIRIA C753, a "passive maintenance" strategy will be adopted, integrating many SuDS maintenance tasks into typical site management practices. This approach encompasses a range of routine, periodic, and corrective maintenance measures to ensure the effective functioning of the SuDS system.

The site management plan must incorporate regular removal of litter from all applicable Sustainable Drainage Systems (SuDS) features, including permeable paving, swales, and basins. Grass maintenance is also crucial for all SuDS components. Typically, grass within swales should be maintained between 75-150 mm in length, with longer lengths unlikely to affect functionality. It's essential to remove grass clippings from swales and dispose of them properly. For detention basins, grass cover should be kept between 35- 50mm in length, with cuttings left in place. Proper management of SuDS vegetation green waste should be integrated into regular site green waste protocols.

Regular inspections of the inlets and outlets of SuDS features are necessary to identify and remove any silt or debris build-up. These inspections should occur periodically. Additionally, to ensure accessibility for maintenance

purposes, inlets and outlets should be strimmed approximately 1.0m all around. Control chambers should undergo annual inspections, and any accumulated silt should be removed as necessary during these inspections.

Annual inspections of swales and basins are recommended to assess for silt accumulation. If any build-up is identified, it should be promptly removed. Silt removed from the site can undergo dewatering and then be applied to land outside the SuDS component profile. This ensures the continued effectiveness and functionality of the SuDS features while managing silt in an environmentally responsible manner.

Permeable paving should be swept, and a suction brush should be used when ponding occurs, which is likely at 10–15-year intervals.

The green roof designated for identified apartment blocks should undergo maintenance tailored to the vegetation utilized. Given its extensive nature, biannual or annual visits are necessary to ensure its upkeep. These visits will involve removing litter, inspecting fire breaks and drains, and eliminating any invasive plant species. Maintenance during the establishment stage, typically lasting 12 to 15 months, will be the responsibility of the green roof provider. This comprehensive maintenance regimen ensures the continued functionality and aesthetic appeal of the green roof.

The proposed Sustainable Drainage Systems (SuDS) system is designed to require low maintenance, as many of the listed actions are part of standard site upkeep and are necessary regardless. Regular inspections should be conducted to detect any damage or operational issues with the SuDS system. Access to outfalls can be facilitated through the biodiversity area, and planting has not been implemented over the two outfall areas to ensure ongoing access for maintenance or repairs. In case of the need for cleaning or other interventions, appropriate all-terrain machinery can be utilized in these areas to access outfalls effectively. This approach ensures that maintenance can be carried out efficiently while minimizing disruption to the surrounding environment.

Further details as follows are also provided: -

- Section 5.1 Oil/Petrol Interceptor
- Section 5.2 Rainwater Harvest Butt
- Section 5.3 Infiltration Basin / Tank

4.1.3. Flood Risk Assessment

A flood risk assessment which assesses the flood risks in the area, and which is used to assess the flood risk associated with the development was prepared by JBA Consulting in support of this application. Historic flood data indicates that there are no previous flood events within the proposed site area. The FRA for the proposed development shows that flooding in the channel in the east of the site occurs during blockage events only and may temporarily extend inundation within the proposed wetland area at this location. There is minimal risk to the development (from Chapter 15.0, Water).

4.1.4. Landscaping / Biodiversity Gain

A landscape planting scheme has been developed by Cunnane Stratton Reynolds Landscape Architecture. The proposed planting mix is as set out below. A full set of landscape drawings accompanying this planning application.

In tandem with the other construction activities being carried out on the buildings, elements of the site's landscaping plan will be progressed. The formation of landscape features will take place in parallel to the early works, utilising material excavated during the cut and fill exercise. As the site build progresses the landscape works will begin to focus on the soft landscaping aspects such as establishment of green zones and walkways, as well as planting of trees and shrubs in designated areas.

Peripheral planting will be installed during the first planting season to ensure boundary interfaces are as robust as possible upon occupation.

No herbicides will be used in the landscape preparation of the public open spaces, to minimise impact on natural drainage systems.

Landscape planting proposals for the site are as follows (from CSR, 2025a - *Landscape Design Rationale*).

	STREET TREES-NATIVE. All trees to have straight, unsupported leaders with symmetrical crowns.	**Height / girth**	**Qty.no**
Bp	Betula pendula	18-20cm gth. RB	42
Sa	Sorbus aucuparia	18-20cm gth. RB	42
Pp	Prunus padus	18-20cm gth. RB	36
	SPECIMEN ORNAMENTAL POLLINATOR TREES	**Height / girth**	**Qty.no**
Agr	Amelanchier x grandiflora 'Robin Hill'	16-18cm gth. RB	49
Mt	Malus tschonoskii	16-18cm gth. RB	49
Pc	Pyrus calleryana 'Chanticleer'	16-18cm gth. RB	42
	OPEN SPACE TREES -NATIVE -to be under-planted with bulbs & perennials	**Height / girth**	**Qty.no**
Qp	Quercus petraea	16-18cm gth. RB	30
Sa	Sorbus aucuparia	16-18cm gth. RB	20
Pa	Prunus avium	16-18cm gth. RB	30
Ag	Alnus glutinosa	16-18cm gth. RB	10
Psy	Pinus sylvestris	120-150cm, RB	10
	NATIVE HEDGEROW TREES 3m center spacing		
Bp	Betula pendula	8-10cm gth. RB	20
Qr	Quercus robur	8-10cm gth. RB	20
Ag	Alnus glutinosa	8-10cm gth. RB	20
Psy	Pinus sylvestris	8-10cm gth. RB	20
Fs	Fagus sylvatica	8-10cm gth. RB	20
Pn	Populus nigra	8-10cm gth. RB	20
	NATIVE HEDGEROW TRANSPLANT MIX 1m center spacing	**Height / girth**	**Qty.no**
Cm	Crataegus monogyna	60-90cm high, BR	64
Ps	Prunus spinosa	60-90cm high, BR	64
Vo	Viburnum opulus	60-90cm high, BR	64
Ia	Ilex aquifolium	60-90cm high, BR	64
Ca	Corylus avellana	60-90cm high, BR	64
Ee	Euonymus europeus	60-90cm high, BR	64
Rc	Rosa canina	60-90cm high, BR	64
	SHRUB AND GROUNDCOVER POLLINATOR PLANTING- plant in groups of same species ranging from min. 5-15no. @5/m2	**Size**	**Qty. %**
Ro	Rosmarinus officinalis	3L, PG	10
He	Hebe sp.	3L, PG	10
Pt	Prunus tenella	3L, PG	8
Pf	Potentilla fruticosa	3L, PG	8
Sj	Skimmia japonica	3L, PG	8
LH	Lavandula angustifolia 'Hidcote'	3L, PG	8
Sb	Stachys byzantina	3L, PG	8
Eb	Erysimum 'Bowles's Mauve'	3L, PG	8
Bd	Berberis darwinii	3L, PG	8
Be	Bergenia 'Eroica'	3L, PG	8
Sh	Sarcococca hookeriana	3L, PG	8
Ea	Elaeagnus angustifolia	3L, PG	8

	BULBS & PERENNIALS MIX- plant in drifts	**Size**
BM	Typical species will include:	
	Anemone nemorosa, Geranium robertianum, Hyacinthoides non-scripta, Muscari 'Blue Spike', Oxalis acetosella, Primula vulgaris, Viola riviniana, Colchicum sp., Crocus sp., Galanthus nivalis, Salvia sp., Anemone × hybrida, Anemone hupehensis, Aster sp., Chrysanthemum sp., Dahlia sp., Helleborus sp., Rudbeckia 'Goldstrum' Calamagrostis 'Karl Foerster', Stipa 'Ponytails'	bulbs, corms, & p9's
	IRISH WILDFLOWER CONSERVATION	**Size**
IW	Species to local origin. May include	
	Black Meddick, Centaury, Corn Marigold, Corn Poppy, Cornflower, Corncockle, Cowslip, Devil's Bit Scabious, Eyebright, Kidney Vetch, Lady's Bedstraw, Marjoram, Scented Mayweed, Ox-eye Daisy, Red Bartsia, Red Campion, Red Clover, Selfheal, Sorrel, St Johnswort, Yarrow, Yellow Rattle	Seed mix

Figure 4-5 Landscape planting mixes (CSR, 2025a).



Figure 4-6 Landscape Masterplan (CSR, 2025a).

4.2. Main Details of Site Construction

[Extracted from: - MHL (2025a) *Outline Construction Environmental Management Plan (oCEMP)*. MHL & Associated Ltd. Consulting Engineers. April 2025].

4.2.1. Construction Phasing

It is proposed that there will be several phases of construction on the client's site. The proposed order of construction of key elements is as follows, however this is subject to detailed review by the Contractors at construction stage and specifics may require adjustment once the contractor has been appointed.

- Site Setup.
- Demolitions and site clearance.
- Earthworks, including cut and fill and disposal of excess material off site.
- Construction of substructure.
- Super Structures.
- Roof and Façade finishes.
- Internal fit out.

After securing access to the site, the construction compound will be immediately established. Existing site services will be isolated, including decommissioning any existing substations in coordination with the ESB (Electricity Supply Board), and a temporary builder's power supply will be provided. The site will be secured with hoarding on all open sides and accessible approaches, following the indicated red-line boundaries on planning drawings.

A project ecologist will be appointed to approve all site clearance methodologies and works before the commencement of activities on-site.

The exact location of the construction compound will be confirmed in advance and agreed with the local authority. The construction compound, likely to be relocated during the works, will include welfare facilities (washrooms, drying rooms, canteen, and first aid areas), foul drainage, and a potable water supply. One access point for construction traffic will be provided using the existing entrances, Station Road and R617. Control measures will segregate construction traffic from external pedestrian traffic.

Parking spaces will be provided within the construction compound reserved for staff, clients, and visitors. These will be located on the east side of the site along the road edge. No road parking or queuing along Station Road immediately outside the site will be permitted under any circumstance, with all construction delivery traffic to be managed on a just in time basis to reduce possibility of queueing.

Anticipated normal working hours are Mon-Fri 07.00-19.00 and Saturday 08.00 - 16.00, subject to agreement at pre-commencement stage with the Local Authority. Any work outside standard hours requires written approval from the Local Authority.

Deliveries will be strategically planned to avoid high-volume periods. A detailed Traffic Management Plan will be developed, agreed upon, and submitted by the Contractor before commencement. Materials or items will not be placed outside the hoarding line unless otherwise agreed with the local authority.

Chapter 4.0 of the outline Construction and Environmental Management Plan (oCEMP; MHL, 2025a) sets out Construction management, including, but not limited to, details of: -

- Initial Site Activities
- Construction Compound
- Standard Working Hours
- Traffic Management and Deliveries
- Site Storage
- Liaison and Communication
- Site Security,
- Road Safety, etc.

Chapter 5.0 of the oCEMP (MHL, 2025a) clearly sets out how rolls and responsibilities on site will be addressed. This includes an Environmental Incidents / Complaints Procedure in as set out in Section 5.2.3, while Environmental Targets and Objectives are set out in Section 5.2.4.

Management of construction traffic is summarised in Chapter 6.0 of the oCEMP. Figure 6.1 of the oCEMP illustrates the *Proposed Construction Stage Haul Routes for large HGV'S* – these will use the N20, R617 and the L2784 (Station Road) on the western side of the site proposed for development. Details of construction traffic generation are included in section 6.7 of the oCEMP, while an assessment of traffic generated by the scheme is included in the EIAR.

Chapter 8.0 of the oCEMP includes proposed Environment Control Measures. This includes control measures for noise and air quality.

4.2.1.1. Topsoil Stripping

The removal of topsoil will be executed in a carefully controlled manner, strategically aligned with the proposed development staging. A percentage of the stripped topsoil will be repurposed on-site, contributing to landscaping efforts. The remaining topsoil will either find reuse on another site as a by-product, adhering to Article 27 of the EC (Waste Directive) Regulations (2011), or be appropriately disposed of at a licensed waste receiving facility, contingent upon the facility operator's approval in line with their permit or license.

To minimize the exposure of subsoil, the extent of topsoil strip, at any given time, will be confined to the immediate vicinity of active work areas. Throughout the project's duration, topsoil stockpiles will be safeguarded and strategically positioned away from areas where runoff may potentially enter existing surface water drains.

Additionally, the placement of topsoil stockpiles will be carefully planned to avoid the need for double handling.

4.2.1.2. Excavation of Subsoil

The excavation of existing subsoil layers has been kept to a minimum by aligning the design of proposed ground floor levels and external pavement levels with the natural topography of the site. Likewise, efforts have been made to minimize basement excavation within the constraints imposed by structural and functional considerations.

Disturbed subsoil layers will be promptly stabilised through actions like backfilling service trenches, constructing road capping layers, applying concrete blinding to the basement excavation, establishing building foundations, and completing landscaping. The exposure duration of subsoil layers will be minimised to mitigate the impact of weather effects.

Similar to the precautions taken for stripped topsoil, stockpiles of excavated subsoil material will be safeguarded throughout the project. Notably, these subsoil stockpiles will be located separately from topsoil stockpiles.

To address sediment-laden surface water runoff, measures will be implemented, including the protection of surface water inlets and the use of earth bunding adjacent to open drainage ditches for effective capture and treatment.

4.2.1.3. Importation of Fill

The site will necessitate the importation of fill material for road makeup. The materials brought onto the site for use as fill will consist of natural stones obtained from local quarries or substances that have received approval as by-products from the EPA, aligning with the EPA's criteria for identifying a material as a by-product under Article 27(1) of the European Communities (Waste Directive) Regulations, 2011.

There will be no large or extended holding of stockpiles for fill material on the site. At any given time, the amount of fill material present on the site will be restricted to what is required in the immediate vicinity of the active work area.

Where smaller stockpiles of fill are necessary, they will be appropriately safeguarded to prevent sediment-laden runoff from entering existing surface water drains. These stockpiles will also be strategically located to avoid the need for double handling.

4.2.1.4. Surface Water Protection Measures

Groundwater precautions will be taken prior to and during construction to ensure the protection of watercourse and groundwater against pollution. The measures would be informed by the site investigation works discusses above and also by CIRIA Report 532 'Control of Water Pollution from Construction Sites' and Environment Agency Pollution Prevention Guidelines, principally PPG6 - 'Working at Construction and Demolition Sites'.

To prevent spillages from contaminating the underlying soils, a secure bunded hardstand area will be designated for the storage of oils, fuels, paints, and other chemicals.

Refuelling and servicing of construction machinery will be conducted in a specific hardstand area, with off-site activities being pursued when on-site execution is not feasible.

A comprehensive response procedure will be established to address accidental pollution incidents, and spillage kits will be readily available. Construction staff will be well-acquainted with emergency procedures and the proper use of the equipment.

During the construction phase, the proposed monitoring measures concerning the soil and geological environment include: -

- Strict adherence to the Construction Management Plan and Construction and Environment Management Plan, outlined separately and to be strictly followed.
- Ongoing construction monitoring, involving inspections of existing ground conditions upon completion of cuts to road formation level, assessment of stability in excavations, and similar activities.
- Regular inspections of fuel/oil storage areas.
- Monitoring the cleanliness of the adjacent road network, implementation of dust suppression measures, and the provision of vehicle wheel wash facilities.
- Oversight of the contractor's stockpile management, ensuring the protection of excavated material intended for reuse as fill and safeguarding soils designated for removal from the site against contamination.

Consideration of weather conditions and seasonal variations will inform the planning of topsoil stripping and excavations, aiming to minimize soil erosion.

To prevent spillages from contaminating the surrounding water and hydrogeological environments, all oils, fuels, paints, and chemicals will be stored in a secure bunded hardstand area. Construction machinery refuelling and servicing will be conducted in a designated hardstand area or, when not feasible on-site, off-site.

Concrete batching for in situ concrete pours will occur off-site, and concrete truck wash down will be conducted off-site at an authorized concrete batching plant, ensuring full compliance with relevant planning and environmental consents.

The construction compound will feature adequate staff welfare facilities, including foul drainage and a potable water supply. Foul drainage discharge from the construction compound will be transported off-site to a licensed facility until a connection to the public foul drainage network is established. The construction compound's potable water supply will be shielded from contamination during construction activities. The contractor will secure a temporary connection from the existing water supply network along adjoining public roads in accordance with Irish water requirements.

Proposed monitoring during the construction phase for the water and hydrogeological environment includes: -

- Implementation of measures outlined in the Preliminary Construction Management Plan and Outline Construction and Environment Management Plan.
- Inspection of fuel/oil storage areas.
- Monitoring the cleanliness of the adjacent road network, implementation of dust suppression, and vehicle wheel wash facilities.
- All storm water discharge during construction will be discharged through a mobile oil filter separator system, until construction programme has reached the stage when surface water discharges can be passed through the two specified newly installed hydrocarbon interceptors. From there the runoff will be directed into surface water attenuation chamber, which in turn will discharge via a hydro-brake flow control device into the river Martin. The surface water attenuation chamber is being constructed as a sealed unit to ensure ground water cannot seep into the chamber system and that runoff from the redeveloped site can be limited to discharge through a hydrobrake unit at 2.0-litres/sec maximum.
- A method statement will be implemented for the cleaning and maintenance of the proposed storm drainage system during the operational phase. The OMS will specify that the two oil interceptors are cleaned twice yearly, and that the attenuation system is dislodged biannually. Both frequencies can be increased if site operations deem it necessary.
- The proposed storm network will be inspected following construction to ensure that no cross connection between the proposed foul system and storm network exists.
- The storm drainage system will be cleaned appropriately, oil interceptors and foul chamber will be filled with clean cold water and entire system will be inspected prior to being fully commissioned i.e., before being allowed to accept any drainage runoff and/or discharge to the existing canal/stream network.
- A licenced waste management company will be retained to maintain the oil interceptors and the attenuation tank initial chamber: as necessary (at least annually).
- Detailed silt control methods will be required for works and it is expected that a variety of methods may be required i.e., silt curtains, dewatering, silt sumps etc.

4.2.1.5. Air & Noise

Noise and Dust control measures are set out in section 9.1 and 9.2 of Chapter 9 respectively of the oCEMP (MHL, 2025a). Appendix 8-1 (accompanying the air quality chapter) set out the Dust Management Plan.

4.2.1.6. Invasive Species

No species listed on the 3rd Schedule of the Natural Habitats Regulations, S.I. 477 of 2011 were recorded on site. The oCEMP notes that prior to clearance of vegetation and works commencement in the area, a site walk through by the contractor will be undertaken to ensure no invasive plants are within the works zone. If uncovered, a treatment and removal plan will be developed by the contractor, with removal and appropriate disposal proposed to avoid further dispersal of the species i.e. an Invasive Species Management Plan will be prepared.

4.2.1.7. Waste Management

Details of *Proposals for Minimisation, Reuse and Recycling of (C&D) waste and environmental mitigation* measures are set out in Chapters 12 and 13 of the oCEMP. This provides full details of waste handling and storage on site (both hazardous and non-hazardous materials).

4.2.1.8. Summary

The outline CEMP has been submitted to show Clockstrike Ltd. commitment to Environmental Management of the proposed site. The environmental principles outlined in the Plan, should be adopted to ensure that potential environmental impacts and health and safety issues associated with the construction processes are effectively managed, minimised and / or eliminated.

This outline CEMP describes the environmental measures that are specific to the subject development, and which are to be implemented for the proposed development at Ringwood, Blarney, Cork. As noted above, this is a ‘live’ document which will be continuously updated throughout the construction stage where relevant. The roles and responsibilities of the applicant, the site manager, project manager and site workers have been described and how these controls are to be implemented. Regular updating and monitoring throughout the construction period will be required to ensure potential risks are adequately managed throughout the construction works.

5. Receiving Natural Environment

This section provides a description of the natural environment in the vicinity of the proposed works with a focus on that which is relevant to Appropriate Assessment. Full description of the receiving natural environment can be found in the Biodiversity Chapter of the EIAR accompanying this submission.

5.1. Designated Sites

5.1.1. European Sites

The proposed development site is not located within or in the immediate environs of any Natura 2000 sites. There are three Natura 2000 sites located within the environs of the site; namely Great Island Channel SAC (NPWS, 2014a), River Blackwater Cork / Waterford) SAC (NPWS, 2012) and Cork Harbour SPA (NPWS, 2014b) (see Table 5-1; Figure 5-1).

The Great Island SAC[2] (site code 001058) is located ca. 14.2km to the southeast of the site of the proposed development; around the north and west sides of the Great Island in Cork Harbour (Figure 5-1). Great Island SAC is designated for the protection of Mudflats and sandflats not covered by seawater at low tide (1140) and Atlantic salt meadows (Glauco-Puccinellietalia maritimae) (1330); neither of which habitat occurs within the site of the proposed development.

Cork Harbour SPA (site code 004030) is composed of a number of discrete areas including a number of estuaries within the broader harbour region (Figure 5-1). The closest part of the Cork Harbour SPA complex to the site is Douglas Estuary – 9.7km to the southeast; while the closest part via the River Lee is around Blackrock / Dunkettle at the mouth of the River Lee (where it enters Lough Mahon). Cork Harbour SPA[3] is designated for a range of wintering waterbirds; for breeding Common tern (*Sterna hirundo*) and Wetland & Waterbirds.

