Appendix A

AA Screening Report

Report for Screening for Appropriate Assessment on behalf of Arup

Untreated Agglomerations Study (UTAS) Cork Bundle,

Whitegate-Aghada, Whitegate

September 2020

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Project	**Report for Screening for Appropriate Assessment on behalf of Arup Untreated Agglomerations Study (UTAS) Cork Bundle, Whitegate-Aghada, Whitegate**		
Client	**Arup**		
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1. Introduction

1.1 Background

The information in this report has been compiled by DixonBrosnan Environmental Consultants, on behalf of the applicant. It provides information on and assesses the potential for the proposed development, the Whitegate-Aghada Sewerage Scheme, Whitegate, Co. Cork, to impact on any Natura 2000 sites within its zone of influence. The information in this report forms part of and should be read in conjunction with the planning application documentation being submitted to Cork County Council in connection with the proposed development.

The Birds Directive (2009/147/EC) and the Habitats Directive (92/42/EEC) put an obligation on EU Member States to establish the Natura 2000 network of sites of highest biodiversity importance for rare and threatened habitats and species across the EU. In Ireland, the Natura 2000 network of European sites comprises Special Areas of Conservation (SACs, including candidate SACs) and Special Protection Areas (SPAs, including proposed SPAs). SACs are selected for the conservation of Annex I habitats (including priority types which are in danger of disappearance) and Annex II species (other than birds). SPAs are selected for the conservation of Annex I birds and other regularly occurring migratory birds and their habitats. The annexed habitats and species for which each site is selected correspond to the qualifying interests of the sites and from these the conservation objectives of the site are derived. The Birds and Habitats Directives set out various procedures and obligations in relation to nature conservation management in Member States in general, and of the Natura 2000 sites and their habitats and species in particular. A key protection mechanism is the requirement to consider the possible nature conservation implications of any plan or project on the Natura 2000 site network before any decision is made to allow that plan or project to proceed. Not only is every new plan or project captured by this requirement but each plan or project, when being considered for approval at any stage, must take into consideration the possible effects it may have in combination with other plans and projects when going through the process known as Appropriate Assessment (AA).

The obligation to undertake Appropriate Assessment (AA) derives from Article 6(3) and 6(4) of the Habitats Directive, and both involve a number of steps and tests that need to be applied in sequential order. Article 6(3) is concerned with the strict protection of sites, while Article 6(4) is the procedure for allowing derogation from this strict protection in certain restricted circumstances. As set out in Section 177U of the Planning and Development Act 2000 as amended, a screening for appropriate assessment of an application for consent for the proposed development must be carried out by the competent authority to assess, in view of best scientific knowledge, if the proposed development, individually or in combination with another plan or project is likely to have a significant effect on any European site. Each step in the assessment process precedes and provides a basis for other steps. The results at each step must be documented and recorded carefully so there is full traceability and transparency of the decisions made.

1.2 Aim of this report

The purpose of this report is to inform the AA process as required under the Habitats Directive (92/43/EEC) in instances where a plan or project may give rise to significant impacts on a

Natura 2000 site. This report aims to inform the Appropriate Assessment process in determining whether the development, both alone and in combination with other plans or projects, is likely to have a significant impact on the Natura 2000 sites in the study area, in the context of their conservation objectives and specifically on the habitats and species for which the sites have been designated.

Documentation/guidelines of relevance to this Screening for Appropriate Assessment include the following:

- European Commission, 2001. Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC. Office for Official Publications of the European Communities, Brussels (EC, 2001);
- European Commission, 2000a. Communication from the Commission on the Precautionary Principle., Office for Official Publications of the European Communities, Luxembourg (EC, 2000a);
- Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC Office for Official Publications of the European Communities, Luxembourg (EC, 2018);
- Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the commission; (EC, 2007);
- Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities. Department of the Environment, Heritage and Local Government, Dublin (DEHLG, 2010a);
- Department of Environment Heritage and Local Government Circular NPW 1/10 and PSSP 2/10 on Appropriate Assessment under Article 6 of the Habitats Directive – Guidance for Planning Authorities (DEHLG, 2010b);
- Interpretation Manual of European Union Habitats. Version EUR 28. European Commission (EC, 2013);
- Applications for approval for Local Authority Developments made to An Bord Pleanála under 177AE of the Planning and Development Act, 2000, as amended (Appropriate Assessment): Guidelines for Local Authorities. An Bord Pleanála, Dublin (ABP, 2013).
- CJEU Case C 164/17 Edel Grace Peter Sweetman v An Bord Pleanála

1.3 Authors of Report

This report was prepared by Carl Dixon MSc. (Ecological Monitoring) and Sorcha Sheehy PhD (Ecology/Ornithology). Carl Dixon MSc (Ecology) is a senior ecologist who has over 20 years' experience in ecological and water quality assessments with particular expertise in freshwater ecology. He also has experience in mammal surveys, invasive species surveys and ecological

supervision of large-scale projects. Projects in recent years include the Waste to Energy Facility Ringaskiddy, Shannon LNG Project, supervision of the Fermoy Flood Relief Scheme, Skibbereen Flood Relief Scheme, Upgrade of Mallow WWTP Scheme, Douglas Flood Relief Scheme and Great Island Gas Pipeline. He has carried out ecological surveys and prepared AA Screening/NIS reports for a range of projects.

Sorcha Sheehy PhD (ecology/ornithology) is an experienced ecological consultant with over ten years' experience. She has worked on AA Screening/NIS's for a range of small and large-scale projects with particular expertise in assessing impacts on birds. Recent projects include bird risk assessments for Dublin and Cork Airports, the Waste to Energy Facility Ringaskiddy and Water Storage Schemes for Irish Water.

2. Regulatory Context and the Appropriate Assessment Procedure

2.1 Regulatory context

The Habitats Directive (Council Directive 92/43/EEC on the *Conservation of Natural Habitats and of Wild Fauna and Flora*) aims to maintain or restore the favourable conservation status of habitats and species of community interest across Europe. The requirements of these directives are transposed into Irish law through the European Communities (Birds and Natural Habitats Regulations; S.I. No. 477 of 2011).

Under the Directive a network of sites of nature conservation importance have been identified by each Member State as containing specified habitats or species requiring to be maintained or returned to favourable conservation status. In Ireland the network consists of SACs and SPAs, and also candidate sites, which form the Natura 2000 network.

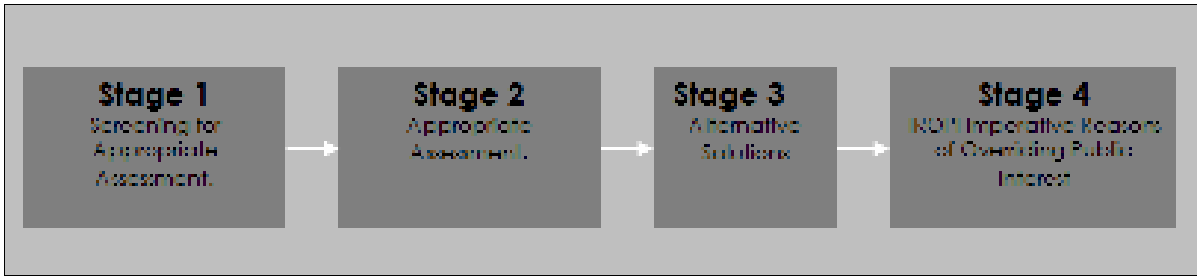
Article 6(3) of Council Directive 92/43/EEC of 21 May 1992 on the *Conservation of Natural Habitats and of Wild Fauna and Flora* (as amended) (hereafter 'the Habitats Directive') requires that, any plan or project not directly connected with or necessary to the management of a designated site, but likely 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. A competent authority (e.g. the OPW or Local Authority) can only agree to a plan or project after having determined that it will not adversely affect the integrity of the site concerned.

The possibility of a significant effect on a designated or "European" site has generated the need for an appropriate assessment to be carried out by the competent authority for the purposes of Article 6(3). A Stage Two Appropriate Assessment is required if it cannot be excluded, on the basis of objective information, that the proposed development, individually or in combination with other plans or projects, will have a significant effect on a European site. The first (Screening) Stage for appropriate assessment operates merely to determine whether a (Stage Two) Appropriate Assessment must be undertaken on the implications of the plan or project for the conservation objectives of relevant European sites.

2.2 Appropriate Assessment Procedure

The assessment requirements of Article 6(3) establish a stage-by-stage approach. This assessment follows the stages outlined in the 2001 European Commission publications "Assessment of plans and projects significantly affecting Natura 2000 sites: methodological

guidance on the provisions of Articles 6(3) and 6(4) of the Habitats Directive 92/43/EEC" (2001) and Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (Draft) Office for Official Publications of the European Communities, Luxembourg (EC, 2015);



The stages are as follows:

Stage One: Screening — the process which identifies any appreciable impacts upon a Natura 2000 site of a project or plan, either alone or in combination with other projects or plans, and considers whether these impacts are likely to be significant, in the absence of mitigation;

Stage Two: Appropriate assessment — the consideration of the impact on the integrity of the Natura 2000 site of the project or plan, either alone or in combination with other projects or plans, with respect to the site's structure and function and its conservation objectives. Additionally, where there are adverse impacts, an assessment of the potential mitigation of those impacts;

Stage Three: Assessment of alternative solutions: The process which examines alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of the Natura 2000 site.

Stage Four: Assessment where no alternative solutions exist and where adverse impacts remain — an assessment of compensatory measures where, in the light of an assessment of imperative reasons of overriding public interest (IROPI), it is deemed that the project or plan should proceed (it is important to note that this guidance does not deal with the assessment of imperative reasons of overriding public interest).

