



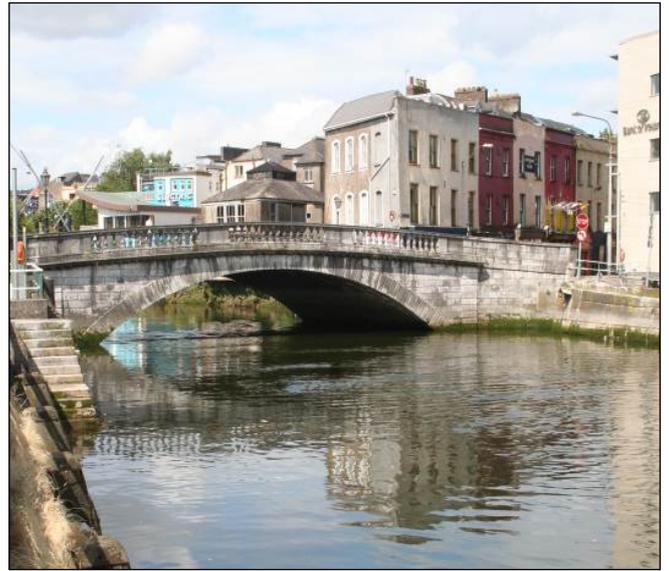
# MORRISON'S ISLAND PUBLIC REALM AND FLOOD DEFENCE PROJECT



## NATURA IMPACT STATEMENT

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# 1 INTRODUCTION & BACKGROUND TO PROJECT

## 1.1 INTRODUCTION

Ryan Hanley in partnership with McCarthy Keville O'Sullivan has been commissioned by Cork City Council to prepare a Natura Impact Statement for the Morrison's Island Public Realm and Flood Defence Project. The Natura Impact Statement assesses site investigation works, construction works and the operational stage of the proposed public realm scheme. The purpose of the NIS is to inform the Appropriate Assessment (AA) process which is carried out by the competent authority (i.e. An Bord Pleanála). Appropriate Assessment is an assessment of the potential effects of a plan or project, in combination with other plans or projects, on a European Site (Natura 2000 site).

## 1.2 BACKGROUND

As part of a Part 8 Planning Submission, RH-MKOS carried out an Appropriate Assessment Screening Report for the project, as required by the Habitats Directive. This Screening Report concluded that there is no potential for significant effect on European Sites as a result of the project. Since the time of the AA Screening Report publication, recent case law, in particular CJEU case C-323/17 (People over Wind and Peter Sweetman v Coillte) which has highlighted issues in Screening for Appropriate Assessment, in particular what constitutes Screening with regard to mitigation. In light of this court decision and using the precautionary principle with regard potential for impact on European Sites, Cork City Council have determined that a Natura Impact Statement should be completed to inform the Appropriate Assessment by assessing the potential impact on all downstream European Sites in the absence of mitigation and in combination with other plans and projects.

The proposed Morrison's Island Public Realm and Flood Defence Project includes design measures to carry out public realm improvements while also alleviating flooding in the area. This Report takes account of these design works in full as part of its impact assessment. The scheme proposes to enhance the public realm along Fr. Mathew Quay and Morrison's Quay, creating a more pedestrian friendly space, and incorporating open plaza spaces at Parnell Plaza and Trinity Bridge, as well as incorporating flood defence works. The proposed work involves raising the existing ground levels and providing an effective continuous flood defence along the left (north) bank of the South Channel of the River Lee at Morrison's Island. The required flood defence levels have been established as an output of the Lower Lee Flood Relief Scheme (which has built on the Lee Catchment Flood Risk Assessment and Management Study (CFRAMS)).

The defence level corresponds to the modelled 1:200-year combined event (tidal region), and 1:100-year flow (fluvial zone) taking account of climate change modelling and freeboard.

The key features for the proposed Morrison's Island scheme will broadly comprise the following:

- Alteration of the area layout for traffic and pedestrians;
- Widening of Trinity Bridge, boardwalk at Union Quay and viewing platform at the eastern end of Morrison's Quay;
- Flood defence works;
- Landscaping works;
- Regrading works;
- Drainage works, including the construction of pumping stations;
- Diversion of services and utilities;

- Targeted site investigations (if required).

### 1.3 THE REQUIREMENT FOR APPROPRIATE ASSESSMENT

The requirement for Appropriate Assessment is set out in the EU Habitats Directive (92/43/EEC) in Article 6 (3) which states:

*“Any plan or project not directly connected with or necessary to the management of the [Natura 2000] site but likely to have a significant effect thereon, either individually or in combination with other plans and projects, shall be subjected to appropriate assessment of its implications for the site in view of the site’s conservation objectives.”*

The Habitats Directive is transposed in Ireland by the European Communities (Birds and Natural Habitats) Regulations, 2011 (consolidating the European Communities (Natural Habitats) Regulations 1997 to 2005 and the European Communities (Birds and Natural Habitats) (Control of Recreational Activities) Regulations 2010), as well as addressing transposition failures identified in recent CJEU Judgements) (hereafter referred to as the Habitats Regulations) and the Planning and Development Act 2000 - 2018.