- Little Grebe (*Tachybaptus ruficollis*)
- Great Crested Grebe (*Podiceps cristatus*)
- Cormorant (*Phalacrocorax carbo*)
- Grey Heron (*Ardea cinerea*)
- Shelduck (*Tadorna tadorna*)
- Wigeon (*Mareca penelope*)
- Teal (*Anas crecca*)
- Pintail (*Anas acuta*)
- Shoveler (*Anas clypeata*)
- Red-breasted Merganser (*Mergus serrator*)
- Oystercatcher (*Haematopus ostralegus*)
- Golden Plover (*Pluvialis apricaria*)
- Grey Plover (*Pluvialis squatarola*)
- Lapwing (*Vanellus vanellus*)
- Dunlin (*Calidris alpina*)
- Black-tailed Godwit (*Limosa limosa*)

[2] https://www.npws.ie/protected-sites/sac/001058
[3] https://www.npws.ie/protected-sites/spa/004030

- Bar-tailed Godwit (*Limosa lapponica*)
- Curlew (*Numenius arquata*)
- Redshank (*Tringa totanus*)
- Black-headed Gull (*Chroicocephalus ridibundus*)
- Common Gull (*Larus canus*)
- Lesser Black-backed Gull (*Larus fuscus*)
- Common Tern (*Sterna hirundo*)

The River Blackwater (Cork / Waterford) SAC is located ca. 13.6km to the northeast of the proposed development. However, the site of the proposed development does not lie within the catchment of the River Blackwater and its tributaries. This Natura 2000 site is not therefore within the potential zone of influence of this project. There are a number of other sites in the wider environment, including sites within the catchment of the River Lee, such as the Gearagh SAC (000108) (NPWS, 2016) and the Gearagh SPA (004109) (NPWS, 2025a).

Table 5-1 - Natura 2000 sites in proximity to the site of the proposed development.

Site	Number	Distance (straight-line)
Special Area of Conservation		
Great Island Channel SAC	001058	14.2km SE (c. 26km downstream)
River Blackwater (Cork/Waterford) SAC	002170	13.6km NE
Special Protection Area		
Cork Harbour SPA	004030	9.7km SE (c. 21km downstream)

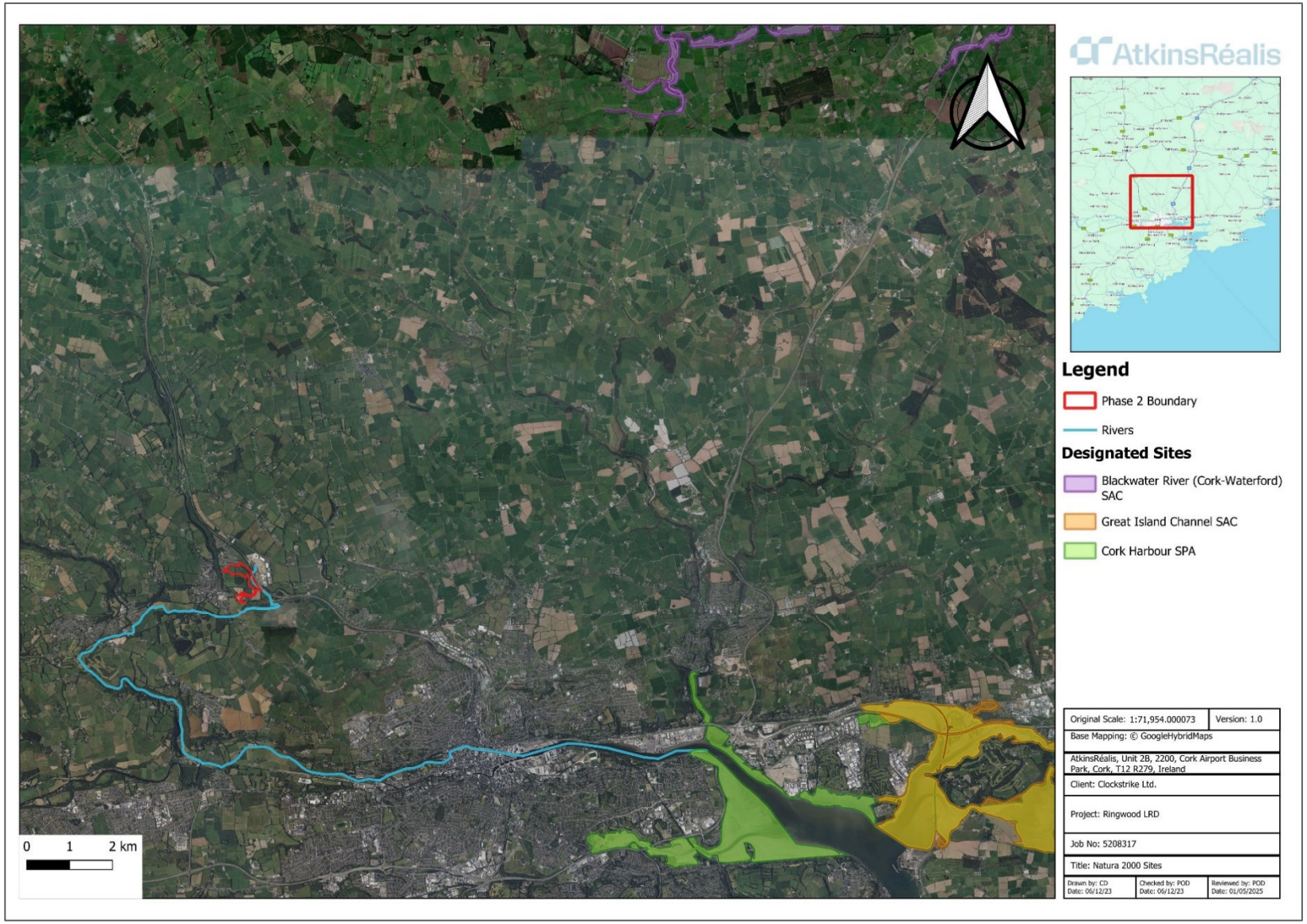


Figure 5-1 - Natura 2000 sites in environs of the site of the proposed development.

5.1.2. Nationally Designated Sites

Natural Heritage Areas (NHAs) are nationally designated sites, which are considered important for the habitat, species or geological heritage. NHAs are legally protected under the Wildlife Amendment Act 2000. Proposed Natural Heritage Areas (pNHAs) are sites that are of significance for wildlife and habitats, but which have not as yet been statutorily designated; however, their ecological value is recognised by Planning and Licencing Authorities. Sites in the environs of Ringwood LRD are discussed below (see Table 5-1) and shown on Figure 4-1. NHAs and pNHAs in the vicinity of the proposed development are further discussed within the Biodiversity Chapter of the EIAR and are presented in Figure 5-2 below.

Table 5-2 - Proposed Natural Heritage Areas close to Ringwood LRD.

Site	Number	Distance (straight-line)
Blarney Bog pNHA	001857	ca. 40m
Ardamadane Wood pNHA	001799	ca. 60m
Blarney Castle Woods pNHA	001039	ca. 700m
Blarney Lake pNHA	001798	ca. 1.2km
Shournagh Valley pNHA	000103	ca. 2.4km
Lee Valley pNHA	000094	ca. 3.2km

5.1.3. Aquatic Sites

The first order Shean Upper Stream (River Waterbody code: IE_SW_19M010600) is located within the site of the proposed development (Phase 2) to the east. The stream flows from north to south rising north of the N20 before being culverted under the N20. The stream enters Blarney Bog and Blarney Stream south of the R617 / N20 (ca. 350m southeast of the site of the proposed development). The site of the proposed development is in the Manin subcatchment (Manin_SC_010; Subcatchment_Id 19_5). To the west (ca. 120m) of the proposed development site the River Martin (also identified according to the EPA as the Manin River and Martin_040 according to the WFD) flows in a southerly direction, joining the Blarney Stream downstream of the confluence of Shean Upper Stream and Blarney Stream. The closest hydrologically connected record of water quality is Q-value records of the Blarney Stream upstream and downstream of the confluence with the Shean Upper Stream. These records date from 2023 for both the upstream and downstream site. Both sites were assigned a Q-value of 4 (Good). Meanwhile, a Q-value of 4-5 (High) was assigned to the River Martin downstream of the confluence between the Shean Upper Stream and the Blarney Stream.

All waterbodies in the vicinity of the proposed site have been assigned Moderate Status under the Water Framework Directive.

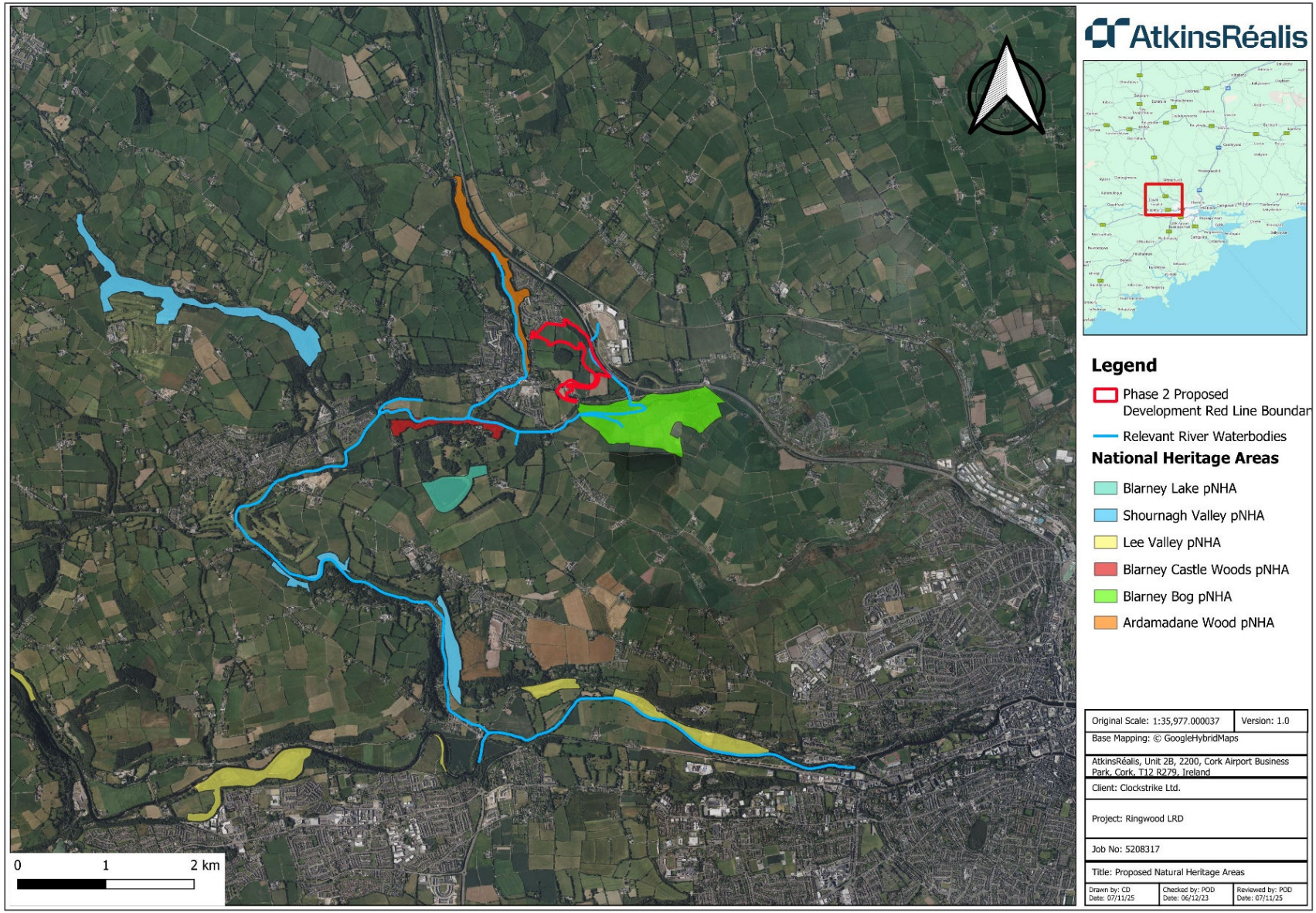


Figure 5-2 – NHA/pNHAs in the environs of Ringwood.

5.2. Habitats

Full descriptions of habitats are provided in Chapter 11 of the accompanying EIAR (Chapter 11: Biodiversity). The following is an amended description of habitats on site and any links to Annex I habitats and is informed by a 2021 Phase 1 Habitat Survey undertaken by John Deasy on behalf of AtkinsRéalis, further validated in April 2025 by AtkinsRéalis ecologists. It is noted that the site has additionally been subject to visits for various ecological surveys in 2022, 2023 and 2024; any changes in land use or habitat type would have been recorded at the time. This section can be read in conjunction with the *Green and Blue Infrastructure. Landscape Design Rationale* and Tree Survey report prepared by Cunnane Stratton Reynolds (CSR, 2025a & b), which accompany this application. See Habitat maps in Figure 5-3and Figure 5-4 below.

Table 5-3 - Habitats (as according to Fossitt) within the Ringwood site.

Habitat Code	Comment	Within Phase 2 proposed development RLB
Habitats		
BC1 – Arable crops	This habitat was recorded in a single location within the Ringwood Phase 2 site in the form of a recently cut field to the south of the site; maize was recorded planted here previously. A range of arable weed and ruderal species were recorded around. the margins of the fields including redshank, field pansy, knotgrass (*Polygonum* sp.), corn marigold, tall fescue, small canary grass, marsh cudweed and pineapple weed. This habitat is of negligible ecological value. Given the area BC1 covers within the site, it is one of the primary habitat types behind improved agricultural grassland (GA1).	Yes
GA1 – Improved agricultural grassland	The improved agricultural grassland habitat was recorded widely across the Ringwood Phase 2 site and wider Ringwood lands and consisted of species-poor, intensively managed fields some of which had been recently cut for silage. Perennial rye grass was dominant along with annual meadow grass which was recorded occasionally. White clover was frequently recorded. Broad-leaved dock, groundsel, common chickweed, curled dock, creeping buttercup and dandelion (*Taraxacum* sp.) were rarely recorded. This habitat is of negligible ecological value. This is the dominant habitat within the Ringwood Phase 2 site and the wider Ringwood lands.	Yes
GA2 – Amenity grassland (improved)	This habitat was recorded in a single area within wider Ringwood lands and is contained within a private garden at the southern end of the access road where the proposed development joins with the existing R617 road. Given the nature of this habitat as a private managed lawn it is relatively species poor and appears to be regularly mown. This habitat provides some food resources for birds and invertebrates. Therefore, this habitat is considered as being of local importance (lower value). This habitat lies within the site of the Phase 2 proposed development.	Yes
GS2 – Dry meadows and grassy verges	This habitat was recorded to the south of the Ringwood in a field that was formerly used for a golf driving range. The southern section of this habitat type lies within the Ringwood Phase 2 site. The species present included frequent common bent and sweet vernal grass. False oat grass and Yorkshire fog were recorded occasionally. Yarrow, common knapweed and cat's ear were recorded frequently. Dandelion was recorded occasionally. Common ragwort, cocksfoot,	Yes

Habitat Code	Comment	Within Phase 2 proposed development RLB
	birds foot trefoil, broad-leaved dock, common sorrel, ribwort plantain, red clover and common mouse ear were rarely recorded. The margins of the field remained uncut and indicated that the sward had recently been rank and lodged in places with coarser grass species increasing. Overall, the habitat was dominated by a small number of grass species with a small number of forbs being regularly recorded. The species present are indicative of a neutral grassland community but due to the only management evident being mowing, the habitat was classified as dry meadow and grassy verge. Due to the low species richness present, this habitat is of negligible ecological value. As noted, this habitat is located within the Ringwood Phase 2 development boundary crossed by a section of proposed access road to the R617 to the south.	
GS4 – Wet grassland	This habitat occurs within the Ringwood Phase 2 site in a small parcel to the east, close to the Shean Upper Stream and drainage ditch network present (see FW4 discussed below). Soft rush was abundant along with creeping bent grass and creeping buttercup which were frequently recorded. Yorkshire fog, lesser spearwort, sharp-flowered rush and greater birds-foot-trefoil were recorded occasionally. White clover, meadow buttercup, common sorrel and marsh thistle were rarely recorded. The sward was c. 50-60 cm high. An area adjacent had been recently mown but still held the same species. This habitat provides important food and shelter resources to birds, invertebrates and local mammal communities. Therefore, this habitat is considered as being of local importance (higher value). The area of wet grassland close to the stream lies within the Ringwood Phase 2 site proposed for development.	Yes
WS1 - Scrub	This habitat was recorded in small discrete patches around the wider Ringwood lands and Ringwood Phase 2 site. Close to the Shean Upper Stream this includes an area where mainly grey willow and birch scrub has become dense and impenetrable with bushes growing to c. 3 m, particularly around the margins of the site. Scrub habitat also contained frequent bramble and nettle as well as rosebay willowherb, sycamore, hazel, ash and alder, all of which were rarely recorded. This habitat provides some food and shelter resources to birds, invertebrates and local mammal communities. Therefore, this habitat is considered as being of local importance (higher value). Two areas of scrub habitat occur along the Ringwood Phase 2 site boundary and therefore lie within the site of the proposed development. These include a parcel along the back of residential houses along Station Road and a parcel close to the Shean Upper Stream along the east of the Ringwood Phase 2 site boundary.	Yes
WD1 – (Mixed) broadleaf woodland	This woodland habitat was recorded in the distinctive circular woodland on the hilltop (known as the Ring Wood) and also recorded adjacent to the Ringwood Phase 2 and wider Ringwood lands site boundary, as screening planting from the adjacent N20 (north-eastern side of the site). The Ringwood lies outside the proposed development site as	Yes

Habitat Code	Comment	Within Phase 2 proposed development RLB
	does most of the screening planting to the east, apart from a small strip of boundary section which lies within the boundary of the proposed development. The woodland screening the N20 consisted of a semi-mature and immature mixed woodland of beech, sycamore, ash, oak, downy birch, silver birch and hawthorn. The trees were c. 8-15 m high. This habitat provides an important linear habitat within the local area. While the habitat is frequently available in rural settings, it is becoming less common in suburban areas. This habitat provides an important ecological feature for mammals within the local environment. This habitat is of local importance (higher value) as it represents an important ecological corridor. A small strip of this screening planting lies within the Ringwood Phase 2 site between the wet woodland (see below) and N20	
WN6 (incl. WN4 & WD1) – Wet willow-alder-ash woodland including elements of Wet pedunculate oak-ash woodland and (Mixed) broadleaved woodland	This woodland is found as a linear strip along the northeastern side of the site. It is a mix of different elements of woodland, but the core of the wood (particularly along it central area where there is also a small stream) is dominated by wet willow-alder-ash woodland (WN6), with abundant alder in the centre with downy birch and ash rarely recorded. The understorey consisted of grey willow bushes along with immature ash and sycamore trees. The field layer contained frequent bramble patches along with grassy patches between which contained frequent remote sedge along with occasional creeping buttercup, creeping bent, broad buckler fern, wild angelica, ivy, marsh bedstraw, hard rush and soft rush. Bugle, lesser spearwort, yellow pimpernel and lady fern were rarely recorded. Two streams flowed through the woodland, one in a north to south direction which appears to correspond to the Shean Upper (EPA maps) and another unnamed watercourse (near dry during the site visit) that flowed downhill along the main axis of the woodland before joining with the Shean Upper on the southern side of the woodland. The eastern and south-eastern side were the most low-lying and therefore damp parts of the woodland. The elevation rose on the boundaries of the woodland and here mature oak, ash and sycamore were recorded along with Sitka spruce which was rarely recorded. The field layer around the woodland margins consisted mainly of bramble and nettle. Correspondence with Annex I Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0] has been considered. Given the origin of this woodland, and that it is not located on alluvial deposits it is not considered to correspond with this Annexed habitat. The Annex I habitat is generally well drained and periodically inundated, while the wet woodland present at the Ringwood Phase 2 site, shows signs of permanent inundation. However, this habitat is an important component of the overall hydrological regime of the site and provides a rare resource of its kind in the surrounding area and is therefore considered as being of local importance (higher value). Along the western side of the woodland there is also a narrow strip of mature oak and ash (more akin to WN4, wet pedunculate oak-ash woodland, though to the south non-native trees, such as firs, become more prominent	Yes