It is the responsibility of the competent authority, in this instance Cork County Council, to make a decision on whether or not this proposed development should be approved, taking into consideration any potential impact upon any Natura 2000 site within its zone of influence.

3. Description of Development

3.1 Overview of project

Irish Water intends to provide a number of new wastewater treatment services for the Untreated Agglomerations Study (UTAS) site at Whitegate / Aghada, County Cork in order to ensure compliance with the Urban Wastewater Treatment Directive (91/271/EEC). A new WWTP, pumping stations and modifications to the existing collection network are proposed. Treated water will be discharged via a new 190m discharge pipeline which will discharge into the coastal waters of Cork Harbour.

With regard to this Screening Report for AA, the study location has been defined by the existing and potential future wastewater collection network of the Whitegate-Aghada agglomeration. The Whitegate-Aghada agglomeration consists of four settlements: Whitegate, Upper Aghada, Lower Aghada and Rostellan. Whitegate, Lower Aghada and Rostellan are all located along the east coast of Cork Harbour and are accessed by the R630. Upper Aghada is located on elevated ground to the northeast of Whitegate and south of Lower Aghada. The town nearest to the study area is Midleton, approximately 14 km northeast from the village of Whitegate.

The National Secondary Route R630 runs from Whitegate through Aghada and Rostellan to Midleton. The villages function as service centres for the surrounding hinterland, and there are numerous commercial, institutional and community facilities present. The area is quite heavily industrialised with the Conoco Philips Oil Refinery and the Bord Gais Eireann Power Plant located in Whitegate, and an ESB electricity generating station located in Lower Aghada. Upper Aghada is located on elevated ground to the northeast of Whitegate and south of Lower Aghada.

There are currently no wastewater treatment facilities in place to serve this agglomeration. Currently these settlements are served by three independent collection systems that discharge untreated sewage to Cork Harbour. There are currently four coastal discharge outfalls (SW001, SW002, SW003 and SW005) and one groundwater discharge (GW004) (Ardnabourkey) within the Whitegate-Aghada agglomeration (Refer to **Figure 1** below).

In order to ensure compliance with the Urban Wastewater Treatment Directive (91/271/EEC), the provision of a number of new wastewater treatment services has been proposed by Irish Water. These services will also be required to provide for sufficient wastewater treatment capacity to cater for the expected future population growth in Whitegate and Aghada. The *East Cork Municipal District Local Area Plan (LAP) 2017* (Cork County Council 2017) identifies Whitegate and Aghada as key villages within the municipality as well as being a Specialist Employment Centre. The LAP document states that *"the existing sewerage scheme is a combined sewerage scheme that currently discharges to the lower harbour at a number of locations though primarily at Long Point"* and that *"provision of a new foul sewer system and a new waste water treatment plant is required prior to any further development taking place in Whitegate and Aghada."*

The Whitegate-Aghada agglomeration is subject to marginal seasonal population fluctuations, with a relatively small number of the properties utilised as summer dwellings. The

agglomeration is part of the electoral division of Midleton and is located in the Cork County Council functional area.

Figure 1: Existing Discharge outfalls

3.2 Existing Situation

Rostellan

Rostellan is the smallest settlement within the agglomeration. The existing collection sewer accommodates the majority of the settlement and discharges untreated wastewater to Cork Harbour at a secondary discharge location SW002- Rostellan. The Radharc na Mara housing estate in Rostellan is served by a private package plant that discharges effluent into the public sewer. The treatment site consists of treatment chambers (below ground) and two control kiosks. The plant is privately maintained. Treated effluent is discharged into the Rostellan public sewer at the junction of Radharc na Mara and the R630.

Lower Aghada

Lower Aghada is a small village located on the R630 between Rostellan and Whitegate. The existing collection sewer in the village only accommodates a small number of residential properties. The flows from this collection sewer are treated by a package treatment plant before being discharged to Cork Harbour at secondary discharge location SW003- Lower Aghada. There is an inlet pumping station and a final effluent pumping station which serve the Lower Aghada private package treatment plant.

Lower Aghada Private Package Plant is a TITAN package plant and is located on a site adjacent to Lower Aghada Harbour. The package plant is located underground and secured with lockable covers. The package treatment plant site includes a stone control building. The package plant serves a small portion of the Lower Aghada village (approximately 30%). The

remainder of the village is believed to be served by septic tanks. Effluent from the package plant is pumped into Cork Harbour via a short outfall.

Whitegate

The village of Whitegate is the largest settlement in the agglomeration. Whitegate is served by a gravity collection network that terminates at a Cork County Council terminal waste water pumping station (WwPS) on the shore of Whitegate Bay. There is a smaller Cork County Council WwPS that serves a number of houses along Whitegate Bay shore. This pumping station (PS) forwards flow into the gravity network.

Untreated sewage is pumped from the terminal WwPS to the primary discharge location SW001 - Whitegate, located in Cork Harbour.

There is one public septic tank in Whitegate. This tank serves the Ardnabourkey Housing Estate. Effluent from this septic tank is discharged into a percolation area at the secondary discharge location GW004 – Ardnabourkey.

Upper Aghada

Upper Aghada is a small village located on elevated land south of Lower Aghada. The sewage network which serves Upper Aghada is connected to the Whitegate sewerage network. All sewage generated from Upper Aghada is conveyed, by gravity, to the Whitegate network.

There is one Cork County Council network pumping station (Cork County Council No. 1) and one Cork County Council terminal pumping station (Cork County Council No. 2) within the sub agglomeration. Both are located along the Whitegate Bay shoreline and both have emergency overflows which discharge into the Bay. There are no package treatment plants in the sub-agglomeration grouping.

Effluent Outfall

There are currently four coastal discharge outfalls (SW001 – 3, and SW005) and one groundwater discharge (GW004) within the Whitegate-Aghada agglomeration.

Rostellan SW002 outfall is noted as a ‘Secondary’ discharge location on the Wastewater Discharge Licence. The outfall is located approximately 15m offshore from a green area and is adjacent to the bridge in the village.

Lower Aghada SW003 outfall is noted as a ‘Secondary’ discharge location on the Wastewater Discharge Licence. The outfall is located approximately 88m from the shoreline to the rear of the Lower Aghada Package Plant and is adjacent to Lower Aghada Pier. Effluent is discharged via a final effluent pumping station.

Whitegate SW001 outfall is noted as the ‘Primary’ discharge location on the Wastewater Discharge Licence and is the discharge point for the Cork County Council No 2 WwPS. The rising main from the pumping station is located along the R630 and then along the access road to the Aghada Power Plant. The discharge location is approximately 80m from the shore at the end of the embankment.

Ardnabourkey GW004 is noted as a ‘Secondary’ discharge location on the Wastewater Discharge Licence. Effluent discharge is into a percolation area in an agricultural field opposite

the Ardnabourkey housing estate. The effluent monitoring location is not identified in the WwDL. No problems with the percolation area have been identified.

CSO (SW005) spills into the adjacent culvert that discharges to the foreshore of Whitegate Bay.

3.3 Proposed Development

The proposed development comprises the construction and operation of a number of new wastewater treatment services in the Whitegate-Aghada agglomeration. As part of the proposed works a three-stage approach was developed in order to identify the preferred treatment and outfall option(s) which include the following main elements:

Rostellan	• Underground wastewater pump station at Thomas Kent Memorial Park, including am underground stormwater storage tank (approx. volume 53m^3). • 1,417m long, 110mm diameter rising main to convey Rostellan Formula 'A' flows to the Lower Aghada network.
Lower Aghada	• Underground wastewater pump station in Lower Aghada, located west of the pier, including an underground stormwater storage tank (approx. 141m^3). • 656m long, 160mm diameter rising main to convey Lower Aghada and Rostellan Formula 'A' flows to the Upper Aghada Network
Whitegate	• Underground wastewater pump station at the Square in Whitegate village, including an underground stormwater storage tank (approx. 240m^3) • 1,765m long, 315mm diameter rising main to convey Rostellan, Lower Aghada, Upper Aghada and Whitegate Formula 'A' flows to the WwTP Site.
WWTP	• New wastewater treatment plant which will provide primary treatment
Outfall	• 880m terrestrial gravity sewer sized to convey Formula 'A' to the outfall launch point. • 295m gravity sea outfall sewer (from high water mark) to convey treated effluent to the proposed discharge point in White Bay.

3.3.1 Construction – General

It is expected that construction will commence in Q2 2021, subject to planning approval. The total duration of all construction works is expected to be 16 months. However, some elements of the works, such as the construction of the individual pumping stations and the laying of the rising mains, will be completed in a considerably shorter duration than others, such as the construction of the WWTP. The main elements to be constructed as part of the proposed development include three separate pumping stations, rising mains connections, gravity mains

connections, gravity sewer connections, the WWTP and the effluent outfall pipeline. An overview of the construction works required for these elements is presented below.

Pumping Stations

Three separate pumping stations will be constructed as part of the proposed development. These will be located at Rostellan, Lower Aghada and Whitegate. Each pumping station will be located entirely below ground except for their control kiosks, a 7.6m high vent stack, paved areas and perimeter fencing to be erected above ground (Lower Aghada).

The pumping stations will consist of a shaft which will be installed as a concrete caisson, while the control kiosks above ground will be constructed from Glass Reinforced Plastic (GRP). Typical open cut excavation methodology will be used. All excavated material generated from the development of the pumping stations will be removed from site.