### 1.4 THE AIM OF THIS REPORT

Appropriate Assessment is required to assess the proposed Project as identified above with regard to impact on European Sites. It will identify whether the existing and proposed project is likely to have significant effects on European Sites in view of best scientific knowledge and the conservation objectives of the sites. European Sites are those identified as sites of European Community importance, designated as Special Areas of Conservation (SAC) under the Habitats Directive or as Special Protection Areas (SPA) under the Birds Directive.

This report follows the Department of the Environment, Heritage and Local Government ‘Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities’ (DoEHLG, 2010). Furthermore, the report has regard for recent European Court of Justice Decisions (CJEU) with regard to Article 6(3) of the Habitats Directive, in particular, case C-323/17 People Over Wind and Peter Sweetman v Coillte.

## 2 THE APPROPRIATE ASSESSMENT PROCESS

### 2.1 GUIDANCE

Article 6(3) of the EU Habitats Directive (92/43/EEC) defines the requirement for Appropriate Assessment of certain plans and projects. In order to inform the requirements of this Natura Impact Statement, the following guidance documents have been referred to:

- DoEHLG Circular NPWS 1/10 & PSSP 2/10 Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities.
- DoEHLG (2010) Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities. Department of the Environmental Heritage and Local Government.
- European Commission (2018) Managing Natura 2000 sites: the provisions of Article 6 of the ‘Habitats’ Directive 92/43/EEC.
- European Commission (2000) Communication from the Commission on the Precautionary Principle. Office for Official Publications of the European Communities, Luxembourg. European Commission.

- 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
- European Commission (2006) Nature and biodiversity cases: Ruling of the European Court of Justice. Office for Official Publications of the European Communities, Luxembourg.
- European Commission (2007) Guidance document on Article 6(4) of the 'Habitats Directive' 92/49/EEC; clarification of the concepts of: Alternative solutions, Imperative reasons of overriding public interest, Compensatory Measures, Overall Coherence, Opinion of the Commission.
- European Commission (2013). Interpretation Manual of European Union Habitats. Version EUR 28. European Commission
- European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. No.477 of 2011).
- Ryan Hanley (2014a) Stage 1: Appropriate Assessment Screening Methodology for the Maintenance of Arterial Drainage Schemes. Prepared by Ryan Hanley on behalf of the Office of Public Works.
- Ryan Hanley (2014b) OPW Drainage Maintenance Categories Source » Pathway » Receptor Chains for Appropriate Assessment. Prepared by Ryan Hanley on behalf of the Office of Public Works

## 2.2 STAGES OF ARTICLE 6 ASSESSMENT

The European Commission's guidance promotes a staged process, as set out below, the need for each being dependent upon the outcomes of the preceding stage.

- (1) Screening
- (2) Appropriate Assessment
- (3) Assessment of Alternative Solutions
- (4) Assessment where no alternative solutions remain and where adverse impacts remain.
  - The "IROPI test" (Imperative Reasons of Over-riding Public Interest) and compensatory measures.

The Habitats Directive promotes a hierarchy of avoidance, mitigation and compensatory measures.

Stage 1 of the process is intended to identify whether the project is 'likely to have a significant effect' upon a European site, referred to as 'Screening for Appropriate Assessment'.

If the screening process identifies effects to be significant, potentially significant or uncertain, or if the screening process becomes overly complicated, then the process must proceed to Stage 2 (AA). Screening is undertaken without the inclusion of mitigation, unless potential impacts clearly can be avoided through the modification or redesign of the plan or project, in which case the screening process is repeated on the altered plan or project. The greatest level of evidence and justification will be needed in circumstances when the process ends at screening stage on grounds of no impact.

Section 177U of the Planning and Development Act 2010 states that; *"the competent authority shall determine that an appropriate assessment of the proposed development is not required if it can be excluded, on the basis of objective information, that the proposed development, individually or in combination with other plans or projects, will not have a significant effect on a European site."*

Stage 2 of the process considers any potential impacts in greater detail including whether mitigation measures are required. Recent case law with regard to screening and NIS emphasizes that term mitigation can be taken to include any measures intended to avoid or reduce the harmful effects of a project, which may in some cases be interpreted as best practice and pollution control measures thereby triggering the requirement for NIS.