Habitat Code	Comment	Within Phase 2 proposed development RLB
	(WD1, (Mixed) broadleaved woodland). This woodland is discussed in greater detail below with respect to potential impacts. This habitat lies entirely within the Ringwood Phase 2 boundary proposed for development.	
ED2 / ED3 – Spoil and bare ground / Recolonising bare ground	This mosaic habitat was recorded in two areas within the Ringwood Phase 2 site, including at the site entrance off Station Road to the northwest and along a section of access track between the fields where the drainage ditch (FW4) habitat occurs and the GA1 habitat to the south. This habitat had elements of both ED2 and ED3 in those sections where regular disturbance is occurring, some spoil heaps and bare ground (ED2) is present while fringe areas were >50% dominated by recolonising herbaceous ruderals and weed plants. Species including greater plantain, pineappleweed, willowherbs and ragworts were present. This habitat provides some shelter and food source for invertebrates and birds and provides a unique habitat for flora species which may be outcompeted in other more densely vegetated habitats. Therefore, this habitat is considered as being of local importance (lower value). Both instances of this habitat recorded occur within the Ringwood Phase 2 site proposed for development.	Yes
WS1 / ED3 – Scrub / Recolonising bare ground	This mosaic habitat was recorded within a single section to the northwest of the wider Ringwood lands and Ringwood Phase 2 site close to the access point from Station Road along the back of residential houses on the edge of GA1 habitat. This habitat was dominated by herbaceous plants including a large number of willowherbs, nettles, ragwort, some trees were also scattered within this habitat (Salix spp.). Bramble and some gorse present. In 2021 this area was identified as ED3 however natural progression of vegetation has created scrub dominant habitat with fringe areas of recolonising bare ground. This habitat provides cover and some feeding opportunities for birds and invertebrates. Therefore, this habitat is considered as being of local importance (lower value). This habitat occurs within the Ringwood Phase 2 proposed development boundary.	Yes
ED3 / GS / WS1 – Recolonising bare ground / Semi-natural grassland / Scrub	This habitat was recorded around the southern margins of the maize field within the wider Ringwood lands and consisted of a mix of abundant creeping thistle as well as frequent nettle, rosebay willowherb, prickly sow thistle and creeping bent. Common ragwort, cocksfoot, bramble, Bilbao fleabane, cat's ear, Yorkshire fog, silverweed and red bartsia were recorded occasionally. False oat grass, mouse ear hawkweed, spear thistle, daisy and musk mallow were rarely recorded. This habitat provides some species diversity in an otherwise uniform landscape. Therefore, this habitat is considered as being of local importance (lower value). This habitat does not lie within the Ringwood Phase 2 site proposed for development; it occurs within the wider Ringwood lands in a single area close to the proposed access road which will provide connectivity with the R617.	Yes
Linear Habitats		

Habitat Code	Comment	Within Phase 2 proposed development RLB
BL1 – Stonewalls and other stonework	This habitat was recorded in the Ringwood Phase 2 site and wider Ringwood lands along several field boundaries and consisted of a stone and mortar wall c. 2 m high with abundant Ivy along with occasional herb Robert and navelwort. Bramble scrub often grew adjacent to the wall. A stone wall of placed boulders also occurred along the boundary between the wet woodland to the northeast and GA1 fields in the north of the site. Stone walls provide habitat and linear corridors for invertebrates and sometimes reptiles. Therefore, this habitat is considered as being of local importance (lower value). This habitat occurs within the Phase 2 proposed development boundary.	Yes
WL1 - Hedgerow	This habitat was widely recorded across the wider Ringwood lands and the Ringwood Phase 2 site in the form of field boundaries and along the margins of the old farm tracks. The habitat contained frequent hawthorn along with occasional blackthorn, holly, elder, hazel, gorse and grey willow. Mature ash and sycamore trees were occasionally recorded. Bramble was abundant along with frequent nettle, ivy, bracken and dog rose. The hedgerows were c. 4-6 m high and well developed. In addition to the semi-natural hedgerows, boundary hedges composed of non-native, ornamental species were also recorded around the boundary of the land parcels, often associated with adjacent dwellings. Cherry laurel was dominant in this habitat type, varied in height from 2-5 m high and were at various stages of development. This habitat provides an important linear habitat within the local area. While the habitat is frequently available in rural settings, it is becoming less common in suburban areas. Therefore, given the continued development in the Blarney area, this habitat is considered as being of local importance (higher value). This habitat lies within the Ringwood Phase 2 site proposed for development.	Yes
WL2 - Treeline	As with the hedgerow habitat, the treeline habitat was widely recorded across the wider Ringwood lands and the Ringwood Phase 2 site in the form of field boundaries and along the margins of the old farm tracks. Ash was abundant. Sycamore and Oak were recorded occasionally. Beech, elm, birch, Sitka spruce, Douglas fir, Scots pine was rarely recorded. Hawthorn was abundant under the treelines with occasional blackthorn, elder, crab apple and holly. Hawthorn was frequently recorded growing beneath along with frequent bramble, common hogweed, herb Robert, nettle, ivy and dog rose. Hart's tongue fern and lords and ladies were rarely recorded. The treeline habitats within the site were mature and ranged from 15-25 m high. The habitat was also recorded in the northern land where double treelines separated by c. 5 m were recorded between the former fields. These mature treelines enclose bramble dominated scrub between them. This habitat provides an important linear habitat within the local area. While the habitat is frequently available in rural settings, it is becoming less common in suburban areas.	Yes

Habitat Code	Comment	Within Phase 2 proposed development RLB
	Therefore, given the continued development in the Blarney area, this habitat is considered as being of local importance (higher value). This habitat lies within the Ringwood Phase 2 site proposed for development	
FW2 – Lowland/depositing stream	This habitat was recorded along the east within the wider Ringwood lands and Ringwood Phase 2 site. The stream is the Shean Upper (EPA maps) which rises on the eastern side of the N20; it is culverted under the N20 entering the Phase 2 Ringwood site close to the southern end of the WN6 woodland. The stream turns south before passing under the N20 slip road / R617 and entering the lake at Clogheenmilcon Fen (Blarney Bog) (designated as a proposed Natural Heritage Area). Here it joins eventually with waters from the lakes and Blarney River. To the southwest of Blarney this is joined by the River Martin. These are in turn joined by the Owennagearagh River before the combined flows become the River Shournagh, a tributary of the River Lee. During the site visits, the Shean Upper stream was c. 1.5 m wetted width and c. 5-10 cm deep with a pool riffle glide morphology. The banks of the stream have been steepened and deepened and were c. 2 m high. The instream and marginal vegetation consisted of frequent fool's-watercress as well as occasional water mint, great willowherb and nettle. The vegetation on the banks had been recently cut back but appeared to consist of frequent soft rush, wild angelica, bramble, gorse and occasional willow. The stream bed consisted mainly of cobble and gravel with lesser proportions of fine sediments. A near dry unnamed stream which was a tributary stream to the Shean Upper was also recorded in the alder dominated wet woodland. Given the hydrological linkage and linear corridor provided by the stream within the local area, this habitat is considered as being of local importance (higher value). This stream lies within the Ringwood Phase 2 site proposed for development. There is no affinity with the Annexed habitat Annex I vegetation of flowing waters [3260].	Yes
FW4 – Drainage ditch	A network of channels was located on the eastern side of the Phase 2 Ringwood site and consisted of c. 1 m deep drains which contained slow flowing or stagnant water. Some of the drains had been recently cleared of vegetation or had vegetation cut back. The remaining drains held occasional Grey willow, Gorse along with frequent Creeping buttercup, Soft rush and Fool's-watercress. Given the hydrological linkage and linear corridor provided by the drains within the local area, this habitat is considered as being of local importance (higher value). These features lie within the Ringwood Phase 2 site of the proposed development.	Yes



Plate 5-1 - BC1 habitat within proposed development site.



Plate 5-2 - GA1 habitat within proposed development site.



Plate 5-3 - WS1 habitat within wider lands at Ringwood.



Plate 5-4 - WL1 habitat within hedgerow at Ringwood.



Plate 5-5 - WL2 habitat within treeline at Ringwood.



Plate 5-6 - WD1 habitat within wider lands at Ringwood.



Plate 5-7 - WN6 mosaic habitat on the eastern boundary of the wider Ringwood lands.



Plate 5-8 - GS2 habitat south of the Ring Wood.



Plate 5-9 - GS4 habitat within wider lands at Ringwood.



Plate 5-10 - Stream (FW2) to the east of the proposed development.



Plate 5-11 - Drain (FW4) within the site of the proposed development.

5.2.1. Correspondence with Annex I habitats

Wet willow-alder-ash woodland (with elements of wet pedunculate oak-ash woodland and mixed broadleaved woodland) as recorded during habitat surveys, and its correspondence with Annex I Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0] has been considered. Given the origin of this woodland, and that it is not located on alluvial deposits it is not considered to correspond with this Annexed habitat. The Annex I habitat is generally well drained and periodically inundated, while the wet woodland present at the proposed site, shows signs of permanent inundation. According to the NPWS, the closest known example of this Annex I habitat occurs within the Lee Valley along the River Lee >12km downstream.

Annex I habitat Watercourses of plain to montane levels with Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260] is considered to occur throughout all river systems in Ireland in some capacity. This widespread distribution means there is some capacity for this habitat to occur within the River Martin to the west and as well as associated watercourses downstream of the proposed development via the Shean Upper Stream (such as the Blarney River); it is noted that during habitat surveys in 2021 and 2025, the Shean Upper Stream held no affinity with this Annex I habitat (3260) and therefore this habitat is not considered to occur within the site of the proposed development.

Blarney Bog (otherwise known as Clogeenmilcon Fen or Woods) occurs to the south of the proposed development across the R617 and is hydrologically connected to the Ringwood site via the Shean Upper Stream. Correspondence of this habitat with Annex I habitat Calcareous fens [7210] (given the underlying limestone bedrock[4] according to GSI) has been considered. This is an important area for wildlife hosting a mosaic of habitats including wet grassland, peatlands and broadleaved woodland and there is potential for elements of this Annex I habitat to be present within Blarney Bog. According to the NPWS, the closest known example of this Annex I habitat occurs c. 40km east over land; nearer examples may exist however it is not known for certain. The proposed development lies outside the boundary of Blarney Bog and aquatic ecology surveys (discussed below) demonstrates how the proposed development will have no impact upon the water quality or integrity of the Shean Upper Stream and subsequently Blarney Bog.

Annex I habitats for which the downstream Great Island Channel SAC is designated includes Mudflats and sandflats not covered by seawater at low tide [1140] and Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330]. These habitats are coastal in nature and do not occur within or in proximity to the site of the proposed development.

[4] https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0ab2fbde2aaac3c228

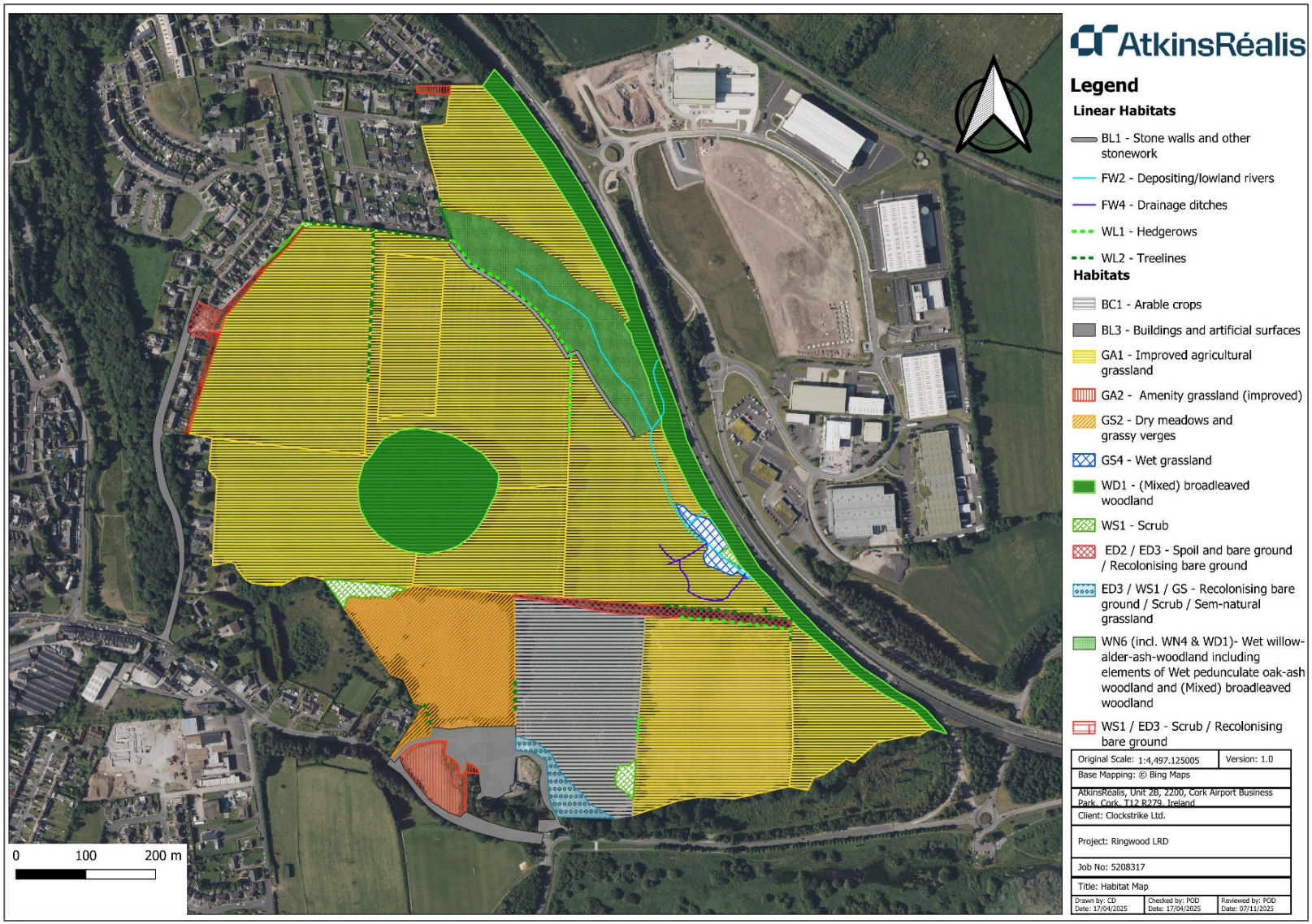


Figure 5-3 Habitat Map of lands at Ringwood.

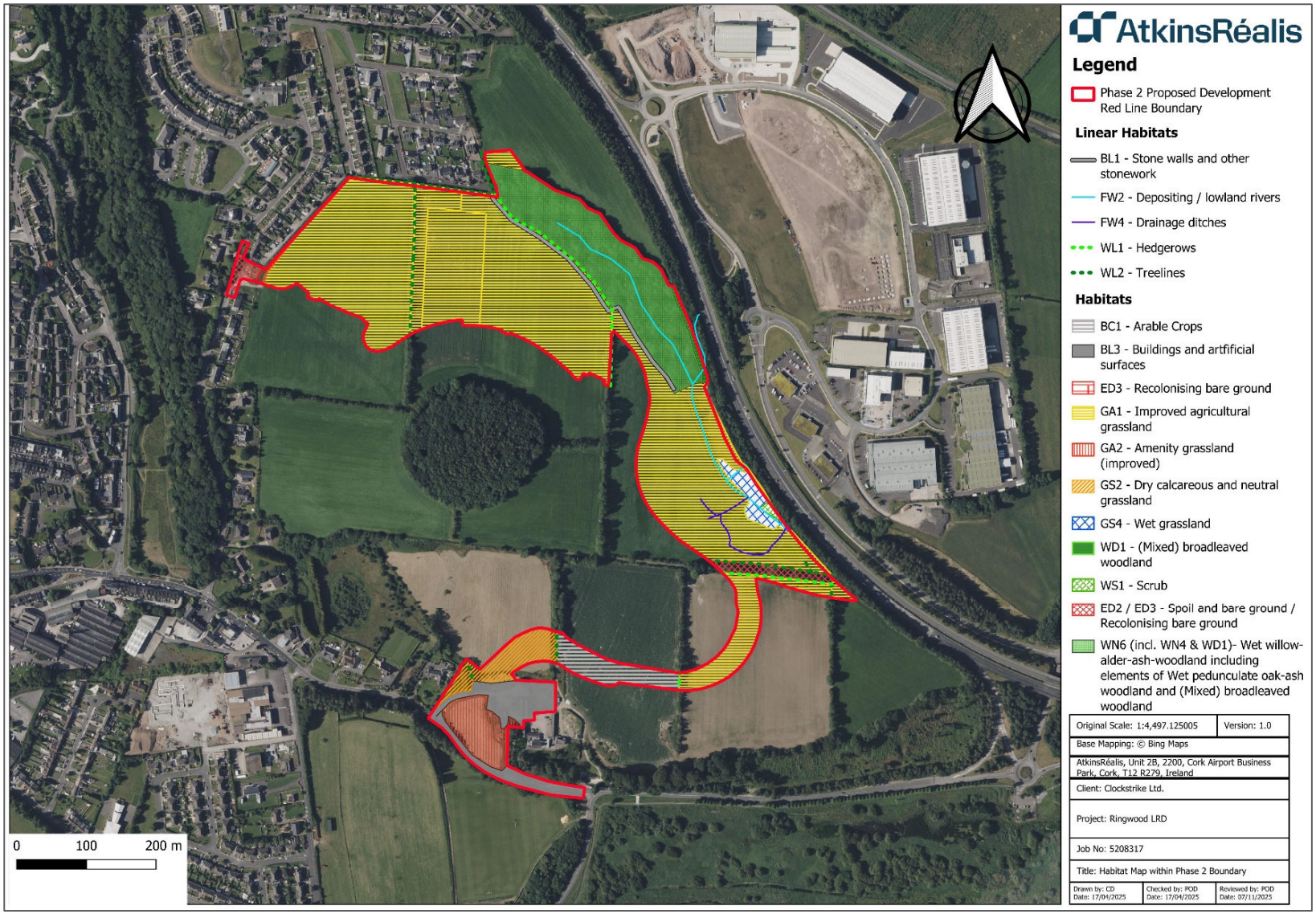


Figure 5-4 Habitat Map of habitats within the Phase 2 proposed development boundary.

5.3. Flora and Fauna

5.3.1. Protected and Rare Plant Species

The current list of plant species protected by Section 21 of the Wildlife Act 1976 is set out in the Flora Protection Order 2022 (FPO), which gives legal protection to 65 species of bryophytes and 89 species of vascular plants in Ireland. According to the NPWS Flora Protection Order Map Viewer[5], there are no protected bryophyte flora species (in accordance with the FPO) located within the bounds of the proposed site at Ringwood, however single record of protected bryophyte *Entosthodon muhlenbergii* was recorded in 1815, within what is now Woodfield residential estate.

According to a data request submitted to the NPWS there are several FPO vascular plant species and rare plant species recorded within 10km grid square W67 within which the site of the proposed development is situated; these are presented below in Table 5-4. For full details of protected status refer to Wyse-Jackson et al., 2016.

Table 5-4 - Records of Protected Flora from 10km grid square W67 (Source: NPWS data request and FPO Vascular Plant Viewer).

Species	Database	Year of Record (most recent)	Flora Protection Order, 2022	Wyse-Jackson *et al*. 2016
Meadow Saxifrage (*Saxifraga granulata*)	NPWS	1845	Yes	Regionally Extinct
Irish Spleenwort (*Asplenium onopteris*)	NPWS	2008	No	Vulnerable
Henbane (*Hyoscyamus niger*)	NPWS	1818	No	Near Threatened
Heath Cudweed (*Gnaphalium sylvaticum*)	NPWS	1844	Yes	Endangered
Weasel's-snout (*Misopates orontium*)	NPWS	1898	No	Endangered
Annual Knawel (*Scleranthus annuss*)	NPWS	1883	Yes	Vulnerable
Killarney Hawkweed (*Hieracium argentatum*)	NPWS	1905	Yes	Vulnerable
Bur Chervil (*Anthriscus caucalis*)	NPWS/NBDC	1850	No	Near Threatened
Wood Club-rush (*Scirpus sylvaticus*)	NPWS	2005	No	Near Threatened
Little-robin (*Geranium purpureum*)	NPWS/NBDC	1971	No	Endangered
Chives (*Allium schoenoprasum*)	NBDC	2012	Yes	Vulnerable

According to the NBDC, additional plant species as listed on Wyse-Jackson *et al*, 2016 Irish Red list include the Near Threatened Allseed (*Radiola linoides*) (in 2016 along the Carrigrohane Road), Corn Marigold (*Glebionis segetum*) (in 2008 within the grounds of Blarney Castle), Green Field-speedwell (*Veronica agrestis*) (in 1999 to the north close to Whitechurch), and Pale flax (*Linum bienne*) (in 2012 along Distillery Fields in Cork City). The NBDC also hold records for the Endangered Round-leaved

[5] https://dahg.maps.arcgis.com/apps/webappviewer/index.html?id=71f8df33693f48edbb70369d7fb26b7e

Crane's-bill (*Geranium rotundifolium*) (in 2023 along the Lee Fields and the River Lee within Cork City). A 1845 record for Critically Endangered moss, the Lance-leaved Pottia (*Tortula lanceola*) also occurs within the W67 hectand. Bee orchid (*Ophrys apifera*) has been recorded in 2017 to the east of the site of the proposed development in Kilbarry, greater than 5km away (over land).

No rare or protected plant species as listed above or in addition were recorded on the site during any of the site surveys.

5.3.2. Invasive Species

No invasive species listed on the 3rd Schedule of the Natural Habitats Regulations (S.I. 477 of 2011), such as Japanese knotweed, were recorded on the Ringwood Site (Phase 1-3) (or species listed on EU Regulation 1143/2014 - on the prevention and management of the introduction and spread of invasive alien species.

Invasive plant species noted, which are not listed on the 3rd Schedule of the Natural Habitats Regulations which were noted include Cherry laurel (*Prunus laurocerasus*), butterfly bush (*Buddleja davidii*), pampas grass (*Cortaderia selloana*) and Montbretia (*Crocosmia x crocosmiiflora*). Cherry laurel is categorised as a risk of high impact species (O'Flynn *et al*, 2014); while butterfly bush is a medium risk species.