Dewatering and over pumping are likely to be required at the pumping station works areas close to Cork Harbour such as the Rostellan Pumping Station. No groundwater wells or springs are located within the proposed development area or in its immediate vicinity.

During construction of the proposed Rostellan Pumping Station located in the Thomas Kent Memorial Park, it is proposed that the existing sculpture, commemorative plaque, flag pole, outdoor tables and seats, information sign at the entrance and the bollard and chain fencing be removed and stored safely off-site. They will be put back in their current position (approximate) on the completion of construction works. Topsoil will be reinstated, and grass planted, to ensure that the finished Memorial Park would be similar to the existing Park.

It is possible that some root damage to the existing Sycamore tree located in the memorial park may arise during the construction works. It is intended to retain the tree if possible. An arboriculturist will assess the condition of the tree during and following the completion of site works. The arboriculturist may specify a crown reduction to minimise the risk of wind blow or in worst case scenario may specify removal. It is proposed that three Alder (*Alder glutinosa*) will be planted within the memorial park to ensure that tree cover is maintained.

The existing pumping station at Whitegate village will be decommissioned prior to the commencement of the construction works at this location.

Rising Mains and Gravity Mains Connections and Gravity Sewer Connections

Rising main connections of various lengths will be laid between each of the 3 no. pumping stations and the existing gravity network. Gravity main connections of various lengths will be required in some areas to convey flows. These connections will be laid below existing ground levels and, in most locations, within existing roads. Excavations will be open cut with excavated material generally used for backfill. Any surplus material generated will be removed from site, to a suitably licensed/permitted facility.

Gravity sewer connections of various lengths will be required to divert flows to the new pumping stations and to the effluent outfall launch point. Excavated material generated during the construction of these connections will be returned to the trenches.

WWTP

The elements involved in the construction of the proposed WWTP will include the following:

- Inlet works – required earthworks, formwork and concrete, incoming and outgoing pipework and associated chambers, inlet channel, inlet screen, screenings handling unit, bypass channel with screen and associated control, testing and commissioning equipment.
- Primary settlement and stormwater holding tank – required earthworks, formwork and concrete, incoming and outgoing pipework and associated chambers, pyramidal prefabricated primary settlement tanks, circular stormwater tank, desludging valves and pipework and associated control, testing and commissioning equipment.
- Sea outfall – required earthworks, formwork and concrete, pipework and diffuser.
- Sludge handling – required earthworks, formwork and concrete, incoming and outgoing pipework, associated chambers, and associated testing and commissioning equipment.
- Miscellaneous – land purchase (agricultural), site clearance, road to site, road within site, green paladin fencing, control kiosks, welfare facilities, manholes, watermain to site, watermain within site and water supply break tank.

Effluent Outfall Pipeline

The WWTP at Whitegate will include an outfall pipeline to White Bay which will discharge treated effluent from the proposed WWTP site. The outfall will consist of a terrestrial section and a marine section. The terrestrial section will be constructed along a public road, through agricultural fields and along White Bay beach. The length of the marine section will extend approximately 295m beyond the high-water mark and approximately 190m beyond the low water mark.

Following the construction of the outfall pipeline, its endpoint will be fitted with a diffuser, while the seabed around the pipeline will be protected with a woven Gabion mattress.

Overview

A permanent marine outfall is proposed to discharge the treated effluent from the proposed WwTP in Ballytigeen TD to White Bay. The proposed outfall will extend approximately 295m beyond the high water mark and approx. 190m beyond the low water mark discharging in a water depth range of between 4.3m and 8m during a typical spring tide. The outfall has been designed as a 315mm diameter HDPE pipe terminating at an 80mm diameter diffuser port. A 40m wide pipe corridor (i.e. 20m either side of the outfall) is included in the consent application, to allow flexibility for construction activities required within this corridor.

It is envisaged that the terrestrial section of the outfall will be constructed via open cut excavation. The access road to White bay beach and the beach itself is currently used by the public. Whilst every effort will be made to maintain public access to the beach, it would be necessary to temporarily close the beach at White Bay to facilitate the safe construction of the outfall. It is envisaged that closure would be required for a full summer season

There are several methods by which the marine section of the sea outfall can be constructed, and the contractor's methodology will ultimately depend on their available plant and equipment

as well as their previous experience with laying marine outfalls. The contractor is responsible for determining which method is most appropriate. The likely methods to construct the sea outfall are presented in the following sections, based on current practice and site constraints/characteristics. These are:

- Horizontal directional drilling method;
- Float and flood method; and
- Bottom-pull method.

Construction of the outfall will include works from both the land and sea. It is expected that several vessels may be required during the construction of the outfall and that diving support is likely to be required at times. The outfall area is calculated to be 1.16 Hectares. Refer to **Figure 2**.

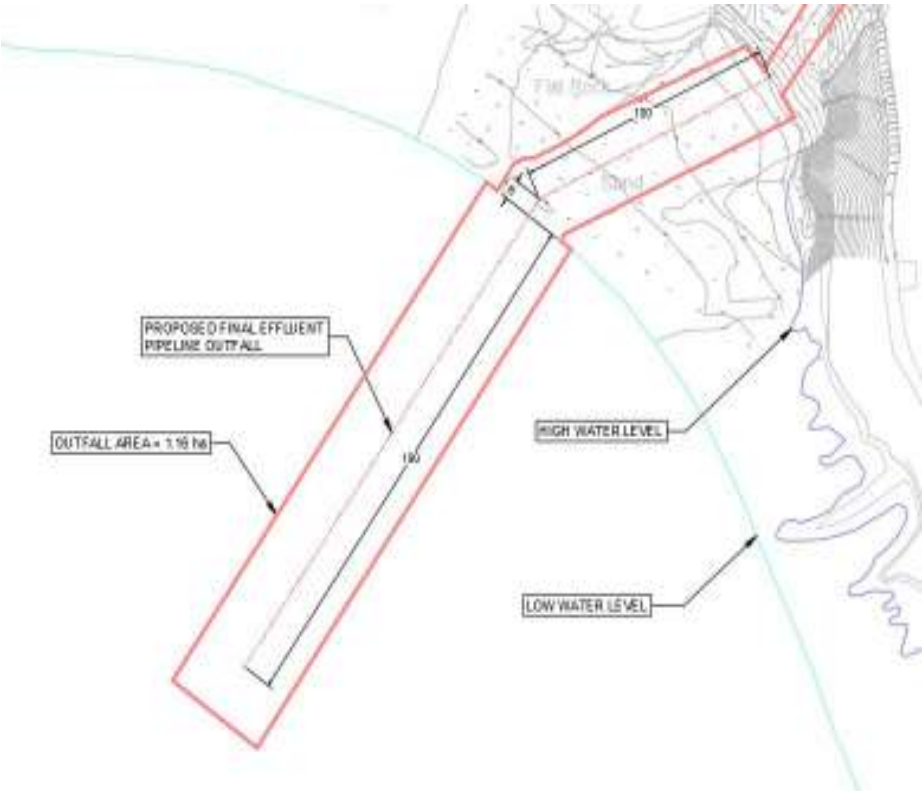


Figure 2. Proposed Marine Outfall

Horizontal Directional Drilling Method

Construction of the outfall using the horizontal directional drilling method would comprise three phases: pilot boring, pre-reaming and pipe positioning, each of which are illustrated in **Figure 3**.

It is assumed that the HDD process would occur from a drilling rig located close to the beach (as this is the reasonable worst case for the purpose of the assessment).

It is noted that this method would not involve any change in the seabed geometry during construction or operation (as the pipeline would be tunnelled) and therefore there is no need to install scour protection along the route of the outfall.

It should be noted that the contractor may locate the rig on a suitable barge or jack-up platform (i.e. on the seaward end of the outfall). In this case, pilot boring would be undertaken from the seaward end of the outfall towards the landward end and thus geotechnical risks associated with exiting the seabed would be avoided. This would avoid loose sand material at the exit point and improve support to the hole at the seaward end of the outfall (as the hole can be supported with casing from the platform). The reaming and pull-back stages would be undertaken from the landward side of the outfall.

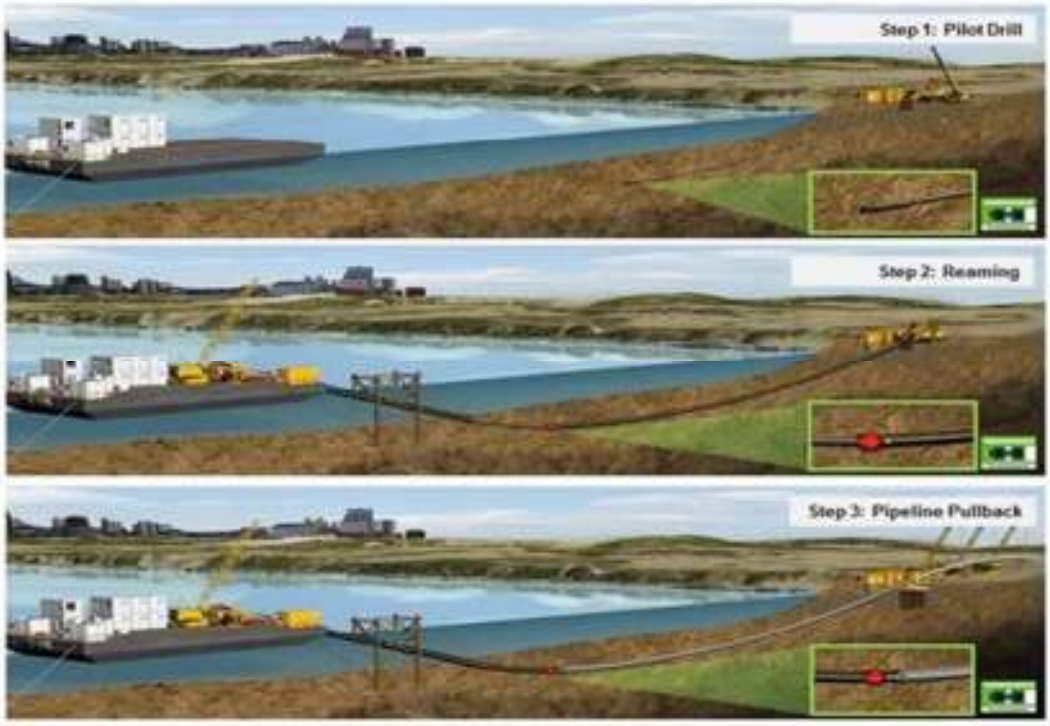


Figure 3: Typical HDD process for a sea outfall (Source: Stevens[1])

Flood and Float Method

The use of the float and flood method would require the formation of trenches and the placement of suitable material to support and protect the sea outfall once it is in position. Refer to **Figure 4** for an overview of the float and float method.