If an adverse impact upon the site's integrity cannot be ruled out, then Stage 3 will need to be undertaken to assess whether alternative solutions exist. If no alternatives exist that have a lesser effect upon the Natura 2000 site/s in question, the project can only be implemented if there are 'imperative reasons of overriding public interest', as detailed in Article 6(4). In essence, the work at Stage 1 will determine whether further stages of the process are required.

### 3 DESCRIPTION OF THE PROPOSED PROJECT

Cork City Council (CCC) has had a long-term objective of enhancing the south facing quays along the north bank of the River Lee South Channel. These quays are currently dominated by parking and are underutilised as a city centre river amenity. The Morrison's Island Public Realm and Flood Defence Project proposes to carry out a public realm improvement scheme for Morrison's Quay and Fr. Mathew Quay (together Morrison's Island). Works comprise of a combination of flood walls, regrading of road and pavement sections, creation of civic amenity space and other minor works. The Works will provide greater protection against high frequency tidal events and will raise the threshold of tidal flooding for Morrison's Island from circa 1 in 2 years to 1 in 10 years. The Morrison's Island Public Realm project will provide greater protection against high frequency tidal events and will raise the threshold of flooding. The design of the proposed works is adaptable for future climate change and also includes an allowance for freeboard.

The proposed works are detailed on the scheme drawings in Appendix I (MOR-0001 to MOR-6000) and are described as follows:

#### 3.1 PROPOSED WORKS

##### 3.1.1 SITE INVESTIGATION

Preliminary and detailed site investigations have been carried out to inform the design process. However further targeted site investigation may be required in advance of construction to confirm the detailed design.

##### 3.1.2 FLOOD DEFENCE WORKS

The proposed flood defence works comprise the following:

- Significant remedial works to the existing quay walls, including cleaning, repointing and grouting;
- Construction of reinforced concrete backing wall behind existing quay walls;
- Grouting of foundation below RC backing wall;
- Provision of demountable Flood Gates at Trinity Bridge and Parnell Plaza;
- Extension (i.e. raising) of existing limestone steps to 3.5mOD;
- Construction of two pumping stations.

##### 3.1.3 DRAINAGE AND PUMPING STATIONS

In the study area, surface water drainage is primarily overland and discharges to the River Lee through discrete regular outfalls through the quay walls. The construction of flood defence walls and associated ground regrading will require a new surface water drainage system to allow surface water to be discharged at all times. To ensure that pluvial flooding is not worsened on the dry side of flood defences during fluvial/tidal flooding, new 'collector' drains and pumping stations will need to be constructed to safely discharge surface water during a flood event.

Pumping stations will incorporate permanent submersible pumps in underground wet wells with only control kiosks as above ground elements. The greatest impact of these pumping stations is therefore likely to be in terms of traffic and noise restrictions during construction as they will require deep excavations of up to 5m in depth. Wet wells will typically be rectangular with dimensions 3m long by 3.5m in width. Two No. pumping stations are proposed for Morrison's Island at Fr. Mathews Quay near Trinity Bridge and on the west side of the plaza. The sites of pumping stations have been chosen to minimise disruption during construction and

to provide access locations for maintenance that will require minimum future traffic management. See MOR-6000 (Appendix I) for Pumping Station Locations.

### 3.1.4 DESIGN LAYOUT AND LANDSCAPING WORKS

Public Realm works include the following:

- Changing the traffic flow system within Morrison's Island to one-way only;
- Pedestrianisation of the eastern end of Morrison's Quay and provision of an enhanced plaza area at eastern end of Morrison's Quay;
- High quality paved pedestrian riverside walkway with a minimum width of 3m with associated landscaping;
- Existing right-angle parking along the quays will be removed and replaced with parallel parking;
- Widening of Trinity Bridge, boardwalk at Union Quay and viewing platform at the eastern end of Morrison's Quay.

### 3.1.5 REGRADING

It is proposed to raise existing ground levels by re-grading the roads and footpaths in order to reduce the relative height of the flood defence wall relative to the proposed ground levels on the dry side. This will increase the social amenity relationship with the river. Such regrading is generally limited to changes in elevation of less than 1m.

### 3.1.6 LANDSCAPING - STREETScape

The proposed works includes the provision of high quality street furniture, lighting and tree planting/soft landscaping. See Appendix MOR-1000 to MOR-1004 and MOR-5006 for further details. The following tree planting/soft landscaping works will be provided:

- Liquid Amber trees proposed at Plaza along south Mall.
- *Betula ermanii* trees proposed at the Plaza end of Morrison's Quay.
- *Platanus x hispanica* tree proposed at the at the church adjacent to Trinity bridge.
- *Crataegus prunifolia* small trees proposed for use in the plaza planters.