In 2021, Sika deer (*Cervus nippon*) were recorded using Clogheenmilcon Fen (Blarney Bog) to the south of the Ringwood site. There were no observations of Sika deer or signs of deer from the Ringwood site.

5.3.3. Terrestrial mammals

Full desktop study and results of mammal surveys can be found within Chapter 11: Biodiversity of the accompanying EIAR. The site was also subject to a full survey for signs of terrestrial mammals. A number of animal burrows were noted on site; many of these were clearly rabbit (*Oryctolagus cuniculus*). Rabbit was found to be widespread across the site with many by burrows, droppings and sightings of live animals. Evidence of fox (*Vulpes vulpes*) was also recorded on site, along with domestic cat (*Felix catus*).

In 2021 a burrow on the southern boundary of the Ringwood land holding was identified as a potential badger (*Meles meles*) sett; this lies outside the site of the Phase 2 proposed development site. In line with best practice the exact location of the sett is not provided. During this 2021 survey, snuffle holes were also observed in agricultural grassland (GA1) adjoining the conifer woodland which abuts the Ringwood lands and a road kill badger was observed in 2022 on the N20 next to the entrance to the Blarney Business Park; this indicated that badger are present in the wider area (to the northeast of Ringwood on the eastern side of the N20). There were well worn paths leading down (to the south) from the burrow to the recently clear-felled conifer woodland which lies south of the wider Ringwood land parcel and which separates these lands from the R617 and Clogheenmilcon Fen (Blarney Bog). Given this evidence, a trail camera survey was undertaken from the 16th March to 25th March 2022; this survey confirmed the occupation of the sett by 2 no. badgers and it was deemed a likely out-lying sett. A trail camera survey was repeated in 2025 at this confirmed sett under license from the NPWS; the survey was undertaken from the 25th July 2025 to 12th September 2025. Species recorded over these 49 no. days were limited to American mink (*Neogale vision*), rabbit, fox and badger. Badger were present intermittently within the sett location throughout the entire survey period, generally for periods of 1 to 3 no. days at a time. It was concluded that 2 no. individuals were repeatedly captured with one individual an adult and the other a 'sub-adult' (young adult) given fur pattern visible (see Figure 5-5 below). Given the behaviour of the badgers utilising this sett site, the sett is classed as an out-lying sett providing the badgers a safe place to retreat to if needed when foraging. Rabbits were recorded entering the sett when not in use by badger; fox and mink were recorded passing by the sett entrance on a few isolated occasions.

The Shean Upper Stream located to the east within the Phase 2 proposed development boundary was also surveyed for signs of mammals in 2021, focusing in particular on looking for signs of otter (*Lutra lutra*) which is listed on Annex II of the EU Habitats Directive. The river corridor within the site is

characterised by good cover so the possibility of otter moving along the river corridor was considered. In 2021, no evidence such as spraints or prints were observed. A mammal burrow on raised bank in woodland adjacent to stream was recorded and mammal trails were also noted in undergrowth to the tunnel, along with signs of some fresh excavation at entrance. As a result, a trail camera was also placed at this location to find any sign of current use / occupancy by species such as otter. The camera was left in place from 16th March 2022 to 31st March 2022; this trail camera survey found evidence of fox, rabbit and brown rat only. Elsewhere drains outside the site of the proposed development are characterised by as open drains with Poor/No cover.

As with the active sett, the burrows along the Shean Upper Stream were subject to a repeat trail camera survey from 12th September to 30th September 2025. Fox was the only species to be recorded in this area, passing through the site (see Figure 5-6). There was no evidence to suggest that the foxes recorded were utilising the burrows as resting or breeding places.

According to the NPWS and NBDC databases, additional protected non-volant mammal species which have been recorded within the W67 grid square include Irish hare (*Lepus timidus* subsp. *hibernicus*), Pygmy shrew (*Sorex minutus*), Red squirrel (*Sciurus vulgaris*), Irish stoat (*Mustela erminea*), European hedgehog (*Erinaceus europaeus*), and Wood mouse (*Apodemus sylvaticus*).



Figure 5-5 - 2 no. badger (*Meles meles*) at sett entrance.



Figure 5-6 - Fox (*Vulpes vulpes*) showing vigilance at streamside burrow.

5.3.4. Birds

Due to the proximity of the site to Cork Harbour SPA and the presence of open agricultural habitats the site was surveyed for wintering birds (refer to the Chapter 11: Biodiversity of the accompanying EIAR for full discussion of birds) in November and December 2023 and in January and February 2024. Fields numbered according to bird survey areas is presented below in Figure 5-7. The site of the Phase 2 proposed development lies within fields 1, 4, 5, 6, 8, and 10.

During wintering bird surveys, only two qualifying interest species of Cork Harbour SPA were recorded utilising the fields in which the proposed development is located, Curlew (*Numenius arquata*) and Lesser black-backed gull (*Larus fuscus*). In November 2023 and February 2024, flocks of 32 no. and 31 no. Lesser black-backed gulls were recorded in fields 1 and 5 respectively. Individuals were also recorded across fields 2, 3, and 4 across these dates. A single curlew was recorded in field 3 in November 2023, with a two pairs recorded, one pair in field 9 and another pair offsite in December 2023. 8 no. curlew were recorded flying south over field 1 in January 2024.

Incidental bird sightings were recorded in August and September 2021 by John Deasy with targeted breeding bird surveys undertaken in May 2024 and repeated across April and May 2025. Survey results were divided into distance ranges of 0-25m, 25-100m, >100m and Flying Overhead however for the purpose of reporting have been included as total numbers recorded per field area.

A single Birds of Conservation Concern Ireland 2020-2026 (Gilbert *et al*, 2021) red-listed species was recorded incidentally in 2021 along the Shean Upper Stream; Grey wagtail. This record along the Shean Upper Stream lies outside the proposed development red line boundary c. 150m. Another red-listed species Redwing was recorded twice in 2024 (once in the NE wet woodland and within field 4). Snipe were flushed from field; while breeding individuals of this species are red listed, this record was for wintering individuals and therefore does not apply. In 2025 a single red-listed species was recorded; 2 no. swifts were recorded foraging within field 2 over the valley southwest of the southwest corner of the study site. Several amber-listed species were recorded in both April and May including Goldcrest, House sparrow, Linnet, Sand martin, Starling and Swallow. Sand martins were recorded to be utilising the old stone farm building in field 4.



Figure 5-7 – Field numbers corresponding with bird survey references.

5.3.5. Bats

The results of bat survey work undertaken on the site of the proposed development and in the surrounding Ringwood lands are described in full in the Biodiversity chapter of the accompanying EIAR.

Overall, the study area is considered to be of moderate to high suitability for foraging and commuting bats due to the presence of connectivity to other suitable habitats in the wider landscape. Habitats within the study area that are of potential use by foraging and commuting bats include linear features such as the Shean Upper Stream, treelines and woodland, which provide connectivity between the study area and other foraging areas in the wider landscape. Roosting opportunities at the site are limited to 5 no. trees in the field boundaries of the site to the west of the N20 that support potential roosting features such as cracks in limbs. While no potential roosting features were recorded within mature Oak trees at the edge of the northeastern woodland within the proposed development red line boundary, due to their age and size, the potential for roosting features to be present within these trees cannot be excluded.

Results from the bat surveys undertaken between October 2021and September 2025 indicate that eight species of bat, namely common pipistrelle and soprano pipistrelle (*Pipistrellus pipistrellus* and *P. pygmaeus*), Leisler's (*Nyctalus leisleri*), brown long-eared (*Plecotus auritus*), Daubenton's (*Myotis daubentoni*), Natterer's (*Myotis nattereri*), whiskered bat (*Myotis mystacinus*) and lesser horseshoe bat (*Rhinolophus hipposideros*) commute to the site and its immediate environs to forage. Of these species, common and soprano pipistrelle and Leisler's bat were recorded regularly foraging at the site. Soprano pipistrelle was recorded early in the evening (c. 14-23 minutes after sunset in Autumn 2021, Summer 2022 and Autumn 2024) at the north of the Phase 2 site, indicating the likely presence of a roost in the vicinity of the proposed site. Soprano pipistrelle social calls were also recorded at the woodland edge in October 2021 and September 2024.

Daubenton's, whiskered, Natterer's and Myotis species were recorded in lower numbers, predominantly at the edge of woodland at the north of the site. A low level of brown long-eared bat activity was recorded across the site. Two lesser horseshoe bat passes were recorded at a hedgerow to the east of Ring Wood in September 2024, no other activity from this species was recorded at the site. Of the bat species recorded in Ireland only the lesser horseshoe bat is listed on Annex II of the EU Habitats Directive. The level of activity recorded across the Phase 2 lands was variable; overall, a relatively high level of activity from a high diversity of species was recorded.

5.3.6. Aquatic Ecology

As noted, surface waters from the eastern side of the site will drain to the Shean Upper Stream which is located to the east within the proposed development boundary. The following section presents an assessment of the Shean Upper Stream and Blarney Bog pNHA to which it discharges Surface water from the western side of the site will discharge to an existing outfall to the River Martin (refer to accompanying surface water drawings and engineering report which accompany this application).

5.3.6.1. Site Survey Descriptions

Site 1 Shean Upper Stream, Blarney Business Park

Site 1 was located on the upper reaches of the Shean Upper Stream in Blarney Business Park. The small upland eroding stream (FW1) had been extensively modified historically, with much of the stream headwaters culverted underground via pipe culverts. The small stream was 1m wide and between 0.05-0.15m deep with 1-3m bank heights. It flowed over a moderate to steep gradient downstream of the road crossing (cascading glide and riffle with isolated pool). The substrata were dominated by very heavily bedded (compacted) cobble with scattered boulder and more localised gravels between coarser substrata. Siltation was high despite considerable flow rates (i.e. silt in interstitial spaces and plumes underfoot). No macrophytes were recorded present due to the high energy. However, filamentous algae cover was c. 2% despite shading and high energy supporting enrichment pressures. The stream was heavily shaded by willow-dominated woodland with abundant Chinese bramble (*Rubus tricolor*) and bramble (*Rubus fruticosus*) in the understories.



Plate 5-12 - Site 1 on the Shean Upper Stream at Blarney Business Park.

Site 2 Shean Upper Stream, at Clogheenmilcon Fen

Site 2 was located at Clogheenmilcon Nature Reserve ('Blarney Bog') immediately downstream of an extensively culverted section of the watercourse pipe. The stream was 1.5-2m wide and 0.1-0.2m deep with 0.5m high banks. The small, swift-flowing and clear water stream (FW1) had been deepened historically but exhibited good instream recovery with evident flow heterogeneity. The flow profile comprised of shallow riffle, glide and occasional deeper pool. The sandstone substrata were dominated by mixed rounded gravels with occasional cobble and small boulder. The substrata were mobile and moderately silted (silt plumes underfoot) with localised heavier depositions of silt in pool slacks. Given relatively high shading (not excessive), macrophyte cover was moderate with locally frequent fool's watercress (*Apium nodiflorum*). Reed canary grass (*Phalaris arundinacea*) dominated the riparian zones with abundant great willowherb (*Epilobium hirsutum*), nettle (*Urtica dioica*), hedge bindweed (*Calystegia sepium*), greater tussock sedge (*Carex paniculata*) and grey willow (*Salix cinerea* sp. *oleifolia*).



Plate 5-13 - Site 2 on the Shean Upper Stream at Clogheenmilcon Fen Lake.

Site 3 Blarney River, d/s Shean Upper Stream confluence

Site 3 was located on the Blarney River downstream of the Shean Upper Stream confluence. The Blarney River was a very heavily modified channel that was historically deepened and realigned. The U-shaped channel was 3-4m wide and between 1.5-2.1m deep with 0.5-2.5m high banks. The bed comprised of deep soft silt with scattered superficial gravel and cobble. The channel was heavily covered with macrophytes including frequent watercress (*Nasturtium officinale*) and fool's watercress (*Apium nodiflorum*) with localised stands of branched bur-reed (*Sparganium erectum*). Common duckweed (*Lemna minor*) was locally abundant. Green filamentous algae covered c. 5% of the riverbed bed despite depth and high turbidity in the water indicating enrichment pressures.



Plate 5-14 - Site 3 downstream of the Shean Upper Stream confluence with the Blarney River.

Clogheenmilcon Fen Lake

Clogheenmilcon Fen Lake (Blarney Bog pNHA) was a 3.15ha lake supporting a mixture of fen, marsh and reed swamp vegetation with pockets of open water. The lake was between 1m and 2m deep with moderate peat staining in the water. The open water of the lake supported abundant duckweed species including common duckweed (*Lemna minor*) and least duckweed (*Lemna minuta*). The non-native and invasive Azolla waterfern (*Azolla filiculoides*) was also present interspersed with duckweed species. The open water of the lake supported occasional common water starwort (*Callitriche stagnalis*), broad-leaved pondweed (*Potamogeton natans*) and fennel pondweed (*Stuckenia pectinata*) with abundant Canadian pondweed (*Elodea canadensis*). The shallow littorals supported watercress, fool's watercress, blue water speedwell (*Veronica anagallis-aquatica*), water mint (*Mentha aquatica*), yellow water-lily (*Nuphar lutea*) and branched bur-reed (*Sparganium erectum*). Common reed (*Phragmites australis*) and bulrush (*Typha latifolia*) were abundant in the eastern part of the basin. The exuberant macrophyte growth inclusive of floating duckweed supported evident eutrophication pressures.



Plate 5-15 - Clogheenmilcon Fen Lake (eastern basin).

5.3.6.2. Biological water quality (Q-samples)

Q-samples were collected and analysed from the *n*=3 riverine survey sites. Cumulatively a total of *n*=43 species across *n*=35 families were recorded in the riverine kick samples during September and November sampling 2023. A summary of the taxonomic composition of the surveys is presented in Appendix A. A higher total species diversity across all sites was recorded in September 2023 (*n*=37) than in November 2023 (*n*=23 species) as would be expected between summer and autumn.

The species compositions were converted into Environmental Protection Agency (EPA) Q-ratings by grouping species assemblages into water quality classes based on their known pollution sensitivities (Appendix A). Following the methodology of Toner *et al*. (2005), the Environmental Protection Agency (EPA) group invertebrates into classes whereby pollution intolerant species are denoted class A, and species with greater pollution tolerance fall into successive classes (B through E, respectively). As such, the presence or absence of these groups and their relative abundance facilitates an assessment of biological river health. Good status (Q4) unpolluted water quality is achieved according to the EPA if at least one Group A taxon is present in, at least, fair numbers (5-10% total sample composition) and Group B taxa (e.g. cased caddis) may be common or absent. The EPA group C invertebrate species, *Baetis rhodani* is often dominant at good status sites (Toner *et al*. 2005). However, other Group C taxa are never excessive and group D / E taxa are present in small numbers or absent (Toner *et. al*., 2005). Our results are discussed in the context the collective community compositions relative to their pollution tolerances.

The Q ratings remained consistent between September 2023 and November 2023 (Table 5-5, Figure 5-8 and Figure 5-9). Site 1 on the Shean Upper Stream and Site 3 on the Blarney River had an absence of EPA group A indicator species (Appendix A). They also had sample compositions dominated by EPA group C (moderate water quality indicator species including the ubiquitous mayfly, *Baetis rhodani* and caseless caddis species *Diplectrona felix*, *Philopotamus montanus* and *Wormaldia occipitalis*) (Appendix A). Therefore, the Q-Rating at Site 1 was Q3 (poor status) or equivalent EQR of 0.6 and Q2-3 at Site 3 (also of poor status) but at the lower end of the scale (i.e. EQR 0.5) (Table 5-5, Figure 5-8 and Figure 5-9).

Site 2 on the Shean Upper Stream was of moderate status (Q3-4) and thus achieved the best biological water quality of the three sites (EQR of 0.7). This was due to the presence of low numbers of EPA group A taxa that were absent from the other sampling sites and are indicative of improved water quality (Appendix A). The group A taxa were represented solely by the mayfly *Ecdyonurus dispar*, a species intolerant of enrichment and siltation pressures. Furthermore, the sample was represented by low numbers group B clean water cased caddis also present, namely *Agapetus fuscipes* and *Silo pallipes* (Appendix A) and a dominance of EPA group C taxa (i.e. moderate water quality indicators). No rare or protected invertebrate species were recorded based on a review of the compiled species list.

Table 5-5 - Summary of Q-ratings for the Shean Upper Stream and Blarney River on the 28th of September and 9th November 2023.

Site no.	Watercourse	Q-rating November 2023	Water quality status	Q-rating September 2023	Water quality status
1	Shean Upper Stream	**Q3 (EQR 0.6)**	Poor status	**Q3 (EQR 0.6)**	Poor status
2	Shean Upper Stream	**Q3-4 (EQR 0.7)**	Moderate status	**Q3-4 (EQR 0.7)**	Moderate status
3	Blarney River	**Q2-3 (EQR 0.5)**	Poor status	**Q2-3 (EQR 0.5)**	Poor status

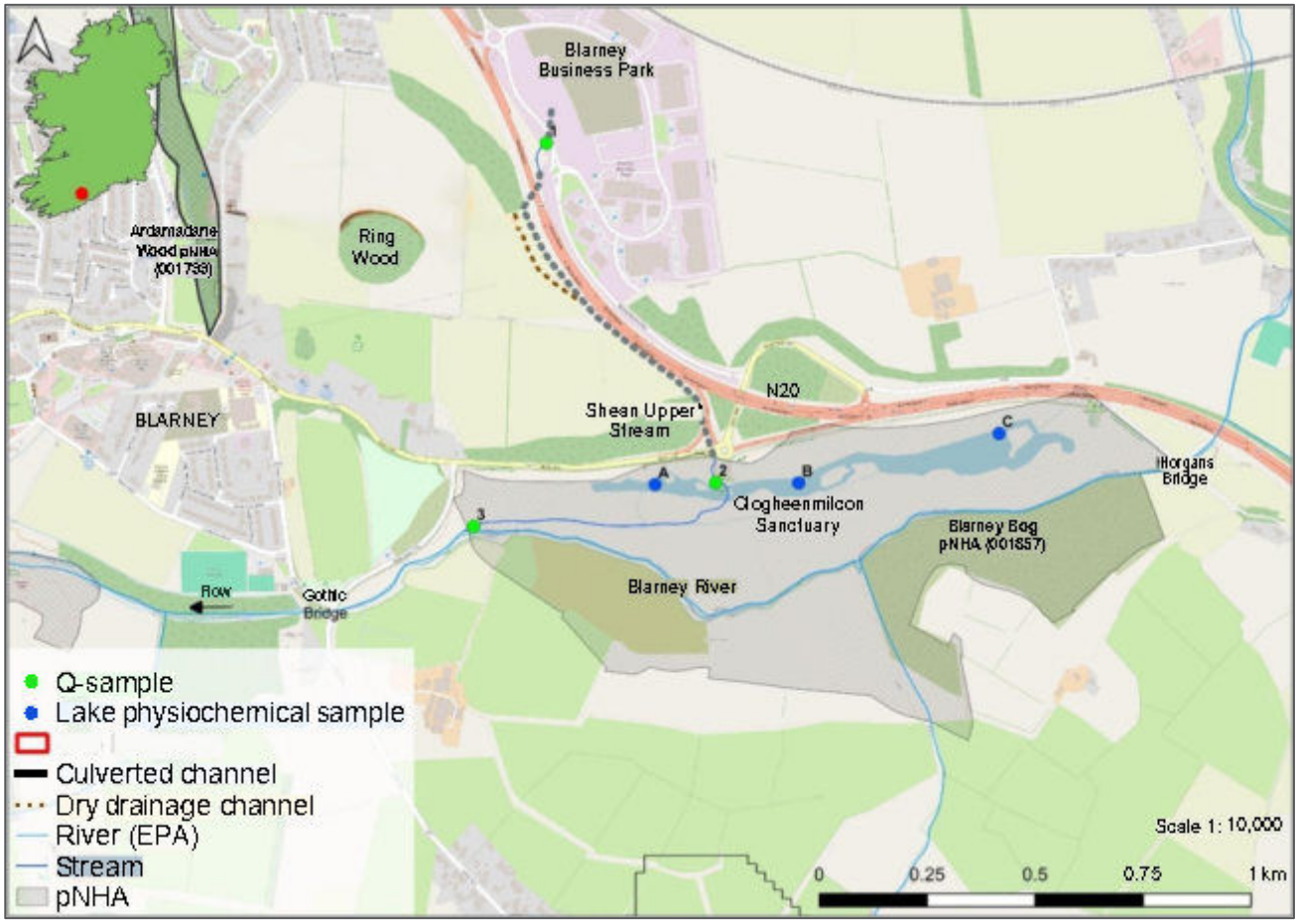


Figure 5-8 Biological water quality status of the n=3 Q sampling sites on the Shean Upper Stream & Blarney River.