<u>Trenching</u>

Prior to the pipeline installation, the trench (in which the outfall pipe is to be laid) would be excavated along the route of the long sea outfall. The seabed material would be removed to achieve the required depth and slope of the trench (which would be set out as part of the detailed design).

This trenching would be carried out through the use of barges that would be either anchored to the sea bed or jacked up using steel piles. The dredging equipment that would be used would depend on the contractor, but it is envisaged that either backhoe dredgers or grab

[1] Stevens (2015) Trenchless solutions for sewer networks and sea outfalls. Available from: https://www.imesa.org.za/wp-content/uploads/2015/11/Paper-10-Trenchless-solutions-for-wewer-networks-and-sea-outfalls-Frank-Stevens.pdf [Accessed 30 October 2019]

dredgers would be used. It is anticipated that the excavated material would be left to the side of the trench, with some material being re-used as filter material in the trench, when the pipe has been laid and the rest naturally dispersing locally within the water column.

The Bedding Layer

Once the seabed material has been removed and the trench has been formed, the bedding stone would be placed along the bottom of the trench to form the bedding layer.

At this stage, it is anticipated that the bedding layer would be imported material brought to the site from local quarries on trucks or by sea. The laying of the bedding layer along the bottom of the trench is likely to be carried out through the use of barges, however the exact procedure would be confirmed by the contractor.

Laying the Outfall Pipeline

The float and flood method, also known to as the 'S-Bend method' would involve floating and towing the entire outfall pipeline into position on the surface of the sea and the subsequent lowering down of the pipe into the trench as illustrated in **Figure 4**.

Sections of the outfall pipe would be assembled on land (within the WwTP site) and readied for moving to the water. The pipe and diffuser would be sealed temporarily while full of air, which provides the buoyancy necessary to float.

The pipeline would then be floated into the water using barges, which would tow and manoeuvre the outfall into position. The lowering operation would be achieved by replacing the air with water, which causes the outfall to sink into position. The rate of submergence would be controlled by the rate of air release. Additional weight would be added where required (e.g. by using concrete ballast collars) in order to provide the negative buoyancy needed to sink the pipeline and place it in the bottom of the trench.

Backfilling the Trench

Once the outfall pipe is laid in place, backfill material would be placed in the trench to protect and stabilise the outfall pipelines. First, a filter layer would be installed to surround the outfall pipe, followed by a rock armour layer to provide protection on the sea bed.

The exact procedure and depths of these backfill layers would depend on the equipment available from the contractor along with programme and cost considerations, however it is anticipated that this would be undertaken from the barges.

Diffuser Assembly

Once the sea outfall pipe has been laid, the diffuser would be assembled at the seaward end of the outfall. The diffuser would be prefabricated on land and placed on the seabed by barge as one complete unit. The exact procedure and depths of backfill required would depend on the equipment available from the contractor along with programme and cost considerations, however it is anticipated that this would be undertaken from the barges.

Scour Protection

To ensure against potential long-term effect from scour on the seabed, suitable protection of the pipeline is required. A concrete mattress layer up to approximately 300mm thickness is proposed and would be finished at existing bed level so as to avoid any scour problems once operational.

Figure 4: Float and Flood method of installing the outfalls (Source: WRC[2])

Bottom Pull Method

The use of the bottom-pull method would, in a similar manner to the flood and float method, require the formation of trenches and the placement of suitable bedding material to support and protect the positioned pipeline as described for the flood and float method above. The trenching, placement of the bedding layer, construction of the culvert, backfilling of the trench, the diffuser assembly and scour protection procedures would also be described for the flood and float method above. Laying of the outfall would be undertaken as described below.

Laying the outfall pipeline

The bottom-pull method would involve joining and pulling sections of the outfall pipeline towards the sea by using a barge. The pipes would be pulled into place by the barge as illustrated in **Figure 5**.

Sections of the outfall pipe would be arranged on land (within the WwTP site) and readied for placing on rollers. The rollers would be aligned with the route of the outfall and the location of the revetment crossing/culvert to ensure that the correct pipe alignment is achieved. Sections of the pipe would be joined in sequence to make pipe strings that could be placed onto the rollers.
The number and length of the pipe strings would be determined by the contractor based on the space that is made available within the WwTP site.

The pipe strings would be pulled by winches mounted on a barge anchored offshore in a stepped process. The first pipe string would be pulled towards the sea then the next string would be moved across the rollers and joined to the first string at the tie-in position. This procedure would be repeated until all the strings have been joined and the outfall pipe has been laid in position. Following the completion of pulling, the culvert (i.e. the interface between the outfall and the revetment) would be installed. The culvert would be installed thereafter in a similar to manner to the method proposed for the flood and float option.

[2] WRC (1990) Design guide for marine treatment schemes: Volumes I - IV

Figure 5: Bottom pull method of installing the outfalls (Source: CIRIA[3])

3.3.2 Construction – Specific details

<u>Proposed Rostellan Wastewater Pump Station</u>

It is proposed to construct an underground wastewater pumping station within Thomas Kent Memorial Park (**Photographs 1 & 2**), just north of the regional road R630. Above ground elements include a new access gate from the public road at the northern end of the Memorial Park, a proposed paved area and entrance gate, control kiosks and a proposed 7.6m high vent stack which will be designed in the form of a streetlight pole.

The habitat to be affected by the proposed development consists primarily of amenity grassland. The park is regularly mown to maintain very short swards. The park is bordered by a small concrete wall to the south and a similar sized stone wall to the east. A metal post and chain fence runs along the western and northern boundary of the park just before the land slopes steeply towards the estuary.

[3] CIRIA (1996) Sea outfalls - construction, inspection and repair: Report 159.

Photographs 1 & 2. Proposed location of the Rostellan terminal wastewater pumping station.

Proposed Rising Main to Connect Rostellan Pump Station to Lower Aghada

A proposed 1,417 long 110mm diameter rising main will convey flows from the proposed Rostellan pump station to the proposed pump station in Lower Aghada (**Photographs 3 &4**). The rising main will be constructed under the public road or in the verge alongside the public road. The R630 is composed of tarmacadam and is between 10-15m wide. The road is largely flanked by amenity grassland. A concrete/tarmac foot path 'the Peoples Path' runs along the northern side of the road, providing an amenity walkway for the local community. The road is at a minimum distance of 2m from the boundary of Cork Harbour.

Photographs 3 & 4. Shows the R630 where it is proposed to bury a 1417-metre-long rising main, which will connect the proposed Rostellan Pump Station to the proposed Lower Aghada Pump Station.

Proposed Lower Aghada Wastewater Pump Station

It is proposed to construct an underground wastewater pump station in land located to the west of the junction leading to the pier in Lower Aghada. Associated control kiosks, proposed vent stack, paved area and perimeter fencing would be erected above ground.

The proposed control kiosks would be located at the eastern side of the site, along the boundary with the public road. The existing gate access location would be used for access to the new pump station. The proposed 7.6m vent stack would be constructed and designed in the form of a pole for lighting.

The proposed wastewater pumping station site lies within a largely greenfield site at the south western corner of the Lower Aghada pier (**Photographs 5 & 6**). The site is dominated by low value grassland.

A tarmacadam drive runs through the site for approximately 35m. The drive provides access to a TITAN package plant which is located underground and secured with lockable covers. The site also includes a modern stone control building.

The northern and eastern boundaries are formed by the working pier. Mud flats to the east of the pier are largely screened from the development site by a coastal wall, signage and parked cars. The western boundary of the site is formed by the estuary. The southern boundary is a small vegetated embankment.

Photographs 5 & 6. A greenfield site for the proposed Lower Aghada pumping station along with the existing plant and control building.

<u>Proposed Rising Main to Connect Lower Aghada Pump Station to a Gravity Sewer in Aghada</u>

A proposed 656-metre-long rising main will convey flows from the proposed Lower Aghada pump station to an existing sewer in the Upper Aghada sewerage network (**Photographs 7 & 8).** The rising main will be approximately 160mm in diameter and will be laid approximately 1.2m below existing ground level.

The rising main is to be laid within existing local road L3658. The road is bounded on both sides by a number of private dwellings with associated boundary hedgerows and treelines and private residential estates with small areas of amenity grassland along with associated concrete footpaths and modern stone walls.