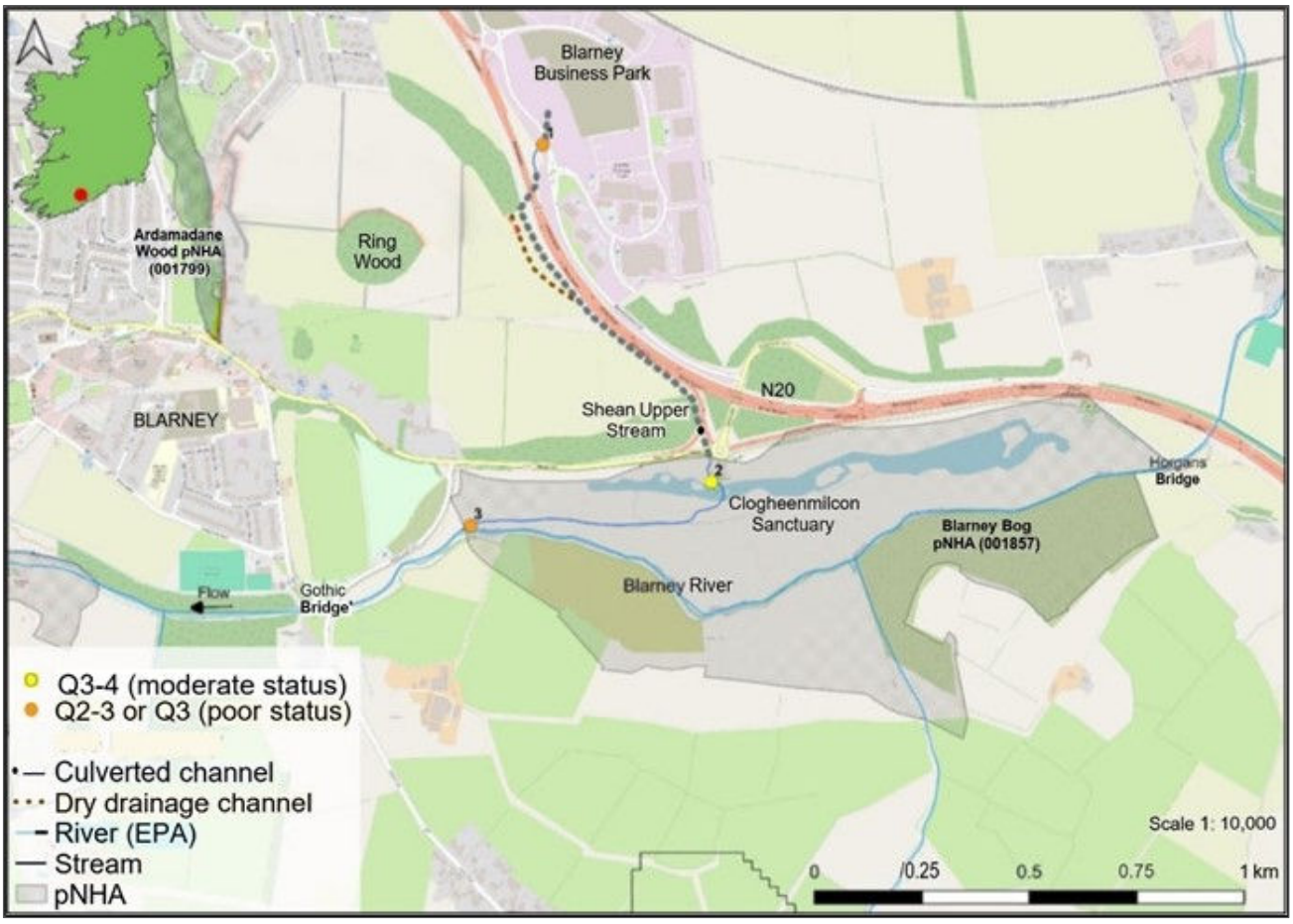


Figure 5-9 Biological water quality status of the n=3 Q sampling sites on the Shean Upper Stream & Blarney River.

5.3.6.3. Physiochemical water quality

Riverine physiochemical results

The mean physiochemical water quality results recorded at the three riverine survey sites recorded on the 28th of September and 9th November 2023 are summarised below in Table 5-6. Full laboratory physiochemical results for both sampling periods are provided in Appendix B.

The mean pH levels across the three riverine sampling sites were recorded between 7.15 to 7.70 pH units and are as expected for a river flowing over purple mudstone and sandstone geologies (i.e. moderate base influences). The pH levels also align with the alkalinity ($CaCO_3$) levels that were indicative of moderate alkalinity waters, being between 73-82mg/l $CaCO_3$ across all three riverine survey sites.

Only Site 2 on the Shean Upper Stream met the good-status targets for total ammonia (i.e. ≤0.065 mg N/l) as set out under the European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2019 (S.I. No. 77/2019). By comparison Site 1 on the Shean Upper Stream and Site 3 on the Blarney River had elevated total ammonia levels (i.e. 0.088 & 0.093 mg N/l) respectively (Table 5-6).

The European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2019 (S.I. 77 of 2019) sets no specific boundary conditions for nitrate. However, EPA assessment of high-quality water sources has set boundary conditions of 0.9 mg/l NO_3-N (nitrate as nitrogen) for high quality waters and 1.8 mg/l NO_3-N for good quality waters (EPA, 2022b). As TON is comprised mainly of nitrate (N as NO3) given that the concentration of nitrite is typically negligible (O'Boyle *et al*., 2019), the levels of nitrate as total oxidised nitrogen (TON) were elevated across all three riverine survey sites and recorded between 2.619 and 3.803 mg N/l (Table 4-7). Nitrate levels are now elevated in most rivers in Ireland with the primary contributor being agriculture.

While Sites 1 and 2 on the Shean Upper Stream had lower ortho-p than Site 3 on the Blarney River, none of the three survey sites had levels ≤0.035mg P/l as set out for good status water quality under the European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2019 (S.I. No. 77/2019) (Table 4-7). In general, the MRP levels were comparable between the September and November sampling periods but with noticeable elevations in November at Site 3 (Appendix B). Total phosphorous should be ≤0.025mg P/l for good status water quality and was also exceeded at all three sites with a significant exceedance at Site 3 (0.228mg P/l). The observed elevations in both N and P support significant eutrophication pressures.

Sites 1 and 2 sampling sites (mean values) met the high-status threshold for biochemical oxygen demand (BOD) (i.e. levels ≤1.5mg O_2/l at both sets) as set out under the European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2019 (S.I. No. 77/2019). However, Site 3 on the Blarney River failed to meet the equivalent good (≤1.5mg O_2/l) or high status (≤1.3mg O_2/l) threshold due to elevated mean levels (i.e. 1.9 mg O_2/l). Higher BOD levels are indicative of some form of pollution and reduce the dissolved oxygen available for aquatic biota. However, BOD values of ≤5mg/l were recorded at all survey locations which are considered capable to support healthy salmonid populations according to the European Communities (Quality of Salmonid Waters) Regulations (S.I. No. 293/1988). The dissolved oxygen levels were also good across sites with levels recorded between 9.65mg/l and 10.8mg/l. Levels of <7mg/l in river are sub-optimal and result in stress to aquatic biota, particularly sensitive invertebrates and salmonid populations (pers. obs.). Suspended solid levels were low across all three riverine survey sites being <5mg/l.

Table 5-6 - Mean physiochemical water quality results at riverine survey sites on the Shean Upper Stream (Sites 1 & 2) and the Blarney River (Site 3).

Parameter	Site 1	STDEV	Site 2	STDEV	Site 3	STDEV
pH	**7.70**	0.22	**7.56**	0.03	**7.15**	0.40
Alkalinity (mg CaCO3/l)	**77.00**	7.07	**82.00**	1.41	**73.00**	15.56
Conductivity @25°C (µS/cm)	**255.0**	24.04	**295**	16.97	**273.50**	60.10
Total Ammonia (mg N/l)	**0.088**	0.071	**0.035**	0.025	**0.096**	0.001
Ortho-P (mg P/l)	**0.040**	0.014	**0.039**	0.004	**0.123**	0.110
Total P (mg P/l)	**0.062**	0.021	**0.053**	0.014	**0.228**	0.214
Total Oxidised Nitrogen (mg N/l)	**2.62**	0.49	**3.91**	0.62	**3.80**	2.27
BOD (mg O2/l)	**0.75**	0.07	**0.65**	0.07	**1.90**	1.56
Suspended Solids (mg/l)	**4.60**	1.98	**3.35**	0.21	**4.40**	1.27
Dissolved oxygen (mg/l)	**9.65**	0.78	**10.80**	10.45	**10.10**	10.00

Lake physiochemical results

Composite physiochemical water quality samples were collected from Clogheenmilcon Fen Lake from the western (Site A), central (Site B) and eastern basin (Site C). The results are summarised as mean values between the three sampling areas for the September and November sampling periods (Table 5-7).

The pH levels were circum-neutral (7.00 & 7.21, respectively) and lower than expected for a higher alkalinity lake (i.e. 86.33 & 92.67 mg $CaCO_3$/l for September and November respectively). The pH may be lower because of humic peat influences in the basin. The higher alkalinity by contrast likely reflects the Waulsortian Limestones and Shales that underly the lake basin (GSI data).

With regards nutrients, levels of total phosphorus were very high with recorded means at 0.13 and 0.22mg P/l respectively for September and November 2023 (Table 5-7).Therefore, the lake failed considerably to achieve good status as required in the European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2019 (S.I. 77/2019) (i.e., good status is ≤0.025mg P/l).

The chlorophyll a concentration at the time of sampling during September and November 2023 were 10.87 & 4.41µg/l respectively, thus indicating upper mesotrophic conditions overall (8-25µg/l; according to OECD, 1982).

However, it should be noted that lake trophic status is only reliably calculated from annual maximum values of chlorophyll a, total phosphorus and water transparency (Secchi disc depth) across ≥10 samples during months with the greatest planktonic growth (O'Boyle *et al.*, 2019).

According to the EPA there are currently no environmental quality standards for nitrate, however, average nitrate concentration values less than 4 mg/l NO_3 (0.9 mg/l N) are considered by the EPA to be indicative of good quality water (EPA, 2022b). The recorded levels are therefore indicative of eutrophic conditions with levels recorded at 4.2 and 4.83 mg N/l respectively (Table 5-7).

Table 5-7 - Mean physiochemical water quality results on the 28th of September 2023 & 9th November 2023 at Clogheenmilcon Fen Lake for composite samples A, B and C.

Parameter	28th September 2023		9th November 2023	
	Mean	STDEV	Mean	STDEV
pH	**7.00**	0.13	**7.21**	0.27
Alkalinity (mg CaCO3/l)	**86.33**	11.55	**92.67**	8.39
Conductivity @25°C (µS/cm)	**319.67**	40.62	**336.33**	33.31
Total Ammonia (mg N/l)	**0.16**	0.12	**0.09**	0.07
Ortho-P (mg P/l)	**0.12**	0.08	**0.06**	0.03
Total P (mg P/l)	**0.22**	0.13	**0.13**	0.02
Total Oxidised Nitrogen (mg N/l)	**4.20**	2.28	**4.83**	0.47
Chlorophyll a (µg/l)	**10.87**	3.64	**4.41**	3.36
Suspended Solids (mg/l)	**5.50**	2.78	**15.50**	22.95
Dissolved Oxygen (mg/l)	**7.93**	0.76	**8.53**	0.60

5.3.6.4. Summary of Water Quality Data

Summary of Biological Water Quality

The biological water quality collected at the three survey sites on the Shean Upper Stream and the Blarney River collected over two time periods on the 28th September and 9th November 2023 failed to attain target 'good status' water quality (≥Q4; EQR ≥0.8) as required under the Water Framework Directive (2000/60/EC). Water quality on the Shean Upper Stream at the Blarney Business Park was of poor status (**Q3**) but improved near the confluence point of the stream with Clogheenmilcon Fen Lake. At this location moderate status (**Q3-4**) biological water quality was recorded. The poor water quality in the upper catchment at the Blarney Business Park can be attributed to storm drain pollution that is a known threat to water quality in the sub-catchment (EPA, 2023). Evident storm drain inputs were visible in this area from the site visit where discoloured water was observed entering the stream. A single biological water quality sample was collected on the Blarney River at Site 3 downstream of its confluence with the Shean Upper Stream. Poor status (**Q2-3**) water quality was recorded at this site which had the worst water quality of all three riverine survey sites. However, the recorded Q rating was tentative given the absence of suitable riffle and or shallow glide habitat. Nonetheless, hydromorphological impacts, i.e. straightening and deepening of the channel as part of historical drainage works had impacted the rivers natural flow regimes. Furthermore, significant pollution impact potential (PIP's) from diffuse phosphorus at pastures south of Clogheenmilcon Fen have been identified by the EPA. Collectively these pressures have placed the Martin_040 sub-catchment 'at risk' of not meeting the 2027 WFD targets. Unfortunately, rivers suffering from water quality decline are also at risk of losing the rarest invertebrate species that are strongly associated with natural river channel form with associated good or high status water quality. In the current survey no rare invertebrate species (Feeley *et al*. 2020a; Kelly-Quinn *et al*. 2012; Foster *et al*, 2009) were recorded in the Q samples collected which may be consequential of the observed poor water quality and associated hydromorphological pressures.

Summary of Physiochemical Water Quality

The riverine physiochemical water quality results largely aligned with the Q sampling results in identifying pollution pressures. Site 1 on the Shean Upper Stream and Site 3 on the Blarney River had the poorest physiochemical

water quality with observed spikes in total ammonia and total phosphorus. All three survey areas also had elevations in nitrates and phosphate that did not align with good status water quality targets. The most significant eutrophication pressures were observed at Site 3 on the Blarney River. Overall, the physiochemical results would support the pollution impact potential (PIP's) documented by the EPA in their surveillance monitoring from diffuse phosphates and nitrates in the Martin_040 catchment. These pressures are associated with diffuse agricultural sources associated with intensively managed pastures in addition to free draining soils where nutrient loss is highest.

5.4. Air Quality Assessment

The Air Quality assessment (Chapter 8 of the accompanying EIAR) includes consideration of Ecological receptors (refer in particular to Sections 8.2.7, 8.2.8, 8.6.2, and 8.8.2 of this chapter). A risk assessment of dust emissions arising from construction activities in relation to the Proposed Development was completed in accordance with the IAQM – Guidance on the Assessment of Dust Emissions from Demolition and Construction6.

Section 8.8.2 summarises the potential cumulative operational effects for ecological receptors. In defining ecological receptors consideration was given to the potential occurrence of sensitive habitats, as set out in Institute of Air Quality Management guidance (Holman et al., 2020), and as described in the Air Pollution Information System (APIS[7]). No European site is located within 2km of the site of the proposed development. Ardamahane Wood pNHA, a woodland site to the west of the site of the proposed development, was identified as a potentially sensitive ecological receptor; ES01 (as defined in Table 8.13; see also Figure 8.1). Further receptors considered included i. woodland area to the south and ii. Woodland area to the east / northeast.

The sensitivity of the Area to Ecological Impacts (IAQM, 2024) is summarised in Table 8-16. Risks associated with dust emissions causing exposure to ecological impacts with no mitigation measures implemented is also summarised in Table 8.18.

- The risk of an ecological impact due to trackout is medium risk.
- The risk of an ecological impact due to construction is medium risk
- the risk of an ecological impact due to earthworks is high risk.

To mitigate these risks best practice dust mitigation measures, appropriate for the proposed development will be implemented to ensure there are no significant impacts at nearby sensitive receptors. Measures are outlined where avoidance and mitigation actions will be put in place to reduce the impact levels such as wind breaks, barriers and frequent cleaning and watering of the construction site roads, further mitigation measures are detailed in Section 8.7. Provided the dust minimisation measures outlined in the dust management plan are adhered to, the air quality impacts during the construction phase will likely not be significant. The DMRB screening air dispersion model from the U.K Highway Agency Design Manual for Roads and Bridges Air Quality Assessment was used to assess the impact of increased traffic movements associated with the development. Projected transport figures from Systra Group were used to predict the concentrations of traffic-derived pollutants in future years. Sensitive residential receptors are shown in Figure 8.2. The results of the impact assessment arising from increased transport for these receptors are presented in Table 8.20, 8.21 and 8.22.

The operational phase of the proposed development has the potential to result in an impact on local air quality as a result of the increased traffic movements associated with the proposed development – this is discussed in Section 8.6.2 of the Air Quality chapter.

Receptors were considered along a transect line at 10m intervals commencing from the nearest point of the sensitive habitat to a distance of 200m (in line with TII guidance; as set out in TII, 2022). Parameters considered included NOx, nitrogen deposition and ammonia, as these parameters have been demonstrated to have negative impacts on certain types of sensitive habitats (as per APIS; Holman et al., 2020; CIEEM, 2021; EPA, 2023). The findings of this assessment are set out in Section 8.6.2 of the chapter and should be referred to. The findings were summarised as follows: "Due to the dominance of background concentrations in the modelled results, almost entirely attributable to agriculture, and the low concentration of the Do-Something Scenario PC to the critical load / level defined by the EPA IN1 (EPA, 2023), the effects of traffic to related to the proposed development on ecological receptors are considered not likely and not significant".

[6] https://iaqm.co.uk/wp-content/uploads/2013/02/Construction-Dust-Guidance-Jan-2024.pdf

[7] https://www.apis.ac.uk/

Additional ecological receptors, in the form of Blarney Bog pNHA (site code 001857) were also included when considering potential cumulative effects (see Section 8.8.2 - Potential Cumulative Operational Effects on Ecological Receptors). Blarney Bog pNHA, which is within 200m of the R617 / N20 was considered due to the potential for traffic changes at the N20 Interchange adjoining the site, due to proposed developments at Ringwood. As was the case for Ardamahane Wood pNHA, findings are summarised for NOx, nitrogen deposition and ammonia. The effects of cumulative emissions on the ecological receptors were predicted to be not likely and not significant.

6. Connectivity to Natura 2000 Sites

6.1. 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 Natura 2000 sites to include in AA, *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 (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) when selecting Natura 2000 sites for inclusion in the AA Screening.

Publicly available spatial data for rivers and catchment boundaries (*EPA Maps*) were used in conjunction with aerial imagery to identify the footprint of the works, pathways and zones of impact for disturbance and water quality impacts from the proposed works, and potential ecological connections to the wider landscape. These were then mapped in relation to Natura 2000 sites (see Figure 6-1 below).

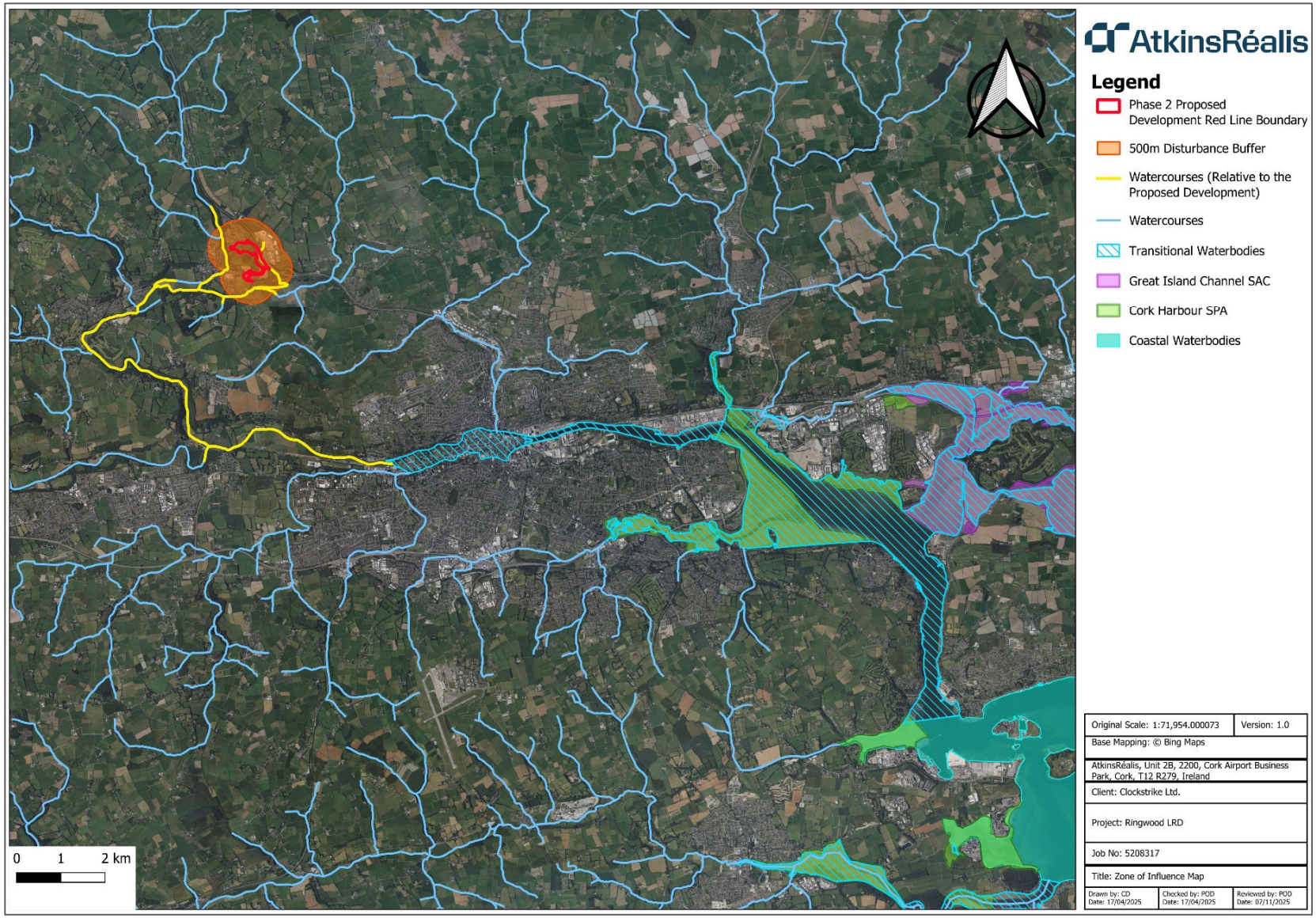


Figure 6-1 Zone of Influence of the Phase 2 Proposed Development in relation to Natura 2000 sites with connectivity.