Proposed upgrade works to the existing sewerage system will comprise replacement of c. 143 m of 150 mm diameter section of sewer with a 225 mm diameter sewer, in the townlands of Aghada and Curragh.

Photographs 7 & 8. The local road L3658, in which the rising mains is to be buried. Note the area of bedrock which the road dissects.

Proposed Whitegate Wastewater Pump Station

The proposed underground wastewater pump station will be located in the Whitegate village square, in public open space in close proximity to the main street (**Photographs 9 & 10**). The proposed associated control kiosks, 7.6m high vent stack and paced areas would be erected above ground.

The site is currently a public open space area and since the new pump station would be underground, the space will continue to function as public open space with a paved and grass finish after construction.

The site lays in close proximity to Whitegate bay, where a small 2-foot breeze block wall separates a pedestrian footpath from the extensive mud shore habitat within the bay, some 4-5m below the level of the village.

Photographs 9 & 10. Showing Whitegate village in close proximity to Whitegate along with the regional road R630.

Proposed Glebe Manor (Ardnabourkey) Gravity Mains

A 530-metre-long 225 mm diameter gravity main will be laid in front of Glebe Manor residential estate (**Photographs 11 & 12**). The main will be laid approximately 1.2 m below existing ground level. The full extent of the gravity main will be laid within the existing road network. The road, L3636, is composed of tarmacadam and slopes in a westerly direction. Treelines, narrow bands of broadleaved woodland, hedgerows and some vegetated earthbanks occur along the road. Species noted include Oak, Ash, Beech, Sycamore, Hawthorn and Elm.

Photographs 11 & 12. Shows the Glebe Manor estate and the L3646 road network bounded by man-made, hedgerow, treeline and woodland habitats.

<u>Proposed Rising Main to Whitegate Pump Station to the Propose WwTP</u>

A proposed 1,765-metre-long rising main will be laid from the Whitegate PS to the proposed WwTP. The rising main will be 315mm in diameter and will be laid approximately 1.2m below existing ground level. All of the rising main will be laid within existing roads and laneways (**Photographs 13 & 14**).

Photograph 13 & 14. The R630 and the laneway in which the proposed rising main connecting the proposed Whitegate PS to the proposed WWTP, is to be laid.

Wastewater Treatment Plant

The location of the proposed WWTP site is within an agricultural field of a recently planted monoculture of rye-grass that has been planted as part of an arable rotation (**Photograph 15**). The section in which the treatment plant is to be constructed slopes gently in a west, north-west direction. The site is bounded to the north by a hedgerow.

The overall WwTP will include;

- Inlet Works

- Required earthworks, formwork and concrete. Incoming, outgoing pipework and associated chambers. Inlet channel, Inlet screen. Screenings handling unit. Bypass channel with screen. Associated control equipment, testing and commissioning.

- Primary Settlement
  - Required earthworks, formwork and concrete. Incoming, outgoing pipework and associated chambers. 3 no. pyramidal prefabricated primary settlement tanks. Desludging valves and pipework. Associated control equipment, testing and commissioning.
- Sludge Handling
  - Picket Fence Thickener (PFT). Required earthworks, formwork and concrete. Incoming, outgoing pipework, associated chambers, associated control equipment, testing and commissioning.
- Storm Handling
  - Circular stormwater holding tank. Required earthworks, formwork and concrete. Incoming, outgoing pipework and associated chambers. Storm tank mixer. Testing and commissioning.
- Miscellaneous
  - Site clearance. Road within the site. Watermain to the site and within the site. Water supply break tank. Kiosks and welfare facility.
- Pumping Stations
  - Sludge pumping station. Storm return pumping station. Wastewater booster set. Final effluent washwater booster set. Control kiosks.

Photograph 15. Location of proposed WWTP.

<u>Effluent Outfall</u>

Effluent will be discharged into Cork Harbour via a gravity system. The effluent outfall consists of a terrestrial section and a marine section (**Photograph 16**). The terrestrial gravity main will be approximately 880m long. This pipeline will be laid mostly in agricultural fields. The marine

outfall length extends to c. 190 metres from the low water mark and 295m from the high water mark. This pipeline will not be located within the Cork Harbour SPA.

Photograph 16. Location of final effluent pipeline.

3.3.3 Operation

Following the completion of the construction works, wastewater treatment services at Whitegate/Aghada will be upgraded. This will ensure that the practice of discharging untreated sewage into Cork Harbour is ceased while it will also provide sufficient wastewater treatment capacity to cater for the expected future population growth in Whitegate-Aghada.

The majority of the proposed development is located below ground. The exceptions to this will be the WWTP building and associated tanks/structures as well as the control kiosks associated with each pumping station.

There will be some emissions from the proposed development during the operational phase. Treated effluent will be discharged to Cork Harbour from the proposed marine treated outfall linked to the WWTP, while dilute storm water discharges will also overflow from the pumping stations to receiving waters on an infrequent basis. Noise emissions from the proposed pumping stations and WWTP will also occur during the operational phase. However, these will be minimal as the main pumping equipment associated with the pumping stations will be submerged underground, while no air blowers, typically high noise generating equipment, are proposed at the WWTP.

Dispersion modelling was carried out during the design process, the results of which are included in the "*Whitegate Aghada Far Field Modelling*" report, included in this planning application.

The report concluded the following:

"*Our results indicate that the 95%ile concentrations of both E. Coli and Intestinal Enterococci as well as the 50%ile concentrations of the other modelled nutrients are increased in the*

vicinity of the proposed outfall location. The increases however do not lead to the EQS at any of the designated EPA Surface Water Regulation monitoring points to be exceeded. It has also been demonstrated that the Whitebay shoreline still retains excellent water quality with the proposed outfall in place. The proposed scheme therefore does not cause any of the EQS thresholds in Cork harbour to be exceeded and the discharges from the proposed WwTP for Whitegate are in full compliance with the relevant EU water regulations".

Detailed drawings are included in **Appendix 2 of this report**.

4. Screening

This Stage 1 Screening Assessment determines whether a stage 2 Natura Impact Statement is necessary. It does this by assessing, in view of best scientific knowledge, if the development, individually or in combination with another plan or project is likely to have a significant effect on the Natura 2000 site.

The aim of the screening assessment is to:

- Provide information on and assess the potential for the proposed development to significantly impact on Natura 2000 Sites (also known as European sites).
- Determine whether the proposed development is directly connected with, or necessary to the conservation management of any Natura 2000 sites.
- Determine whether the proposed development, alone or in combination with other projects, is likely to have significant effects on Natura 2000 sites in view of their conservation objectives.

4.1 Desktop Study

A desktop review facilitates the identification of the baseline ecological conditions and key ecological issues relating to Natura 2000 sites and facilitates an evaluation assessment of potential in-combination impacts. Sources of information used for this report include reports prepared for the Whitegate-Aghada area and information from statutory and non-statutory bodies. The following sources of information and relevant documentation were utilised:

- National Parks & Wildlife Service (NPWS) - www.npws.ie
- Environmental Protection Agency (EPA) – www.epa.ie
- National Biodiversity Data Centre – www.biodiversityireland.ie
- County Cork Biodiversity Action Plan 2009-2014 (Cork County Council, 2009);
- Bat Conservation Ireland – http://www.batconservationireland.org
- Birdwatch Ireland - http://www.birdwatchireland.ie/
- British Trust for Ornithology (BTO)-www.BTO.ie
- Scottish Natural Heritage Guidelines (Winter Bird Survey Method), 2014
- Best Practice Guidance for Habitat Survey and Mapping (Heritage Council, 2011)
- Guidelines for Assessment of Ecological Impacts of National Road Schemes (National Roads Authority, 2009).
- Invasive Species Survey Untreated Agglomerations Study – Cork Project (Aghada/Whitegate, DixonBrosnan 2020
- Winter Bird Surveys Untreated Agglomerations Study – Cork Project Aghada/Whitegate, DixonBrosnan, 2020

4.2 Study Area and Zone of Influence

Natura 2000 sites (European sites) are only at risk from significant effects where a source-pathway-receptor link exists between a proposed development and a Natura 2000 site(s). This can take the form of a direct impact (e.g. where the proposed development and/or associated construction works are located within the boundary of the Natura 2000 site(s) or an indirect impact where impacts outside of the Natura 2000 site(s) affect ecological receptors within (e.g. impacts to water quality which can affect riparian habitats at a distance from the impact source).

In the case of the proposed development, it is clear that the project is not directly connected with or necessary to, the conservation management of any of the European sites. There will be no direct impacts within Natura 2000 sites.

It is often considered appropriate to examine all European sites within 15 km as a starting point for this type of assessment. Therefore as a starting point, all European sites within 15 km of the proposed development were examined Each of these Natura 2000 sites were examined against the potential zone of influence of the proposed development in terms of source-pathway-receptor linkage and associated risks in order to determine which sites may experience potential impacts.

Considering the Natura 2000 sites present in the region, their Qualifying Interests (QIs) and conservation objectives, and any potential impact pathways that could link those sites to the proposed development area, a distance of 15km was considered appropriate to encompass all Natura 2000 sites potentially within the Zone of Influence (ZoI) of the proposed development .

Thus, any appreciable direct, indirect or cumulative impacts which could arise from the proposed development in relation to the designated sites within this zone were considered.

4.3 Field Study

Site inspections were carried out on 18th of January 2018 and 20th February 2018 and 11th December 2019 to identify the habitats, flora and fauna present at the site. The surveys assessed the potential for all Qualifying Interests (QIs)/ Special Conservation Interests (SCIs) of European sites and third schedule invasive species to occur within the proposed site.

5. Natura 2000 sites

5.1 Designated sites within a 15 km radius

In accordance with the European Commission Methodological Guidance (EC2001), a list of Natura 2000 Sites that can be potentially affected by the proposed development has been compiled. All candidate SACs (cSAC) and SPA sites potentially affected by the proposed development have been identified, see **Table 1 and Figure 6**.

Table 1. Designated sites and their location relative to the proposed works area.

Natura 2000 sites within the Zone of Influence (ZoI)	Code	Distance at the closest point (km)
Special Area of Conservation (SAC)		
Great Island Channel	001058	4.0 km north. The Great Island Channel SAC is located within the greater Cork Harbour area and discharges of wastewater and surface water from the proposed development could potentially impact on QI habitats within the SAC. Therefore, a source-pathway-receptor link exists between the source (wastewater collection network of the Whitegate-Aghada agglomeration) and the receptor (Great Island Channel SAC).
Special Protection Area (SPA)		
Cork Harbour	004030	0km - the proposed Rostellan Network pumping station site and sections of the proposed rising main to Lower Aghada network are within the boundary of the SPA. A source-pathway-receptor link exists between the source (wastewater collection network of the Whitegate-Aghada agglomeration) and the receptor (Cork Harbour SPA).
Ballycotton Bay	004022	13.3km E. Given the distance and lack of hydrological or other connection, there is no potential for the proposed development to impact on SCI species or habitats of this site.

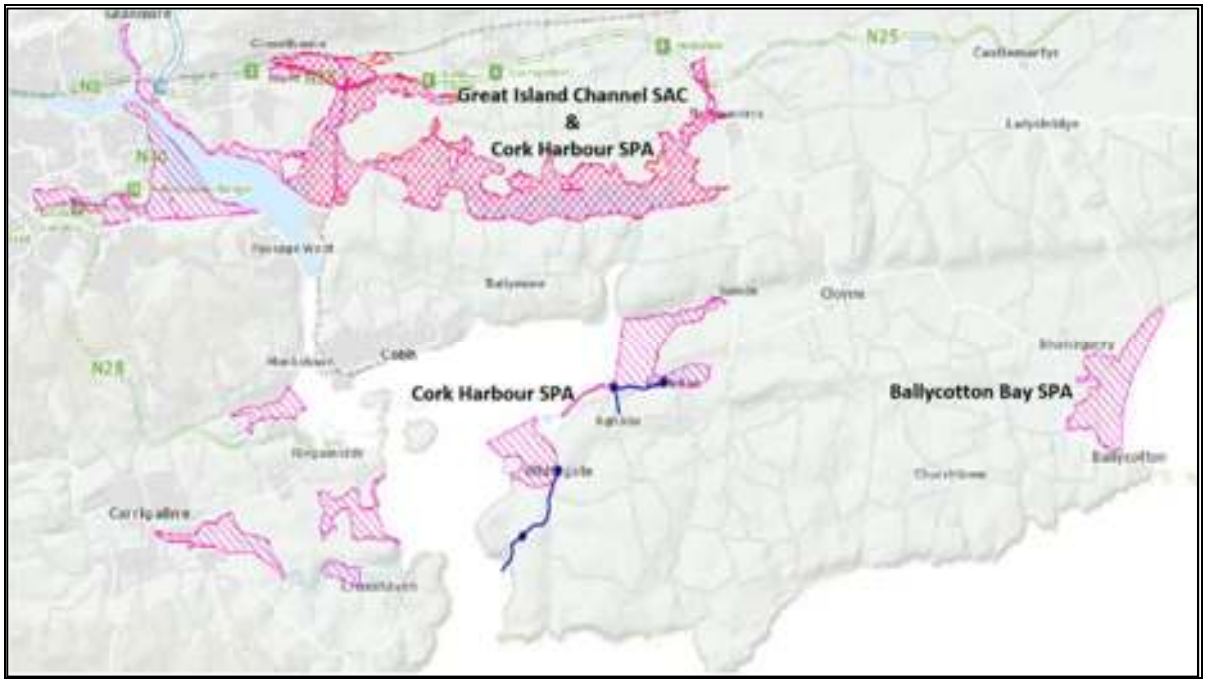


Figure 6. Proposed development site (Blue lines) in relation to surrounding Natura 2000 sites.

After an initial review of all Natura 2000 sites it was considered that no pathway exists by which the proposed development could impact upon the following Natura 2000 site due to the distance involved and the lack of hydraulic or any other connections:

- Ballycotton Bay SPA

Thus, the potential impacts on the following Natura 2000 sites, which are considered of relevance for the purposes of this report, are the Cork Harbour SPA and the Great Island Channel SAC.

Overall, the Cork Harbour SPA and Great Island Channel SAC are of conservation significance for the occurrence of good examples of habitats that are listed on Annex I of the E.U. Habitats Directive and species recognised under the E.U. Birds Directive as being of international importance. Further relevant information on Qualifying Interests and Conservation Objectives for the Cork Harbour SPA and Great Island Channel SAC is provided below, with full site synopses for these sites included in **Appendix 1** of this AA screening.

5.2 Cork Harbour SPA

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* sp. Cordgrass (*Spartina* sp.) 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, Redbreasted Merganser, Oystercatcher, Golden Plover, Grey Plover, Lapwing, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Greenshank, Blackheaded 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), Bartailed Godwit (233), Curlew (2,237) and Greenshank (46). The Shelduck population is the largest in the country (over 10% of national total). Other species using the site include Mute Swan (38), Whooper Swan (5), Pochard (72), Gadwall (6), Tufted Duck (64), Goldeneye (21), Coot (53), Ringed Plover (73), Knot (26) and Turnstone (113). Cork Harbour is an important site for gulls in winter and autumn, especially Black-headed Gull (3,640), Common Gull (1,562) and Lesser Black-backed Gull (783), all of which occur in numbers of national importance. Little Egret and Mediterranean Gull, two species which have recently colonised Ireland, also occur at this site.

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

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

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

A full site synopsis for the Cork Harbour SPA is included as **Appendix 1** of this report.

5.3 Great Island Channel

The Great Island Channel stretches from Little Island to Midleton, with its southern boundary being formed by Great Island. 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 site is an integral part of Cork Harbour which is a wetland of international importance for the birds it supports.

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.

A full site synopsis for the Great Island Channel SAC is included as **Appendix 1** of this report.

5.4 Natura 2000 sites – Features of interests and conservation objectives.

The EU Habitats Directive contains a list of habitats (Annex I) and species (Annex II) for which SACs must be established by Member States. Similarly, the EU Birds Directive contains lists of important bird species (Annex I) and other migratory bird species for which SPAs must be established. Those that are known to occur at a site are referred to as 'qualifying interests' and are listed in the Natura 2000 forms which are lodged with the EU Commission by each Member State. A 'qualifying interest' is one of the factors (such as the species or habitat that is present) for which the site merits designation. The National Parks and Wildlife Service (NPWS) are responsible for the designation of SACs and SPAs in Ireland.

The detailed conservation objectives for these sites are detailed in:

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

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

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. These habitats and species are listed in the Habitats and Birds Directives and Special Areas of Conservation and Special Protection Areas are designated to afford protection to the most vulnerable of them. These two designations are collectively known as the Natura 2000 network. European and national legislation places a collective obligation on Ireland and its citizens to maintain at favourable conservation status sites designated as Special Areas of Conservation and Special Protection Areas. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

The maintenance of habitats and species within Natura 2000 sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level. Favourable conservation status of a habitat is achieved when its natural range, and area it covers within that range, is stable or increasing, and the ecological factors that are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and the conservation status of its typical species is favourable.

The species listed as Special Conservation Interests (SCIs) for the Cork Harbour SPA and Qualifying Interests (QIs) for the Great Island Channel SAC are included in **Table 2** and **Table 3.**

Table 2. Special Conservation Interests (SCIs) for the Cork Harbour SPA

Species code	Species	Scientific name	Conservation objective
A004	Little Grebe	*Tachybaptus ruficollis*	Maintain
A005	Great Crested Grebe	*Podiceps cristatus*	Maintain
A017	Cormorant	*Phalacrocorax carbo*	Maintain
A028	Grey Heron	*Ardea cinereal*	Maintain
A048	Shelduck	*Tadorna tadorna*	Maintain
A050	Wigeon	*Anas Penelope*	Maintain
A052	Teal	*Anas crecca*	Maintain
A054	Pintail	*Anas acuta*	Maintain
A056	Shoveler	*Anas clypeata*	Maintain
A069	Red-breasted Merganser	*Mergus serrator*	Maintain
A130	Oystercatcher	*Haematopus ostralegus*	Maintain
A140	Golden Plover	*Pluvialis apricaria*	Maintain
A141	Grey Plover	*Pluvialis squatarola*	Maintain
A142	Lapwing	*Vanellus vanellus*	Maintain
A149	Dunlin	*Calidris alpina*	Maintain
A156	Black-tailed Godwit	*Limosa limosa*	Maintain
A157	Bar-tailed Godwit	*Limosa lapponica*	Maintain
A160	Curlew	*Numenius arquata*	Maintain
A162	Redshank	*Tringa totanus*	Maintain
A179	Black-headed Gull	*Chroicocephalus ridibundus*	Maintain
A182	Common Gull	*Larus canus*	Maintain

Species code	Species	Scientific name	Conservation objective
A183	Lesser Black-backed Gull	*Larus fuscus*	Maintain
A193	Common Tern	*Sterna hirundo*	Maintain
A999	Wetland and Waterbirds		Maintain

Maintain = Restore favourable conservation condition

Table 3. Qualifying Interests for the Great Island Channel SAC

Species code	Species	Conservation objective
1140	Mudflats and sandflats not covered by seawater at low tide	Maintain
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	Restore

Restore = Restore favourable conservation condition, Maintain = Restore favourable conservation condition

5.5 River Basin Management Plan for Ireland 2018 – 2021 (2nd Cycle)

The Water Framework Directive (WFD) sets out the environmental objectives which are required to be met through the process of river basin management planning and implementation of those plans. Specific objectives are set out for surface water, groundwater and protected areas. The challenges that must be overcome in order to achieve those objectives are very significant. Therefore, a key purpose of the River Basin Management Plan (RBMP) is to set out priorities and ensure that implementation is guided by these priorities.