6.2. Connectivity to European Sites

6.2.1. Special Areas of Conservation

Table 6-1 below details Special Areas of Conservation within the zone of influence of the proposed project and outlines the qualifying interests for which this site has been designated.

As noted, it is proposed to drain surface waters from the eastern portion of the site to the Shean Upper Stream, which is located within the eastern section of the site of the proposed development. The stream discharges to Blarney Bog which is within the catchment of the River Lee. There is a remote hydrological link via the River Lee to Cork Harbour. The site is therefore connected along the River Lee to Great Island Channel SAC (001058). As there is direct hydrological connection this site is considered further.

The other nearest SAC is the Blackwater River (Cork/Waterford) SAC (002170) which is 13.6km to the northeast over land; however, there is no hydrological connection between the site at Ringwood and this SAC.

While there are other sites in the wider environment, such as The Gearagh SAC (000108) (NPWS, 2016), Courtmacsherry Bay SAC (001230) (NPWS, 2014c) and Ballymacoda (Clonpriest and Pillmore) SAC (000077) (NPWS, 2015), these are all located at a significant distance (> 27km straight-line minimum distance) from the proposed development site with no hydrological impact. These are also too remote for any negative air quality impacts.

Table 6-1 - SACs within the potential zone of influence of the proposed development.

Site Name and Code	Distance from Project Site	Qualifying Interests	Within the Zone of Influence
Great Island Channel SAC (001058)[8]	c. 14.2 km SE	• Mudflats and sandflats not covered by seawater at low tide [1140] • Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330]	**Yes** - There is remote hydrological connectivity via the Shean Upper Stream to the Blarney River to the River Lee.
Blackwater River (Cork/Waterford) SAC (002170)[9]	c. 13.6km NE	• Estuaries [1130] • Mudflats and sandflats not covered by seawater at low tide [1140] • Perennial vegetation of stony banks [1220] • Salicornia and other annuals colonising mud and sand [1310] • Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] • Mediterranean salt meadows (Juncetalia maritimi) [1410] • Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260] • Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0] • Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae) [91E0] • *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029] • *Austropotamobius pallipes* (White-clawed Crayfish) [1092] • *Petromyzon marinus* (Sea Lamprey) [1095] • *Lampetra planeri* (Brook Lamprey) [1096] • *Lampetra fluviatilis* (River Lamprey) [1099] • *Alosa fallax fallax* (Twaite Shad) [1103] • *Salmo salar* (Salmon) [1106] • *Lutra lutra* (Otter) [1355]	No - There is no hydrological connection between the site at Ringwood and the catchment of the River Blackwater.

[8] NPWS (2014). *Conservation Objectives: Great Island Channel SAC 001058. Version 1.* National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
[9] NPWS (2012). *Conservation Objectives: Blackwater River (Cork/Waterford) SAC 002170. Version 1.0.* National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

Site Name and Code	Distance from Project Site	Qualifying Interests	Within the Zone of Influence
		• *Trichomanes speciosum* (Killarney Fern) [1421]	
The Gearagh SAC (000108)[10]	c. 27.8km W	• Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260] • Rivers with muddy banks with *Chenopodion rubri* p.p. and Bidention p.p. vegetation [3270] • Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0] • Alluvial forests with *Alnus glutinosa and Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae) [91E0] • *Lutra lutra* (Otter) [1355]	No - The Gearagh SAC is located upstream from the site on the River Lee, whereas the Ringwood site is within the catchment of the Blarney River – River Shournagh which joins the River Lee just upstream of Cork City, a significant distance downstream of The Gearagh SAC. No evidence was recorded on the Shean Upper Stream adjoining the Ringwood site. While Otter do occur on watercourses downstream of Ringwood, these are a significant distance from any otter using the Gearagh SAC.
Courtmacsherry Bay SAC (001230)[11]	c. 30.2km SW	• Estuaries [1130] • Mudflats and sandflats not covered by seawater at low tide [1140] • Annual vegetation of drift lines [1210] • Perennial vegetation of stony banks [1220] • Salicornia and other annuals colonising mud and sand [1310] • Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] • Mediterranean salt meadows (Juncetalia maritimi) [1410] • Embryonic shifting dunes [2110] • Shifting dunes along the shoreline with *Ammophila arenaria (*white dunes) [2120] • Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]	No - There is no spatial overlap or hydrological connection to either the Argideen or Kilbrittain Rivers which flow into the bay.

[10] NPWS (2016). *Conservation Objectives: The Gearagh SAC 000108. Version 1*. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.
[11] NPWS (2014). *Conservation Objectives: Courtmacsherry Estuary SAC 001230. Version 1*. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

Site Name and Code	Distance from Project Site	Qualifying Interests	Within the Zone of Influence
Ballymacoda Bay (Clonpriest and Pillmore) SAC (000077)[12]	42.1km E	• Estuaries [1130] • Mudflats and sandflats not covered by seawater at low tide [1140] • Salicornia and other annuals colonising mud and sand [1310] • Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330] • Mediterranean salt meadows (Juncetalia maritimi) [1410]	No - There is no spatial overlap or hydrological connection to Ballymacoda Bay.

[12] NPWS (2015). *Conservation Objectives: Ballymacoda (Clonpriest and Pillmore) SAC 000077. Version 2.* National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

6.2.2. Special Protection Areas

Table 6-2 below details Special Protection Areas for birds within the zone of influence of the proposed project and outlines the qualifying interests for which this site has been designated.

As noted, it is proposed to drain surface waters from the eastern portion of the site to the Shean Upper Stream, which is located within the eastern section of the site of the proposed development. The stream discharges to Blarney Bog which is within the catchment of the River Lee. There is a remote hydrological link via the River Lee to Cork Harbour. The site is therefore connected along the River Lee to Cork Harbour SPA (004030). As there is direct hydrological connection this site is considered further.

There are no other SPAs in proximity to the site at Ringwood. All other SPAs are >29km (minimum straight-line distance) from the proposed development boundary at Ringwood. These include The Gearagh SPA (004109) (NPWS, 2025a); Mullaghanish to Musheramore Mountains SPA (004162) (NPWS, 2022); Courtmacsherry Bay SPA (004219) (NPWS, 2014d); Blackwater Callows SPA (004094) (NPWS, 2024) and Kilcoman Bog SPA (004095) (NPWS, 2025b).

The site of the proposed development is dominated by improved agricultural grassland (GA1), with some areas of arable land (maize, BC1) and adjoining woodland; it does not support wetland habitats for waders, wildfowl and gulls for which SPAs are predominantly designated. To the south, Blarney Bog pNHA supports ducks such as Teal, Mallard, Wigeon, Gadwall and Shoveler in small numbers; however, works within the site of the proposed development would not disturb waterbirds use of the lakes and associated wetland habitats at Blarney Bog.

Mullaghanish to Musheramore Mountains SPA is designated for breeding Hen harrier. Works at the site of the proposed development will not negatively impact birds of this species nesting and foraging within the SPA. There is currently no evidence of Hen harrier nesting at Blarney Bog. In winter Hen harrier often move away from the nesting area, often heading to coastal wetland sites, which they also often use as secure night roost sites. While Hen harrier have been observed on occasion at Blarney Bog (*pers obs*), there is no evidence of them using it as a night roosting site at present (see. e.g. Lauder *et al*., 2021).

Table 6-2 below details Special Protected Areas within the zone of influence of the proposed project and outlines the qualifying interests for which the site has been designated.

Table 6-2 – SPAs within the potential zone of influence of the proposed development.

Site Name and Code	Distance from Project Site	Qualifying Interests	Comments
Cork Harbour SPA (004030)[13]	c. 9.7km SE (Douglas Estuary (straight-line distance)); 22.6km downstream via R. Lee to Lough Mahon	• 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 (*Mareca penelope*) [A050] • Teal (*Anas crecca*) [A052] • Pintail (*Anas acuta*) [A054] • Shoveler (*Anas clypeata*) [A056] • Red-breasted Merganser (*Mergus serrator*) [A069] • Oystercatcher (*Haematopus ostralegus*) [A130] • Golden Plover (*Pluvialis apricaria*) [A140] • Grey Plover (*Pluvialis squatarola*) [A141] • Lapwing (*Vanellus vanellus*) [A142] • Dunlin (*Calidris alpina*) [A149] • Black-tailed Godwit (*Limosa limosa*) [A156] • Bar-tailed Godwit (*Limosa lapponica*) [A157] • Curlew (*Numenius arquata*) [A160] • Redshank (*Tringa totanus*) [A162] • Black-headed Gull (*Chroicocephalus ridibundus*) [A179] • Common Gull (*Larus canus*) [A182] • Lesser Black-backed Gull (*Larus fuscus*) [A183]	**Yes -** The site proposed for development does not include wetland habitats which would be used by the species for which Cork Harbour SPA has been designated. Due to the distance from the site to Cork Harbour SPA, the construction and operation of the site near Blarney will not disturb any birds using Cork Harbour SPA. A number of wetland bird species do feed on fields outside the SPA (e.g. Curlew, Black-tailed godwit, Lesser black-backed gull and Oystercatcher). The Ringwood site does provide potentially suitable ex-situ foraging opportunities for such species and small numbers of Lesser black-backed gull and curlew were recorded during November and December 2023 and January and February 2024 wintering bird surveys. There is remote hydrological connectivity to the Shean Upper Stream which is within the catchment of the River Lee. The site is therefore considered further in the context of potential impacts on wetland habitats within the SPA and the species it supports.

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

Site Name and Code	Distance from Project Site	Qualifying Interests	Comments
		• Common Tern (*Sterna hirundo*) [A193] • Wetland and Waterbirds [A999]	
The Gearagh SPA (004109)[14]	c. 29.3km W	• Wigeon (*Mareca penelope*) [A050] • Teal (*Anas crecca*) [A052] • Mallard (*Anas platyrhynchos*) [A053] • Coot (*Fulica atra*) [A125] • Wetland and Waterbirds [A999]	No - The site proposed for development does not include wetland habitats which would be used by the species for which The Gearagh SPA has been designated. Wigeon feed on coastal algae, eel grass (*Zostera* sp.) – neither is present on the Ringwood site. They also feed on coastal grassland. This habitat is not present within the site or immediate environs, though small numbers of Wigeon do occur to the south in the open lagoon at Blarney Bog. While interchange of birds such as teal or mallard between The Gearagh and wetland habitats at Blarney Bog, cannot be discounted, suitable habitat is not present within the lands at Ringwood. Furthermore, due to the distance from the SPA, the construction and operation of the site at Ringwood will not affect birds using habitats within The Gearagh SPA. Negative impacts to The Gearagh SPA are not anticipated.
Mullaghanish to Musheramore Mountains SPA (004162)[15]	c. 28.2km W	• Hen Harrier (*Circus cyaneus*) [A082]	No - Mullaghanish to Musheramore Mountains SPA is designated for breeding Hen harrier. Works at Ringwood will not negatively impact birds nesting and foraging within the SPA.

[14] NPWS (2025a). *Conservation objectives for The Gearagh SPA [004109]. First Order Site - specific Conservation Objectives Version 1.0*. Department of Housing, Local Government and Heritage.
[15] NPWS (2022). *Conservation Objectives: Mullaghanish to Musheramore Mountains SPA 004162. Version 1.* National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.

Site Name and Code	Distance from Project Site	Qualifying Interests	Comments
			There is currently no evidence of Hen harrier nesting at Blarney Bog. In winter Hen harrier often move away from the nesting area, often heading to coastal wetland sites, which they also often use as secure night roost sites. While Hen harrier have been observed on occasion at Blarney Bog (*pers obs*), there is no evidence of them using it as a night roosting site at present (see. E.g. Lauder *et al*., 2021). Suitable roosting areas within the bog are, however, sufficiently remote and screened (by e.g. willow woodland along its edge), that birds using the site would not be disturbed by housing proposed for Ringwood. The bog is also separated from Ringwood by a public walk and the R617/N20 and an area of young conifer plantation. Negative impacts to Musheramore Mountains SPA are not anticipated.
Courtmacsherry Bay SPA (004219)[16]	c. 30.8km SW	• Great Northern Diver (*Gavia immer*) [A003] • Shelduck (*Tadorna tadorna*) [A048] • Wigeon (*Mareca penelope*) [A050] • Red-breasted Merganser (*Mergus serrator*) [A069] • Golden Plover (*Pluvialis apricaria*) [A140] • Lapwing (*Vanellus vanellus*) [A142] • Dunlin (*Calidris alpina*) [A149] • Black-tailed Godwit (*Limosa limosa*) [A156] • Bar-tailed Godwit (*Limosa lapponica*) [A157]	No - There is no suitable habitat for coastal / estuarine species such as Great Northern Diver, Red-breasted merganser or Shelduck at Ringwood. There is no suitable habitat for coastal / estuarine waders such as Dunlin or Bar-tailed Godwit at Ringwood. Cork Harbour is also designated for species such as Golden Plover, Lapwing, Black-tailed Godwit and Curlew which are also known to feed in fields outside of SPA boundaries. While interchange between Cork

[16] NPWS (2014). *Conservation Objectives: Courtmacsherry Bay SPA 004219. Version 1.* National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

Site Name and Code	Distance from Project Site	Qualifying Interests	Comments
		• Curlew (*Numenius arquata*) [A160] • Black-headed Gull (*Chroicocephalus ridibundus*) [A179] • Common Gull (*Larus canus*) [A182] • Wetland and Waterbirds [A999]	Harbour SPA and Courtmacsherry Bay SPA cannot be entirely discounted, the distance between the sites is such that it is unlikely or if it were to occur would only be small in scale. Furthermore, The November and December 2023 / January and February 2024 surveys at Ringwood show no evidence of such foraging within the Ringwood site. Negative impacts to The Gearagh SPA are not anticipated.
Blackwater Callows SPA (004094)[17]	c. 30.8km NE	• Whooper Swan (*Cygnus cygnus*) [A038] • Wigeon (*Mareca penelope*) [A050] • Teal (*Anas crecca*) [A052] • Black-tailed Godwit (*Limosa limosa*) [A156] • Wetland and Waterbirds [A999]	No - The site proposed for development does not include wetland habitats which would be used by the species for which Blackwater Callows SPA has been designated. As previously noted the lakes and wetland habitat at Blarney Bog do support wildfowl such as Wigeon and Teal. However, the distance between Blarney Bog and the Callows is such that interchange of birds is unlikely. Even if some interchange were to occur birds using Blarney Bog would not be disturbed by housing proposed for Ringwood. The bog is also separated from Ringwood by a public walk and the R617/N20 and an area of young conifer plantation. Whooper Swan have not previously been recorded from Ringwood or environs. Black-tailed Godwit is also a qualifying interest of Cork Harbour SPA; none were

[17] NPWS (2024). *Conservation Objectives: Blackwater Callows SPA 004094. Version 1.* National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.

Site Name and Code	Distance from Project Site	Qualifying Interests	Comments
			recorded on the Ringwood site during winter surveys for field feeding birds in November and December 2023 or January and February 2024. Negative impacts to Blackwater Callows SPA are not anticipated.
Kilcoman Bog SPA (004095)[18]	c. 34km N	• Whooper Swan (*Cygnus cygnus*) [A038] • Teal (*Anas crecca*) [A052] • Shoveler (*Anas clypeata*) [A056] • Wetland and Waterbirds [A999]	No - The site proposed for development does not include wetland habitats which would be used by the species for which The Gearagh SPA has been designated. As previously noted the lakes and wetland habitat at Blarney Bog do support wildfowl such as Shoveler and Teal. However, the distance between Blarney Bog and the Callows is such that interchange of birds is unlikely. Whooper Swan have not previously been recorded from Ringwood or environs. Black-tailed Godwit is also a qualifying interest of Cork Harbour SPA; none were recorded on the Ringwood site during winter surveys for field feeding birds in November and December 2023 and January and February 2024. Negative impacts to Kilcolman Bog SPA are not anticipated.

[18] NPWS (2025b) *Conservation Objectives: Kilcolman Bog SPA 004095.* Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.

6.3. Brief Description of European sites

6.3.1. Great Island Channel SAC

The Great Island Channel SAC is described as follows in the NPWS site synopsis (NPWS, Version date: 24.09.2013): -

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

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

[1140] Tidal Mudflats and Sandflats

[1330] Atlantic Salt Meadows

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

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

The site is extremely important for wintering waterfowl and is considered to contain three of the top five areas within Cork Harbour, namely North Channel, Harper's Island and Belvelly-Marino Point. Shelduck is the most frequent duck species with 800-1,000 birds centred on the Fota/Marino Point area. There are also large flocks of Teal and Wigeon, especially at the eastern end. Waders occur in the greatest density north of Rosslare, with Dunlin, Godwit, Curlew and Golden Plover the commonest species. A population of about 80 Grey Plover is a notable feature of the area. All the mudflats support feeding birds; the main roost sites are at Weir Island and Brown Island, and to the north of Fota at Killacloyne and Harper's Island. Ahanesk supports a roost also but is subject to disturbance. The numbers of Grey Plover and Shelduck, as given above, are of national importance. The site is an integral part of Cork Harbour which is a wetland of international importance for the birds it supports. Overall, Cork Harbour regularly holds over 20,000 waterfowl and contains internationally important numbers of Black-tailed Godwit (1,181) and Redshank (1,896), along with nationally important numbers of nineteen other species. Furthermore, it contains large Dunlin (12,019) and Lapwing (12,528) flocks. All counts are average peaks, 1994/95 – 1996/97. Much of the site falls within Cork Harbour Special Protection Area, an important bird area designated under the E.U. Birds Directive.

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

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

6.3.1.1. Qualifying Interests of Great Island Channel SAC

Great Island Channel SAC is designated for the following habitats and species:

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

6.3.1.2. Conservation Objectives of Great Island Channel SAC

The conservation objectives for Great Island Channel SAC and the list of specific attributes and targets defining the conservation objectives for each feature of interest can be found on the NPWS website[19].

6.3.2. Cork Harbour SPA

The Cork Harbour SPA is described as follows in the NPWS site synopsis (NPWS, Version date: 21.1.2015): -

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

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

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

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

[19] https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000108.pdf

winter and autumn, especially Black-headed Gull (3,640), Common Gull (1,562) and Lesser Black-backed Gull (783), all of which occur in numbers of national importance. Little Egret and Mediterranean Gull, two species which have recently colonised Ireland, also occur at this site.

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

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

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

6.3.2.1. Qualifying Interests of Cork Harbour SPA

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

- Redshank (*Tringa totanus*) [A162]
- Black-headed Gull (*Chroicocephalus ridibundus*) [A179]
- Common Gull (*Larus canus*) [A182]
- Lesser Black-backed Gull (*Larus fuscus*) [A183]
- Common Tern (*Sterna hirundo*) [A193]
- Wetland and Waterbirds [A999]

6.3.2.2. Conservation Objectives

- To maintain the favourable conservation condition of Little Grebe in Cork Harbour SPA.
- To maintain the favourable conservation condition of Great Crested Grebe in Cork Harbour SPA.
- To maintain the favourable conservation condition of Cormorant in Cork Harbour SPA.
- To maintain the favourable conservation condition of Grey Heron in Cork Harbour SPA.
- To maintain the favourable conservation condition of Shelduck in Cork Harbour SPA.
- To maintain the favourable conservation condition of Wigeon in Cork Harbour SPA.
- To maintain the favourable conservation condition of Teal in Cork Harbour SPA.
- To maintain the favourable conservation condition of Pintail in Cork Harbour SPA.
- To maintain the favourable conservation condition of Shoveler in Cork Harbour SPA.
- To maintain the favourable conservation condition of Oystercatcher in Cork Harbour SPA.
- To maintain the favourable conservation condition of Golden Plover in Cork Harbour SPA.
- To maintain the favourable conservation condition of Grey Plover in Cork Harbour SPA.
- To maintain the favourable conservation condition of Lapwing in Cork Harbour SPA.
- To maintain the favourable conservation condition of Dunlin in Cork Harbour SPA.
- To maintain the favourable conservation condition of Black-tailed Godwit in Cork Harbour SPA.
- To maintain the favourable conservation condition of Bar-tailed Godwit in Cork Harbour SPA.
- To maintain the favourable conservation condition of Curlew in Cork Harbour SPA.
- To maintain the favourable conservation condition of Redshank in Cork Harbour SPA.
- To maintain the favourable conservation condition of Greenshank in Cork Harbour SPA.
- To maintain the favourable conservation condition of Black-headed Gull in Cork Harbour SPA.
- To maintain the favourable conservation condition of Common Gull in Cork Harbour SPA.
- To maintain the favourable conservation condition of Lesser Black-backed Gull in Cork Harbour SPA.