The second-cycle RBMP aims to build on the progress made during the first cycle. Key measures during the first cycle included the licensing of urban waste-water discharges (with an associated investment in urban waste-water treatment) and the implementation of the Nitrates Action Programme (Good Agricultural Practice Regulations). The former measure has resulted in significant progress in terms both of compliance levels and of the impact of urban waste-water on water quality. The latter provides a considerable environmental baseline which all Irish farmers must achieve and has resulted in improving trends in the level of nitrates and phosphates in rivers and groundwater. It is acknowledged, however, that sufficient progress has not been made in developing and implementing supporting measures during the first cycle.

Overall, the RBMP assesses the quality of water in Ireland and presents detailed scientific characterisation of our water bodies. The characterisation process also takes into account wider water quality considerations, such as the special water-quality requirements of protected areas. The characterisation process identifies those water bodies that are *At Risk* of not meeting the objectives of the WFD, and the process also identifies the significant pressures causing this risk. Based on an assessment of risk and pressures, a programme of measures has been developed to address the identified pressures and work towards achieving the required objectives for water quality and protected areas. Data relating to the waterbodies within the study area is provided in **Table 4**.

Treated wastewater from the proposed development site will ultimately be discharged to an area defined as outer Cork Harbour and works will take place in proximity to an area defined as Cork Harbour.

Table 4. Water Framework Directive Data – Relevant data

Catchment: Lee, Cork Harbour and Youghal Bay (Code 19) – 2nd Cycle

This catchment includes the area drained by the River Lee and all streams entering tidal water in Cork Harbour and Youghal Bay and between Knockaverry and Templebreedy Battery, Co. Cork, draining a total area of 2,153km². The largest urban centre in the catchment is Cork City. The other main urban centres in this catchment are Ballincollig, Macroom, Carrigaline, Crosshaven, Blarney, Glanmire, Midleton, Carrigtohill, Cobh, Passage West and Belvelly. The total population of the catchment is approximately 328,854 with a population density of 153 people per km².

Several small coastal rivers drain the area to the southeast of Cork Harbour and the area at the eastern extreme of the catchment is drained by the Womanagh River which flows into the sea on the western side of Youghal Bay.

The Lee-Cork Harbour catchment comprises 18 sub-catchments with 92 river water bodies, three lakes, 13 transitional, six coastal water bodies and 16 groundwater bodies. There are five heavily modified and no artificial water bodies in the catchment.

The catchment assessment notes that:

- Twenty-two river water bodies and all three lake water bodies in the catchment are At Risk of not meeting their water quality objectives. Measures will be needed in these water bodies to improve the water quality outcomes. Of these the waterbodies the Owennacurra 040 river waterbody (i.e. section of the Owenacurra River in proximity to the proposed development) is one of the rivers at risk due to its Moderate biological status.
- There are eight Transitional and coastal water bodies in the catchment that are At Risk of not meeting their water quality objectives. Measures will be needed in these water bodies to improve the water quality outcomes. Of these the Owenacurra Estuary is listed as one.
- Outer Cork Harbour water quality was defined as *Good* in the period from 2013-2018. Water quality in Cork Harbour was defined as *Moderate* in the same period.
- There are five Special Areas of Conservation (SACs) in the catchment, not all of which have water quality and/or quantity conservation objectives for their qualifying interests. All three waterbodies relevant to this project listed below are within protected areas.
- Diffuse urban pressures, caused, for example, by misconnections, leaking sewers and runoff from paved and unpaved areas, have been identified as a significant pressure in five river water bodies; which includes the Owennacurra 040 river waterbody and five transitional water bodies, which includes the Owenacurra Estuary.
- The Owennacurra Estuary/North Channel is designated a Nutrient Sensitive Area (NSA).

Alteration of hydro-morphological (or physical) conditions is one of the most significant issues in rivers in the Lee-Cork Harbour. This includes inputs of excess fine sediment and alteration of the morphology of the river channel, which in turn alter habitat conditions. This can occur because of, for example, implementing river and field drainage schemes, forestry activities, animal access, and discharge from quarries.

Waterbodies relevant to the proposed project

Waterbody	Status	Risk
Cork Harbour	Moderate	Review

Outer Cork Harbour	Good	Review

Source: wfdireland map system & www.catchments.ie

6. Potential Impacts

The potential impacts associated with the proposed development are discussed in the following section with respect to their likelihood to have significant impacts on Natura 2000 sites. As part of the assessment direct, indirect and cumulative impacts were considered. Direct impacts refer to habitat loss or fragmentation arising from land-take requirements for development. Indirect and secondary impacts do not have a straight-line route between cause and effect, and it is potentially more challenging to ensure that all the possible indirect impacts of the project/plan - in combination with other plans and projects have been established.

Based on an assessment of the proposed project and its location in relation to Natura 2000 sites the following potential impacts were identified as follows:

- Impact from loss of habitat
- Impacts from noise, visual vibration and disturbance
- Impacts on water quality and aquatic ecology
- Impact from spread of invasive species
- Cumulative Impacts

6.1 Potential impacts from loss of habitat

Cork Harbour SPA

The footprint of the Rostellan Network pumping station and sections of the associated rising main to Lower Aghada are located within the Cork Harbour SPA. Therefore, construction works could potentially result in habitat loss within the SPA.

Further investigation is required to determine if habitat loss during the construction phase of the proposed development will have a significant impact on the conservation objectives of the Cork Harbour SPA.

Great Island Channel SAC

The proposed works area is not located within the Great Island Channel SAC and therefore there will be no direct habitat loss as a result of the proposed development. Given the dilution provided in Cork Harbour, the distance from qualifying habitats and the robust nature of these habitats, any minor increases in silt in surface run-off, minor spills of hydrocarbons or other chemicals during construction or operation will not have a significant effect on qualifying habitats within the Great Island SAC. Similarly changes in organic and nutrient loading, which will be reduced during the operational phase of the development, will have a beneficial effect on the qualifying habitats within the Great Island Channel SAC.

6.2 Potential impacts from noise and visual disturbance

Cork Harbour SPA

There is potential for the duration of the construction phase to cause both visual and noise disturbance to waterbirds which are SCI's for the Cork Harbour SPA. Further investigation is required to examine the potential for disturbance or displacement of qualifying species within the SPA boundary.

Great Island Channel SAC

Disturbance of birds or other wildlife is not relevant to the Great Island Channel SAC which has been designated on the basis of habitats.

6.3 Potential impacts on water quality

Cork Harbour SPA

Surface water runoff during the construction phase could potentially be contaminated with silt, hydrocarbons or other chemicals. A reduction in organic and nutrient loading to an estuary during the operational phase of the development may have various consequences for the ecology of the estuarine system. Further investigation is required to examine the potential impact of changes in water quality during construction and operation on SCI species within Cork Harbour SPA.

Great Island Channel SAC

Given the dilution provided in Cork Harbour, the distance from qualifying habitats and the robust nature of these habitats, any minor increases in silt in surface run-off, minor spills of hydrocarbons or other chemicals during construction or operation will not have a significant effect on qualifying habitats within the Great Island SAC. Similarly changes in organic and nutrient loading during the operational phase of the development will have no significant impact on the qualifying habitats within the Great Island Channel SAC.

6.4 Impacts from spread of invasive species

Cork Harbour SPA

Initial site walkovers surveys noted Japanese Knotweed was present within the proposed works area. Although unlikely there is potential during the construction phase of the proposed works for Japanese Knotweed or other invasive species to be spread to habitats within the Cork Harbour SPA. Further investigation is required to determine the potential impact of the spread of invasive species within Cork Harbour SPA.

Great Island Channel SAC

Due to the distance involved there is no potential for Japanese Knotweed or other invasive species to spread to the Great Island Channel SAC as a result of the proposed development. Therefore, no significant impacts from invasive species on the Great Island Channel SAC will occur.

6.5 Cumulative Impacts

Cumulative impacts refer to a series of individual impacts that may, in combination, produce a significant impact. The underlying intention of this in combination provision is to take account of cumulative impacts from existing or proposed plans and projects, and these will often only occur over time. There are a large number of active facilities and proposed developments within the Cork Harbour area which were taken into consideration as part of the assessment process. These include the following:

- ESB Aghada Power Station/BGE Power Station – Approximately 760m northeast of the proposed development is the ESB Power Station, at Whitegate.
- Bord Gáis Eireann (BGE) Power Station Whitegate - Approximately 1.13km from the proposed development site
- Cork Lower Harbour Main Drainage Scheme - Irish Water has completed construction of a new municipal sewage treatment plant at Shanbally, Ringaskiddy, for the Cork Lower Harbour Main Drainage Scheme. The plant has been operational since December 2016.
- Haulbowline Island Remediation Project – The Ispat steel manufacturing facility, located adjacent to the naval base on Haulbowline Island, ceased operation in 2001 and the buildings on the site have been demolished. Remediation works are complete and plans are currently being progressed to open the park once a lease has been finalised.
- Spike Island – there is a masterplan in place since 2012 but no planned/permitted projects. Increased boat traffic to Spike Island and increased activity on the island, which could potentially impact on bird populations.
- Residential Developments
- Ferry and Cruise Ship Business.