- To maintain the favourable conservation condition of Common Tern in Cork Harbour SPA.
- To maintain the favourable conservation condition of the wetland habitat in Cork Harbour SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.

7. 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.

The following subsections detail the specific effects on each receptor and evaluate their significance in view of the relevant conservation objectives.

7.1. Identification of potential impacts on the Great Island Channel SAC

7.1.1. Potential Direct Impacts

The proposed development does not occur within or directly adjacent to the Great Island Channel SAC and there will be no direct impacts, such as habitat loss or habitat modification, as a result of the proposed development at the lands at Ringwood.

7.1.2. Potential Indirect Impacts

7.1.2.1. Indirect impacts via surface water run-off during construction and operational phase

As outlined above surface waters from the western part of the Ringwood lands will discharge to an existing network / outfall to the River Martin (located to the west of the site). The River Martin joins the Blarney River downstream of Blarney Bog pNHA. The eastern side of the site will be drained to the Shean Upper Stream which lies within the Phase 2 proposed development boundary. The stream discharges into the lake at Blarney Bog; waters discharge from Blarney Bog pNHA before they are joined by the River Martin downstream of the pNHA. To the southwest of Blarney, they join the Shournagh River; the Shournagh is then joined by the Owennagearagh River to the southwest of Tower. The Shournagh joins the main channel of the River Lee at Carrigrohane to the west of Cork City. There is, accordingly, a remote hydrological link between the development site and European sites in Cork Harbour. Intervening waters provide significant dilution of any inputs.

As noted above, the eastern side of the site will discharge to the Shean Upper Stream. This will stop short of the stream. This will allow the drainage system to tie it in with the proposed "outer-zone" attenuation basin (per IFI guidance (IFI, 2016)) for the Phase 2 of the proposed scheme (MHL, 2025c). Thus, other than works in areas of GA1 on the approach to the stream there will be no instream works or works on the riverbank; thus, no direct impacts to the Shean Upper stream (FW4).

When considering the potential for impacts on annexed habitats consideration was given to each of the Attributes for Habitat 1140 (Table 7-1 and 1330 (Table 7-2) as set out in the Conservation Objective Supporting documentation (NPWS, 2014a).

Table 7-1 - Attributes of 1140 Mudflats and sandflats not covered by seawater at low tide (from NPWS, 2014a).

1140	Mudflats and sandflats not covered by seawater at low tide		
To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in Great Island Channel SAC, which is defined by the following list of attributes and targets:			
Attribute	Measure	Target	Notes
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes. See Map 3 of NPWS, 2014a.	Habitat area was estimated using as 723ha using OSi data
Community distribution	Hectares	Conserve the following community type in a natural condition: Mixed sediment to sandy mud with polychaetes and oligochaetes community complex. See Map 4 of NPWS, 2014a.	Based on intertidal and subtidal surveys undertaken in 2006 (Aquafact, 2007) and 2011 (EcoServe, 2012; MERC, 2012). See marine supporting document for further information.

Table 7-2 - Attributes of 1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) (from NPWS, 2014a).

1330	Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)		
To restore the favourable conservation condition of Atlantic salt meadows (Glauco-Puccinellietalia maritimae) in Great Island Channel SAC, which is defined by the following list of attributes and targets:			
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-sites mapped: Bawnard - 0.29ha; Carrigatohil - 1.01ha. See Map 5 of NPWS, 2014a.	Based on data from Saltmarsh Monitoring Project (SMP) (McCorry and Ryle, 2009). Two sub-sites that supported Atlantic salt meadow were mapped (1.30ha) and additional areas of potential saltmarsh (17.60ha) were identified from an examination of aerial photographs, giving a total estimated area of 18.90ha. Saltmarsh habitat has also been recorded at two other sub-sites within the SAC (Curtis and Sheehy Skeffington, 1998). NB further unsurveyed areas maybe present within the SAC. See coastal habitats supporting document for further details.
Habitat distribution	Occurrence	No decline or change in habitat distribution, subject to natural processes. See Map 5 of NPWS, 2014a.	Based on data from McCorry and Ryle (2009). Within the sites surveyed by the SMP, estuary type saltmarsh over a mud substrate is most common and ASM is the dominant saltmarsh habitat. NB further unsurveyed areas maybe present within the SAC. See coastal habitats supporting document for further details.
Physical structure: sediment supply	Presence/ absence of physical barriers	Maintain/restore natural circulation of sediments and organic matter, without any physical obstructions	Based on data from McCorry and Ryle (2009). At Bawnard there is a seawall that was constructed in the 18th-19th centuries. At Carrigatohil the northern and eastern shorelines have been significantly modified by road construction. Part of the saltmarsh has also been infilled. See

1330	Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)		
			coastal habitats supporting document for further details
Physical structure: creeks and pans	Occurrence	Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession	Based on data from McCorry and Ryle (2009). The ASM at Carrigatohil is poorly developed, though some of the larger sections contain salt pans. The smaller sections, however, tend to be quite uniform in topography. The saltmarsh topography at Bawnard is poorly developed with few typical saltmarsh features. See coastal habitats supporting document for further details
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime	Based on data from McCorry and Ryle (2009). At Bawnard, the entire bay empties at low tide to expose soft intertidal mudflats. See coastal habitats supporting document for further details
Vegetation structure: zonation	Occurrence	Maintain range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Based on data from McCorry and Ryle (2009). Zonations to Salicornia flats and intertidal mudflats occurs at Carrigatohil. At Bawnard, there is succession from saltmarsh to brackish saltmarsh and wet grassland as well as zonation to intertidal mudflats at the lower saltmarsh boundary. See coastal habitats supporting document for further details
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward	Based on data from McCorry and Ryle (2009). At Carrigatohil, the sward height is quite tall due to lack of grazing. At Bawnard only part of the site is grazed. See coastal habitats supporting document for further details
Vegetation structure: vegetation cover	Percentage cover at a representative number of monitoring stops	Maintain more than 90% area outside creeks vegetated	Based on data from McCorry and Ryle (2009). Some poaching was noted in places at Bawnard. See coastal habitats supporting document for further details
Vegetation composition: typical species and subcommunities	Percentage cover at a representative number of monitoring stops	Maintain range of subcommunities with typical species listed in SMP (McCorry and Ryle, 2009)	See coastal habitats supporting document for further details

1330	Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)		
Vegetation structure: negative indicator species - *Spartina anglica*	Hectares	No significant expansion of common cordgrass (*Spartina anglica*), with an annual spread of less than 1% where it is known to occur	Based on data from McCorry and Ryle (2009). Spartina occurs at both sub-sites in this SAC. See coastal habitats supporting document for further details

Construction Phase

Potential water quality impacts arising from construction activities (including site preparation) include pollution of surface waters and groundwater by sediment, cementitious materials (e.g. concrete), hydrocarbons (e.g. diesel, hydraulic oils and lubricating oils) and other deleterious matter. In the case of the proposed development, these include fine sediment from excavations and earthworks, fuels and other hydrocarbons from vehicles, plant and machinery, concrete and other construction materials, and waste from on-site welfare facilities.

As noted in Section 4 above, interceptor drains will be installed prior to the earthworks commencing in order to prevent overland flows interacting with earthworks; a mobile oil filter separator system will also be used. This will be used until construction programme has reached the stage when surface water discharges can be passed through the two specified newly installed hydrocarbon interceptors. From there the runoff will be directed into surface water attenuation chamber, which in turn will discharge via a hydro-brake flow control device into the River Martin. The surface water attenuation chamber is being constructed as a sealed unit to ensure ground water cannot seep into the chamber system and that runoff from the redeveloped site can be limited to discharge through a hydrobrake unit at 2.0-litres/sec maximum.

The construction compound(s) will not be located in close proximity to any drains or surface water features through which sediment or pollutants such as hydrocarbons could be discharged to Cork Harbour. As noted, the nearest watercourse is the Shean Upper Stream which lies within the boundary of the proposed development.

The development lands and construction activities will be managed following routine practices and procedures for the control of pollution from construction sites, including the relevant, well-established guidelines from CIRIA and TII, as listed in the outline Construction Environmental Management Plan (oCEMP; MHL, 2025a) included with the application. These include controls on the phasing of works, waste management, location of construction compounds, and surface water management.

Given the works sequence and methodology, the probability of any significant pollution event occurring is minimal and the magnitude of any negative water quality impacts, were they to occur, would be low and their duration brief or temporary. Given the low probability and significance of any water quality impacts within the construction site, any impacts on 'Mudflats and sandflats not covered by seawater at low tide' (1140) or 'Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)' (1330) in the Great Island Channel SAC (>1km further downstream) would be imperceptible. As such, the possibility of significant effects on these qualifying interests from construction-phase water quality impacts can be excluded at this stage.

Operational Phase

Potential water quality impacts from the operation of the proposed development relate to run-off from the new and upgraded roads, footpaths and cycleways. The impermeability of these surfaces can result in increased run-off rates. Run-off from roads can be contaminated by hydrocarbons such as fuels, oils, greases, coolants and anti-freeze from vehicles and micro-plastics such as tyre dust, as well as general litter and fine sediments. Increased run-off rates and contaminants from roads (as well as footpaths and cycleways) can negatively impact on water quality and hydrological regime in receiving waterbodies.

The approach to surface water drainage and attenuation as well as the proposed sustainable urban drainage systems to be used in this project are set out in full the accompanying *Drainage Impact Assessment. SUDS Statement* (MHL, 2025c), as well as in the *Landscape Design Rationale* (CSR, 2025a). Refer also to Chapter 15 – Water of the accompanying EIAR.

The *Engineering Planning Design Report* (MHL, 2025b) sets out the Storm Water Management Plan for Phase 2 of the proposed development at Ringwood and includes both sustainable urban drainage systems and

attenuation tanks. The design of the pipework and stormwater attenuation tanks for the proposed development considered both summer and winter rainfall profiled to determine the critical design parameters. Summer profiles, characterised by higher rainfall intensities, lead to elevated runoff rates. Conversely, winter profiles exhibit flatter, more sustained rainfall patterns, resulting in increased runoff volumes. To ensure compliance, the surface water drainage network underwent assessment for maximum and minimum velocities, pipe length, and other relevant factors. The network was designed to uphold velocities within the prescribed limits, with the maximum set at 3.0m/s and the minimum allowed at 0.75m/s. Phase 2 has been divided into 4 no. catchment areas / attenuation tanks that eventually discharge to the public stormwater network/existing watercourses from the development (see Figure 7.2 of MHL, 2025b). SuDS measures are described in detail within the accompanying *Landscape Design Rationale* (CSR, 2025a) and the *Planning Engineering Design Report* (MHL, 2025b).

There is no existing formal surface water network within the proposed development site. There is an existing 225mm diameter Cork City Council storm sewer running for a portion of the nearby Station Road to the south-west of the site. An existing wayleave / storm sewer runs parallel with Station Road, in close proximity with the site's western boundary. This storm run outfalls just south of the proposed new development entrance, out falling into the nearby River Martin.

The River Martin west of the site is a 4th order river and is known as the Manin on EPA Maps (EPA code: 19M01). Biological water quality at Putland's Br (Waterloo) upstream of Ringwood was noted to be Q4 Good in 2023 (on the MARTIN_030). Downstream of the site in Blarney (just d/s Blarney Br (Lower)) also recorded good water quality (Q4) though the data is old – from 1990. The River Martin immediately west of the site (MARTIN_040) is classified as being At Risk of not achieving WFD good status.

As noted, waters from the eastern side of the site will be directed eastwards towards the Shean Upper Stream. A precast headwall will be installed during Phase 1 of the Ringwood LRD; placed at a distance from the stream edge – within the flood envelope of the stream. Waters will the diffusely discharge through vegetation to reach the stream. As part of any future development an integrated system of SuDS, including wetlands will be developed along the corridor of the Shean Upper Stream – both to manage future surface waters and provide biodiversity gain and create / protect an ecological corridor.

Chapter 15 - Water concluded that "*Given the drainage design, use of SuDS measures and on-site treatment methods, and expected discharge rates from the site, the potential effect on surface water during operation is considered to be a* ***long term, imperceptible effect, with a neutral effect on quality*** *i.e., an impact capable of measurement but without noticeable consequences*."

Thus, given the proposed design, the possibility of any negative effects on 'Mudflats and sandflats not covered by seawater at low tide' (1140) or 'Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)' (1330) in the Great Island Channel SAC from the operation of the proposed development can be excluded at this stage.

Potential Indirect Impacts during construction and operational phase via groundwater (hydrogeological pathway)

Chapter 14 of the accompanying EIAR discusses land, soils and geology. It includes consideration of groundwater vulnerability. The proposed site is located within the Ballinhassig East (IE_SW_G_004) groundwater body. The waterbody was classified as Good status for the most recent Water Framework Directive reporting period (2019-2024) and is Not at Risk. Groundwater vulnerability at the site varies, with most of the area to be developed at high vulnerability. This grades to extreme and then rock at or near surface or karst at the south of the site, close to the Ringwood. Detailed measures, such as prevention of chemical pollution from materials to be used on site, to protect groundwater are set out in the EIAR.

The effects of construction on site are predicted to be short-term, slight, adverse, reducing to imperceptible over time (refer to Section 14.7.1 of the accompanying EIAR); while operational impacts are also predicted to be neutral and imperceptible (refer to Section 14.7.2 of the accompanying EIAR). Give remote hydrological connections and distance to downstream Natura 2000 sites negative impacts on Great Island Channel SAC or Cork Harbour SPA mediated via groundwater are not anticipated.

Potential Indirect impact / damage through discharge of treated foul effluent.

As noted, a Pre-Connection Enquiry was submitted to Uisce Éireann. The reference number for this enquiry is CDS23000499. The response to this Enquiry was issued by Uisce Éireann on 23rd of June 2023, which confirmed that the proposed development can be serviced by the existing wastewater infrastructure network in the area. The Confirmation of Feasibility (COF) states that sufficient capacity is available in the IW network to facilitate a

wastewater connection of 500 units. IW have advised that in order to facilitate the wastewater connection, it will be required to upgrade approximately 450m of foul sewer on the Station Road from 225mm to 300mm /450mm at a minimum. Irish Water have advised that they are commencing network upgrade works in Blarney in the short term.

Thus, the foul generated by the proposed development would be catered for within existing and permitted treatment facilities which have already been subject to Appropriate Assessment based on specific P.E.'s. IW have confirmed that the proposed development can be accommodated. The foul sewer works would be within the urban fabric of Station Road and would be subject to specific environment assessment to be undertaken by IW.

There are no EPA-licensed waste activities in the vicinity of the proposed development (e.g., waste facilities, Industrial Emissions Licensing (IEL), or Integrated Pollution Control (IPC) sites). No negative impacts to receiving water are predicted.

Proposed Indirect habitat/species loss/damage via spread of invasive species (if present at the study site).

The introduction and spread of invasive species can also result in negative impacts within a designated site. As noted, no species listed on the 3rd Schedule of the EC (Bird and Natural Habitats) Regulations, 2011 (S.I. 477/ 2011), have been recorded on site. No 3rd Schedule species were recorded within the site boundaries as illustrated on Figure 1-1.

No invasive species listed on the 3rd Schedule of the Natural Habitats Regulations, S.I. 477 of 2011 have been recorded on site of the proposed development or from the wider Ringwood lands. Due care will however also be taken to prevent the introduction of any invasive species to the site. As a result, no adverse effects shall occur on the Great Island Channel SAC as a result of the potential spread of invasive species.

7.2. Summary

The likelihood of significant effects on the Great Island Channel SAC were discounted. Thus, given the proposed design, the possibility of any negative effects on 'Mudflats and sandflats not covered by seawater at low tide' (1140) or 'Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)' (1330) in the Great Island Channel SAC from the operation of the proposed development can be excluded at this stage.

7.3. Identification of potential impacts on the Cork Harbour SPA

7.3.1. Potential Impacts

The proposed development does not occur within Cork Harbour SPA (NPWS, 2014b) and as such there will be no direct impact such as habitat loss or habitat modification as a result of the proposed development at the site of the proposed development at Ringwood.

Consideration of potential surface or ground water impacts are as discussed above for Great Island Channel SAC. These comments also apply to Cork Harbour SPA.

A number of birds for which Cork Harbour has been designated are known to feed in fields outside the SPA. These include Oystercatcher, Curlew, Lesser black-backed gull, Black-tailed Godwit, Golden Plover, and Lapwing. Results of field feeding surveys undertaken in November, December 2023 and January, February 2024 are discussed in Section 5.3.4 above and further detailed within Chapter 11: Biodiversity of the accompanying EIAR. Field are numbered in Figure 5-7; field numbers 1, 4, 5, 6, 8, and 10 overlap with the site of the proposed development. As noted no significant evidence of field feeding by these species was noted. A number of walkers with dogs were observed during field survey work; it is therefore possible at these fields which are quite close to residential developments in Blarney are too heavily disturbed to be routinely used by field feeding waders. Such species would in particular be disturbed by dogs off the lead.

Wetland habitat in the form of Blarney Bog and Blarney Lake occur to the south. Birdwatch Irelands Irish Wetland Bird Survey (I-WeBS) has monitored Blarney Bog pNHA named Blarney Fen – Clogheenmilcon (site code: 0L320) in the past. The site was most recently surveyed in 2014/2015 wintering bird season in which species Mute swan, Gadwall, Teal, Mallard, Grey heron, and Moorhen were recorded in September of 2014. At nearby (c. 1.8km to the southwest over land) I-WeBS site Blarney Lake (site code: 0L040) additional species recorded include Shoveler, Pochard (*Aythya farina*), Tufted duck (*Aythya fuligula*), Scaup[20] (*Aythya marila*), Great crested grebe, Cormorant, Little egret, Coot (*Fulica atra*), Black-headed gull and Common/Mew gull. However, wetland birds using either site would not be disturbed by construction or operation at the site of the proposed development.

In the case of Blarney Bog a public walk and the R617/N20 run along the boundary of the bog and separate it from any development in Ringwood. Conifer woodland on the southern boundary of the Ringwood land parcel was felled recently, but has been replanted. It will in time further screen the Ringwood lands. Disturbance of birds at Blarney Bog / Lake by the proposed development is not anticipated.

Thus, ex-situ impacts on field feeding birds which are qualifying interests of the adjoining Cork Harbour SPA are not anticipated.

In summary, the proposed development at Ringwood is not predicted to result in significant effects on the qualifying interests of Cork Harbour SPA.

7.4. Summary

On the basis of objective information presented above, the proposed development is not likely to result in significant effects on the qualifying interests of the Great Island Channel SAC and Cork Harbour SPA, or indeed other Natura 2000 sites. The potential for such effects to occur in combination with other plans and projects is considered in Section 8 below.

[20] This is likely to be an isolated record. Scaup usually frequent coastal estuaries and bays, on brackish lagoons and in shallow marine waters in Winter (Source: BWI species description).

8. In Combination Impacts

8.1. 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.

8.2. 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.

8.2.1. 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.

However, given the scale of the proposed works and localised extents of the impacts associated with them in this case, it was deemed sufficient to include only areas in close proximity to the proposed works and their zones of impact in the geographical scope for identifying potential in-combination effects. As such, the focus was mainly on the Blarney/Tower area and the River Shournagh catchment.

8.2.2. Timescale

It was considered appropriate to include any 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.

Future development is being considered at Ringwood; this would include residential housing to the south and northeast as well as a spine road which would provide vehicular, cyclist and pedestrian access to the south and north (including potentially a crossing of the N20). However, while this is discussed at site level (in terms of potential impacts on biodiversity locally), detailed designs or a proposed programme for any such works in not available at this time. It is therefore not appropriate to include any such future, un-permitted development in the consideration of potential in combination impacts.

8.2.3. Sources of Information

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

- Cork City Development Plan 2022-2028 - https://www.corkcity.ie/en/cork-city-development-plan/
- An Bord Pleanála Map Search - https://www.pleanala.ie/en-ie/map-search
- EIA Portal - https://housinggovie.maps.arcgis.com/apps/webappviewer/index.html?id=d7d5a3d48f104ecbb206e7e5f84b71f1
- National Planning Application Database (NPAD) Map Viewer - https://housinggovie.maps.arcgis.com/apps/webappviewer/index.html?id=9cf2a09799d74d8e9316a3d3a4d3a8de
- EPA Maps - https://gis.epa.ie/EPAMaps

8.3. Plans

The Cork City Development Plan, 2022-2028 sets out policies and objectives for the development of the City during the period of the Plan. The Plan seeks to secure the sustainable development and improvement of the economic, environmental, cultural and social assets of Cork City. The Plan has outlined objectives for biodiversity within the city. These include:

- Providing protection to all designated sites, national and European, and to maintain or develop linkages between these,
- Providing protection to protected plants and animals in accordance with legal requirements, and
- Retain areas of local biodiversity value, ecological corridors and habitats which contribute to the city ecological network, to protect them from inappropriate development.

A NIR was prepared for the Cork City Development Plan which assessed the Plan and its potential to adversely affect the integrity of Natura 2000 sites. The findings of the NIR were integrated into the Plan, ensuring that potential impacts were avoided and reduced. Thus, an AA determination was made by Cork City Council that the Plan will not adversely affect the integrity of Natura 2000 sites due to the incorporation of mitigation measures into the Plan during the AA process.