A precautionary approach has also been adopted in relation to the appraisal of whether the proposed development in combination with other developments is likely to have significant impacts on the Cork Harbour SPA. As a result, cumulative impacts on Cork Harbour SPA cannot be ruled out without further investigation.

Given the distance from the proposed development site and the robust nature of the qualifying habitats, no cumulative impacts on the Great Island Channel SAC are predicted to occur.

6.6 Screening of qualifying interests

Potential impacts via habitat loss, noise and visual disturbance during the construction phase, changes in water quality, the spread of invasive species and cumulative impacts to the Cork Harbour SPA have been identified. No potential impacts on the Great Island Channel SAC have been identified. Further assessment with regard to the SCI's for the Cork Harbour SPA is provided in **Table 5**. This outlines the potential impacts of the proposed development on SCI's and determines if these should be subject to a Stage 2 Appropriate Assessment.

Table 5. Screening Conclusions

Natura 2000 site	Qualifying Interest* (*Screened in QI'/SCI In Bold)	Potential Impacts	Screened In/Out
Cork Harbour SPA	**Little Grebe (*Tachybaptus ruficollis*) [A004]** **Great Crested Grebe (*Podiceps cristatus*) [A005]** **Cormorant (*Phalacrocorax carbo*) [A017]** **Grey Heron (*Ardea cinerea*) [A028]** **Shelduck (*Tadorna tadorna*) [A048]** **Wigeon (*Anas penelope*) [A050]** **Teal (*Anas crecca*) [A052]** **Pintail (*Anas acuta*) [A054]** **Shoveler (*Anas clypeata*) [A056]**	Potential impacts on SCI's may arise from noise and disturbance during the construction phase, changes in water quality, the spread of invasive species and cumulative impacts. Further investigation is required to determine if the proposed development will have an effect on the conservation objectives of the Cork Harbour SPA.	Screened In

Natura 2000 site	Qualifying Interest* (*Screened in QI'/SCI In Bold)	Potential Impacts	Screened In/Out
	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 alpine*) [A149]** **Black-tailed Godwit (*Limosa limosa*) [A156]** **Curlew (*Numenius arquata*) [A160]** **Redshank (*Tringa totanus*) [A162]**		

Natura 2000 site	Qualifying Interest* (*Screened in QI'/SCI In Bold)	Potential Impacts	Screened In/Out
	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]**		
Ballycotton Bay SPA	Teal (*Anas crecca*) [A052] Ringed Plover (*Charadrius hiaticula*) [A137] Golden Plover (*Pluvialis apricaria*) [A140] Grey Plover (*Pluvialis squatarola*) [A141]	Given the distance and lack of hydrological or other connection, there is no potential for the proposed development to impact on QI species or habitats	Screened out

Natura 2000 site	Qualifying Interest* (*Screened in QI'/SCI In Bold)	Potential Impacts	Screened In/Out
	Lapwing (*Vanellus vanellus*) [A142] Black-tailed Godwit (*Limosa limosa*) [A156] Bar-tailed Godwit (*Limosa lapponica*) [A157] Curlew (*Numenius arquata*) [A160] Turnstone (*Arenaria interpres*) [A169] Common Gull (*Larus canus*) [A182] Lesser Black-backed Gull (*Larus fuscus*) [A183] Wetland and Waterbirds [A999]		
Great Island Channel SAC	Mudflats and sandflats not covered by seawater at low tide [1140]	The proposed development is not located within the Great Island Channel SAC and therefore the proposed works will not impact directly on the Annex I habitats.	Screened out

Natura 2000 site	Qualifying Interest* (*Screened in QI'/SCI In Bold)	Potential Impacts	Screened In/Out
	Atlantic salt meadows (*Glauco-Puccinellietalia* *maritimae*) [1330]	Given the dilution provided in Cork Harbour, the distance from qualifying habitats and the robust nature of these habitats, any minor increases in silt in surface run-off, minor spills of hydrocarbons or other chemicals during construction or will not have a significant effect on qualifying habitats within the Great Island SAC. Similarly changes in organic and nutrient loading during the operational phase of the development will have no significant effect on the qualifying habitats within the Great Island Channel SAC. No impacts from the spread of invasive species will occur. Therefore, no potential impacts on these habitats have been identified	

6. Screening conclusion and statement

After an initial review of all Natura 2000 sites within 15 km of the proposed development site, it was considered that “no pathway” exists by which the proposed development could impact upon on the following Natura 2000 site:

- Ballycotton Bay SPA (Site Code 004022)

The following Natura 2000 site has been screened out as no potential for impacts exist as outlined in **Table 5**.

- Great Island SAC (Site Code 001058)

There is no potential for the proposed development to impact on these Natura 2000 sites and therefore they can be screened out for Stage 2 Appropriate Assessment.

However, a number of SCI’s for the Cork Harbour SPA have been screened in for further assessment as significant effects cannot be ruled out in the absence of mitigation (refer to **Table 5** for more details). This Natura 2000 site and its relevant SCIs are listed below:

- Cork Harbour SPA (Site Code 004030): Little Grebe (*Tachybaptus ruficollis*) [A004], Great Crested Grebe (Podiceps cristatus) [A005], Cormorant (*Phalacrocorax carbo*) [A017], Grey Heron (*Ardea cinerea*) [A028], Shelduck (*Tadorna tadorna*) [A048], Wigeon (*Anas penelope*) [A050], Teal (*Anas crecca*) [A052], Pintail (*Anas acuta*) [A054], Shoveler (*Anas clypeata*) [A056], Red-breasted Merganser (*Mergus serrator*) [A069], Oystercatcher (*Haematopus ostralegus*) [A130], Golden Plover (*Pluvialis apricaria*) [A140], , rey 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] and Wetland and Waterbirds [A999]

Therefore, in line with a precautionary approach, a Stage 2 Appropriate Assessment of the proposed development is considered necessary in respect of these SCI’s for the Cork Harbour SPA.

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Appendix 1. Site Synopses

Cork Harbour SPA Site Code: 004030

Cork Harbour is a large, sheltered bay system, with several river estuaries - principally those of the Rivers Lee, Douglas, Owenboy and Owennacurra. The SPA site comprises most of the main intertidal areas of Cork Harbour, including all of the North Channel, the Douglas River Estuary, inner Lough Mahon, Monkstown Creek, Lough Beg, the Owenboy River Estuary, Whitegate Bay, Ringabella Creek and the Rostellan and Poulnabibe inlets. Owing to the sheltered conditions, the intertidal flats are often muddy in character. These muds support a range of macro-invertebrates, notably *Macoma balthica, Scrobicularia plana, Hydrobia ulvae, Nepthys hombergi, Nereis diversicolor* and *Corophium volutator*. Green algae species occur on the flats, especially Ulva spp. Cordgrass (*Spartina* spp.) has colonised the intertidal flats in places, especially where good shelter exists, such as at Rossleague and Belvelly in the North Channel. Salt marshes are scattered through the site and these provide high tide roosts for the birds. Some shallow bay water is included in the site. Rostellan Lake is a small brackish lake that is used by swans throughout the winter. The site also includes some marginal wet grassland areas used by feeding and roosting birds. The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Little Grebe, Great Crested Grebe, Cormorant, Grey Heron, Shelduck, Wigeon, Teal, Mallard, Pintail, Shoveler, Redbreasted Merganser, Oystercatcher, Golden Plover, Grey Plover, Lapwing, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Greenshank, Blackheaded 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), Bartailed Godwit (233), Curlew (2,237) and Greenshank (46). The Shelduck population is the largest in the country (over 10% of national total). Other species using the site include Mute Swan (38), Whooper Swan (5), Pochard (72), Gadwall (6), Tufted Duck (64), Goldeneye (21), Coot (53), Ringed Plover (73), Knot (26) and Turnstone (113). Cork Harbour is an important site for gulls in winter and autumn, especially Black-headed Gull (3,640), Common Gull (1,562) and Lesser Black-backed Gull (783), all of which occur in numbers of national importance. Little Egret and Mediterranean Gull, two species which have recently colonised Ireland, also occur at this site. A range of passage waders occurs regularly in autumn, including such species as Ruff (5-10), Spotted Redshank (1-5) and Green Sandpiper (1-5). Numbers vary between years and usually a few of each of these species over-winter. Cork Harbour has a nationally important breeding colony of Common Tern (102 pairs in 1995). The birds have nested in Cork Harbour since about 1970, and since 1983 on various artificial structures, notably derelict steel barges and

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

Great Island Channel SAC Site Code: 001058

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

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

[1140] Tidal Mudflats and Sandflats

[1330] Atlantic Salt Meadows

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

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

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

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

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

While the main land use within the site is aquaculture (oyster farming), the greatest threats to its conservation significance come from road works, infilling, sewage outflows and possible marina developments. The site is of major importance for the two habitats listed on Annex I of the E.U. Habitats Directive, as well as for its important numbers of wintering waders and wildfowl. It also supports a good invertebrate fauna.