8.4. Projects

A review of the An Coimisiún Pleanála online planning map, which shows all applications, appeals etc. to An Bord Pleanála from 2016 onwards, identified 14 no. projects which, due to their nature, scale or location, give rise to a potential for significant effects in combination with the proposed development. These projects are listed and described in Table 8-1 below. These include Phase 1 of the Ringwood LRD as well as several residential developments which would give rise to impacts of a similar nature and magnitude to the proposed development. The planning conditions for these projects include controls on the generation of surface and groundwater pollution during both the construction and operational phases, most notably limitations on development in line with the capacity available at the local wastewater treatment plants (Blarney and Killeens). These controls are considered sufficient to rule out any likely significant effects in combination with the proposed development. A review of the EIA Portal found a single additional project uploaded in December 2025; this is included within Table 8-1 below.

In time it is proposed to upgrade the N20 to motorway status (M20) to the east of the scheme. Detailed designs are not available for review. The road scheme will however need to undertake a comprehensive programme of ecological survey as well as design and construct an appropriate programme of ecological mitigation, including but not limited to landscape planting, allowing for biodiversity net gain, mammal fencing and underpasses as appropriate, etc. Given the recent observation of a dead badger on the N20 east of the proposed development, the inclusion of mammal mitigation measures would help to reduce the risk of mammal road mortality. As Sika have been recorded from Blarney Bog pNHA most recently in 2021, mammal mitigation for deer may also be required. Future potential development is noted to occur at Monacnapa, for which a LRD was refused planning permission on the 7th November 2025 (ACP Case Ref: TA28.319963); this development has the potential to be resubmitted in the future.

Further, the Cork Area Commuter Rail Project which is being progressed by Iarnród Éireann through a number of separate but interrelated projects which will be delivered in specific work packages which will be subject to a future Railway Order to An Coimisiún Pleanála. Phase 2 of the Project focuses on proposals for eight new stations for Cork, three station upgrades, a new depot, and full electrification of the Cork rail network. One of the 8 new stations is to be located at Blarney/Stoneview to the northeast of the subject site. Further Phase 2 works include the provision of a Strategic Park and Rides at Blarney/Stoneview.

The capacity of the Strategic Park and Ride facilities will be in the range of 400 – 600 spaces which will include Mobility Impaired Parking located close to the station entrance, standard car parking, motorcycle parking and bicycle parking including secure bicycle lockers.

Table 8-1 - Projects identified through the An Coimisiún Pleanála and EIA Portal Map Search.

Planning Authority	Ref. No.	Applicant Name	Location	Description (as per database)
An Coimisiún Pleanála				
Cork City Council	LH28.321688	Clockstrike Ltd.	Ringwood, Shean Upper, Blarney, Co. Cork	Large-scale residential development: Construction of 246 residential units, a crèche and all associated site works. An Environmental Impact Assessment Report (EIAR) has been prepared. (www.ringwoodphase1lrd.ie).
Cork County Council	ZD04G.ZD2012	Cork County Council	Monard, Co. Cork	Monard Strategic Development Zone Planning Scheme - proposed development of a new town based upon and linked with the upgrading and re-instatement of the rail lines, accommodating c. 5,000 No. new homes and a population of c. 13,000 No.
Cork County Council	PL04.248614	O'Leary and O'Sullivan Developments Ltd	Castleowen, Monacnapa, Knockacorbally, Blarney, Co. Cork	Demolition of dwelling and construction of 88 residential units with crèche, surface water attenuation tank, vehicular entrance, landscaping and all associated site works.
Cork City Council	PL28.309152	Irish Conference and Leisure Holdings Limited	Site of former Blarney Park Hotel, and Leisure Centre, St Anns Road, Monacnapa, Blarney, Co. Cork	Mixed use development comprising hotel, licensed supermarket, café/coffee shop, office block and commercial building.
Cork County Council	PL04.247742	Scoil Mhuiregan Smál - Board of Management	Shean Lower, Blarney, Co. Cork	Three storey post primary school building.
Cork County Council	PL04.305373	Hydro Estates Limited	St Ann's Hill, Kilnamucky Tower, Blarney, Co. Cork	Construction of a nursing home, 29 no. detached houses and all ancillary site works. Partial demolition, conservation, refurbishment, alteration and change of use of the remains of the former St. Ann's Hydropathic Establishment which is a Protected Structure (RPS 00815).
Cork City Council	TA28.320056	Cloghroe Development Limited	Coolflugh, Cloghroe, Tower, Co. Cork	198 no. residential units (117 no. houses, 81 no. apartments) and associated site works.
Cork City Council	**PL28.312531**	**O Flynn Construction co. Unlimited Company**	**Kilronan, Ballycannon, Kerrypike, Co. Cork**	**Construction of 60 dwellings.**
Cork City Council	PL28.308657	TFT Construction Ltd	Crenagh Hill, Woodside (townland), Kerry Pike, Cork	Construct 13 dwelling houses and all associated ancillary development works including access roads, parking, footpaths, drainage, landscaping and amenity areas.

Planning Authority	Ref. No.	Applicant Name	Location	Description (as per database)
Cork City Council	PL28.314905	O Flynn Construction (Horlans) Ltd	Coolymurraghue , Upper Leemount, Kerry Pike, Co. Cork	94 houses.
Cork City Council	PL28.308670	JAW Asset Holdings Limited	Saint Ann's Road, Monacnapp , Blarney, Cork.	Construction of a three-storey primary care centre, 5 no. retail units and a café and all associated works.
Cork County Council	PL04.318852	Harmony Solar Cork Limited	Rahanisky, Killeendaniel, Monard, Co. Cork	10 year permission and 40 year operation period for solar farm and underground grid connection and associated site works. Works to include installation of underground cables. These works will be in the jurisdiction of Cork County Council and Cork City Council. A concurrent planning application will be lodged with Cork City Council for the remainder of the underground cable along the public roads to allow connection to the Kilbarry 110kV Substation in Blackpool, Cork City under Section 34 of the Planning and Development Act 2000 (PDA)(as amended).
Cork County Council	PL04.304045	HW Planning	Garravagh, Inniscarra, Co. Cork	Solar farm circa 85,000sq.m of solar panels, 1 substation, 6 electrical inverter/transformer stations, battery storage module, associated equipment container. Operational lifespan will be 35 years.
EIA Portal				
An Coimisiún Pleanála	2025228	SRCL Ireland Ltd (T/A Stericycle)	Block 8003, Blarney Business Park, Shean Upper, Blarney, County Cork, T23 EYH5	The proposed development will comprise the installation and operation of Healthcare Waste Treatment and Transfer Facility at an existing unit. The facility will accept up to 15,000 tonnes of packaged healthcare waste per annum for management.

Projects that have been granted planning permission in the vicinity of the proposed project within the last 5 years were reviewed through the NPAD, which unifies the map-based planning databases of all local authorities. These projects number in the hundreds and include alterations or extensions to existing residential properties or new homes. These developments have conditions attached to their planning permission relating to sustainable development, such as siting of septic tanks, foul surface water and effluent drainage facilities, and clean surface water run-off drainage facilities. Therefore, it is not anticipated that the developments that have been granted permission will have any significant effects in combination with the proposed works.

There are 4 no. urban wastewater agglomerations with their treatment plants in the River Shournagh catchment. These are Grenagh (population equivalent (p.e.) 441, design p.e. 1200), Courtbrack (p.e. 250, design p.e. 250), Killeens (p.e. 605, design p.e. 600) (note that this WWTP is currently subject to a planning application for upgrade works) and Blarney (p.e. 7938, design p.e. 13000). While Courtbrack is operating is operating at full capacity and Killeens is currently slightly (p.e. 5) over, there is significant headroom at both Grenagh and Blarney. Q-values at EPA monitoring stations downstream of Stoneview of the Martin/Blarney and Shournagh River were all either Q4 ‘Good’ or Q4-5 ‘High’ when samples in 2023, and the current WFD status is ‘Moderate’ to Tower Bridge and ‘Good’ downstream of Tower Bridge, but ‘At risk’ of not achieving WFD objectives by 2027 on both stretches. The main threat to water quality in the Shournagh catchment appears to be eutrophication from nitrates and orthophosphates. As wastewater from the proposed development will be discharged to the Blarney WwTP, where there is sufficient capacity to treat it, it is considered that wastewater from the operation of the proposed development will not contribute to any additional pressure on water quality in the River Shournagh and receiving waterbodies.

8.5. Other Activities

Farmers and landowners undertake general agricultural operations in the River Shournagh catchment and its tributaries that could potentially give rise to effects on the same qualifying interests the proposed works. Most such operations are periodic, not continuous, and qualify as ‘activities requiring consent’ that require prior

consultation with the NPWS, 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). Such 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 Section 9 of those Regulations if the activity 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.

8.6. Conclusion

Following the assessment above, it can be concluded, based on nature, scale and location of the proposed development and the controls in place on the other plans, projects and activities in its vicinity, that significant effects in combination with other plans or projects are unlikely to occur.

9. Conclusions

This Appropriate Assessment Screening Report has examined the details of the proposed Phase 2 development at Ringwood 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 Department of the Environment, Heritage and Local Government 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 or Cork Harbour SPA, in view of its/their conservation objectives. Therefore, it is the recommendation of the authors of this report that Cork County Council, as the competent authority, may determine that Appropriate Assessment is not required in respect of the proposed development at Ringwood. Should any aspect of the design or construction methodology for the proposed development be materially changed, a new AA Screening Report would be required.

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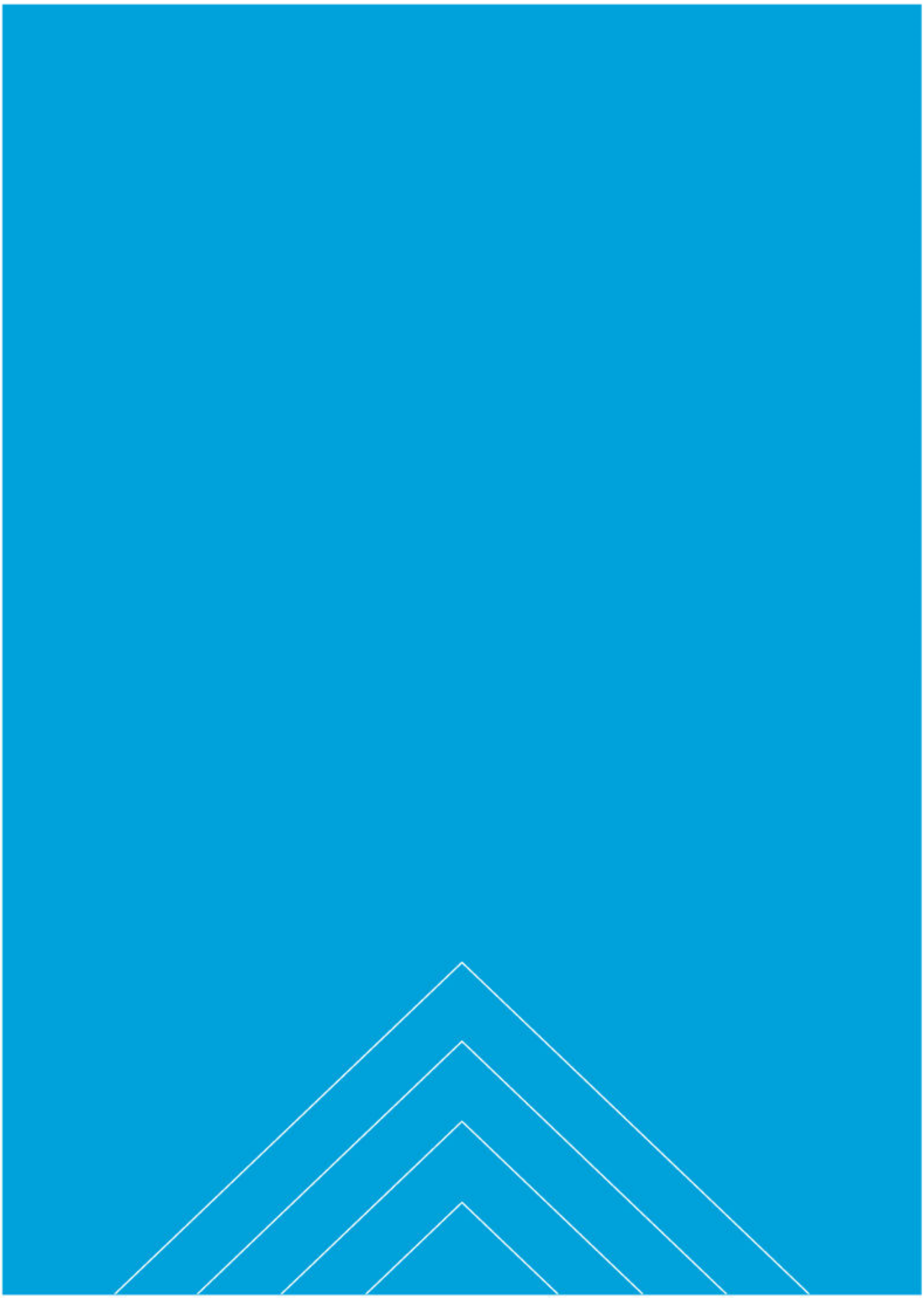
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Appendix A. Biological Water Quality Data

A.1. Q-Sample species compositions, September, and November 2023

Table 1 Q-sample species composition on the Shean Upper Stream (Sites 1 & 2) and Blarney River (Site 3) 28th September 2023.

Taxon	Family	Binomial name	Site 1	Site 2	Site 3	EPA Group
Ephemeroptera	Heptageniidae	*Ecdyonurus dispar*		3		**A**
Trichoptera	Leptoceridae	*Athripsodes aterrimus*			1	**B**
Trichoptera	Sericostomatidae	*Sericostoma personatum*		1		**B**
Trichoptera	Glossosomatidae	*Agapetus fuscipes*		1		**B**
Odonata	Coenagrionidae	sp. indet.			1	**B**
Ephemeroptera	Baetidae	*Baetis rhodani*	12	19		**C**
Trichoptera	Hydropsychidae	*Diplectrona felix*	9	6		**C**
Trichoptera	Philopotamidae	*Philopotamus montanus*	60	4		**C**
Trichoptera	Philopotamidae	*Wormaldia occipitalis*	8			**C**
Trichoptera	Polycentropodidae	*Plectrocnemia geniculata*	4			**C**
Trichoptera	Rhyacophilidae	*Rhyacophila dorsalis*		1		**C**
Coleoptera	Dytiscidae	Dytiscidae larva			2	**C**
Coleoptera	Elmidae	*Elmis aenea* (adult)		2		**C**
Coleoptera	Elmidae	*Limnius volckmari*		7		**C**
Amphipoda	Gammaridae	*Gammarus duebeni*	19	26		**C**
Diptera	Tipuliidae	*Tipula* sp.	3			**C**
Diptera	Chironomidae	Non-chironomus spp.		11		**C**
Diptera	Limoniidae	*Antocha* sp.		1		**C**
Diptera	Pediciidae	*Dicranota* sp.	1			**C**
Diptera	Simuliidae	sp. indet.	7	4		**C**
Mollusca	Lymnaeidae	*Lymnaea stagnalis*			4	**C**
Mollusca	Planorbidae	*Gyraulus albus*			1	**C**
Mollusca	Valvatidae	*Valvata piscinalis*			9	**C**
Amphipoda	Crangonyctidae	Crangonyx sp.			4	**D**
Hirudinidae	Glossiphoniidae	sp. indet.		3	3	**D**
Isopoda	Asellidae	*Asellus aquaticus*		6	10	**D**
Mollusca	Lymnaeidae	*Ampullacaena balthica*			2	**D**
Mollusca	Physidae	*Physa fontinalis*		3	1	**D**
Mollusca	Sphaeriidae	sp. indet.			7	**D**
Diptera	Chironomidae	Chironomus spp.			5	**E**
Annelidae	Oligochaeta	sp. indet.		1		**N/A**
Mollusca	Tateidae	*Potamopyrgus antipodarum*		1		**N/A**
Total Abundance			**123**	**100**	**50**	
Taxon Richness			**9**	**18**	**13**	
Q Rating			**Q3**	**Q3-4**	**Q2-3**	
Water Quality Status			**Poor**	**Moderate**	**Poor**	

Table 2 Q-sample species composition on the Shean Upper Stream (Sites 1 & 2) and Blarney River (Site 3) 9th November 2023.

Taxon	Family	Binomial name	Site 1	Site 2	Site 3	EPA Groups
Ephemeroptera	Heptageniidae	*Ecdyonurus dispar*		5		**A**
Ephemeroptera	Baetidae	*Alainites muticus*	1			**B**
Odonata	Coenagrionidae	sp. indet.			2	**B**
Trichoptera	Glossosomatidae	*Agapetus fuscipes*		1		**B**
Trichoptera	Goeridae	*Silo pallipes*		2		**B**
Trichoptera	Limnephilidae	*Limnephilus marmoratus*			2	**B**
Trichoptera	Limnephilidae	*Potamophylax cingulatus*		2		**B**
Trichoptera	Sericostomatidae	*Sericostoma personatum*		3		**B**
Ephemeroptera	Baetidae	*Baetis rhodani*	21	13		**C**
Trichoptera	Hydropsychidae	*Diplectrona felix*	5	3		**C**
Trichoptera	Philopotamidae	*Philopotamus montanus*	20			**C**
Trichoptera	Philopotamidae	*Wormaldia occipitalis*	4			**C**
Coleoptera	Elmidae	*Limnius volckmari*		2		**C**
Coleoptera	Scirtidae	Scirtidae larva		1		**C**
Coleoptera	Elmidae	*Elmis aenea* (larva)			1	**C**
Diptera	Simuliidae	sp. indet.	3	2	1	**C**
Amphipoda	Gammaridae	*Gammarus duebeni*	31	26		**C**
Hemiptera	Corixidae	*Hesperocorixa linnaei*			4	**C**
Hemiptera	Notonectidae	*Notonecta viridis*			1	**C**
Mollusca	Lymnaeidae	*Stagnicola fuscus*		2		**C**
Mollusca	Lymnaeidae	*Lymnaea stagnalis*			2	**C**
Amphipoda	Crangonyctidae	Crangonyx sp.			2	**D**
Isopoda	Asellidae	*Asellus aquaticus*	1	28	22	**D**
Mollusca	Physidae	*Physa fontinalis*		4	*2*	**D**
Mollusca	Lymnaeidae	*Ampullacaena balthica*			17	**D**
Diptera	Chironomidae	Chironomus spp.			1	**E**
Total Abundance			**86**	**94**	**57**	
Taxon Richness			**8**	**14**	**12**	
Q Rating			**Q3**	**Q3-4**	**Q2-3**	
Water Quality Status			**Poor**	**Moderate**	**Poor**	

Appendix B. Physiochemical Data

Physiochemical water quality results, September & November 2023.

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Analysis Certificate (Blarney Bog)

	Arrival Date	28/09/2023	28/09/2023	28/09/2023	28/09/2023	28/09/2023	28/09/2023
EPA approved	Sample	River 1	River 2	River 3	Lake A	Lake B	Lake C
Yes	pH	7.55	7.58	6.87	7.13	6.87	7.00
Yes	Alkalinity (mg $CaCO_3$/l)	72	81	62	93	73	93
Yes	Conductivity @25° C (µS/cm)	238	283	231	316	281	362
N/A	Total Ammonia (mg N/l)	0.138	0.052	0.095	0.271	0.163	0.031
Yes	Ortho-P (mg P/l)	0.050	0.041	0.200	0.181	0.157	0.036
Yes	Total P (mg P/l)	0.077	0.063	0.379	0.297	0.285	0.064
Yes	Total Oxidised Nitrogen (mg N/l)	2.275	3.472	2.198	1.918	4.209	6.473
Yes	BOD (mg O_2/l)	0.8	0.7	3.0	--	--	--
N/A	Chlorophyll a (µg/l)	--	--	--	14.13	11.53	6.95
Yes	Suspended Solids (mg/l)	6.0	3.2	5.3	5.0	8.5	3.0

Sample Arrival Date: 28-09-23 / Report Date: 04-10-23

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Analysis Certificate (Blarney Bog)

	Arrival Date	09/11/2023	09/11/2023	09/11/2023	09/11/2023	09/11/2023	09/11/2023
EPA approved	Sample	River 1	River 2	River 3	Lake A	Lake B	Lake C
Yes	pH	7.86	7.54	7.43	7.07	7.52	7.03
Yes	Alkalinity (mg $CaCO_3$/l)	82	83	84	98	83	97
Yes	Conductivity @25° C (µS/cm)	272	307	316	363	299	347
Yes	Total Ammonia (mg N/l)	0.037	0.017	0.096	0.105	0.020	0.151
Yes	Ortho-P (mg P/l)	0.030	0.036	0.045	0.082	0.025	0.076
Yes	Total P (mg P/l)	0.047	0.043	0.077	0.140	0.101	0.136
Yes	Total Oxidised Nitrogen (mg N/l)	2.963	4.348	5.408	5.296	4.357	4.831
Yes	BOD (mg O_2/l)	0.7	0.6	0.8	--	--	--
N/A	Chlorophyll a (µg/l)	--	--	--	2.37	8.29	2.57
Yes	Suspended Solids (mg/l)	3.2	3.5	3.5	2.0	42.0	2.5

Sample Arrival Date: 09-11-23 / Report Date: 14-11-23

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