## 3.2 ANTICIPATED CONSTRUCTION METHODS

### 3.2.1 PRE-CONSTRUCTION WORKS

The construction works have been preceded by geotechnical investigations. It is anticipated that a small amount of additional geotechnical works may be required which will consist of a mixture of shell and augur boreholes, cable percussive boreholes, rotary drilled boreholes, trial pits and slit trenches at the locations of the proposed structures.

In addition, it is proposed that archaeological investigation works including testing and any follow-on resolution works will be undertaken prior to the main works contract commencing on site.

Pre-construction works will also include certain diversion works of services and utilities, including electricity, gas, telecommunications, watermains and other sanitary services. Due to the nature of some of the diversions a number of these service diversions will only be possible during the main construction works.

### 3.2.2 MAIN CONSTRUCTION WORKS

The main construction will involve the excavation and placement of material for the construction of walls, pump stations and as well as the haulage of material and importation of materials to complete the flood scheme. Material will be required for the following:

- Structures – the construction of /flood walls and parapets, quay wall remedial works;
- The diversion and construction of utilities and services;
- Road works – sub base and base construction, bituminous pavement surfacing;
- Ancillary reinstatement roadworks including the installation of public lighting, signage and road marking; and
- Piling works.

#### Quay Wall Remedial Works

The remediation of existing quay flood defence walls is likely to be carried out by traditional methods comprising the following activities:

- Isolation of works area, including traffic management;
- Scaffolding and temporary propping to be erected on the wet site of the quay wall as required. Where scaffolding is installed, it will typically stand on the river bed (assuming that adequate bearing is available). It will be restrained laterally by temporary anchors into the quay wall where possible, and/or temporary anchor blocks sitting on the quay.
- Construction to commence with excavation of existing backfill material for foundations. Construction of the new reinforced concrete backing wall is to be carried out in short lengths (circa 5m).
- Blinding of formation, fixing of reinforcement, placing of formwork, placing of concrete, and stripping of formwork.
- Addition of security fencing if required.
- Concrete backing wall to be poured in short lifts to minimise pressure on the existing quay wall.
- Proposed new quay wall back drainage to be installed. Backfill to top of existing quay wall.
- Face of all joints to be raked out, cleaned and repointed by hand. Face of existing quay to be thoroughly cleaned with high pressure water jetting with all dirt and marine growth to be completely removed.
- Grouting of foundation zone and existing quay wall to begin. The wall is to be gravity grouted initially, through holes drilled c/c 2m down through the centre of the wall.
- When the wall gravity grouting has set, the wall and foundation zone to be pressure grouted holes drilled c/c 1m through the body of the wall, down into the foundation zone. Galvanised Reinforcement stitching bars to be installed and grouted into cored hole.
- Reinstatement of works area.

Works to the Quay walls may result in the removal of some of the existing timber fenders. It is the intention to retain as many of the existing timber fender piles as possible. However, it should be noted:

- At Trinity Bridge and Parnell Plaza, fenders will need to be removed due to clashes with the proposed structures. These fenders are identified on the Planning Drawings.
- It is further noted that the remainder of the existing fenders are generally in very poor condition, with many in state of partial collapse. To ensure that that proposed remedial works to the face of the existing quay wall can proceed without undue risk to health and safety, the condition of the

fenders will be further assessed during the detailed design stage and any element which are deemed to be at high risk of collapse will be identified for removal.

### **Flood Defence Walls Construction**

The construction of the reinforced concrete flood defence walls is likely to be carried out by traditional methods comprising the following activities:

- Remove existing railings and parapet walls.
- Dowel connections to be drilled in to RC backing wall to ensure connection of Flood wall to backing wall.
- Tie back rebar to be fixed.
- Shuttering for base of L-Wall to be fixed.
- Base of L-Wall poured.
- Upstand of L-wall poured.
- Granite Columns to be erected.

The plan area/ extent of in stream work is indicated on the working areas shown on the scheme drawings.

### **Pumping Stations**

The footprint of the pumping station is set out. The excavation will take place to the required depth. Sheet piling will likely be required in order to facilitate construction of deep excavations. Excavated material unsuitable for use as backfill material will be disposed of to an approved waste management facility. Lean mix concrete blinding will be placed, followed by formwork and steel fixing. Once concrete has been poured and has cured, the formwork will be stripped and the area outside the pumping station will be backfilled. Excavations in paved areas will be backfilled with granular material and reinstated as proposed. Mechanical and electrical fit out of pumping stations will take place following backfilling.

### **Drainage Works**

The drains/ surface water sewers will be constructed by one of two methods as follows:

- Where the trench does not overlap with the footprint of the excavation for the flood wall, the trench of the drainage pipe will be set out. All existing road and footpaths will be excavated before works in a given area begins. The trench will then be excavated to the required depth. Excavated material unsuitable for use as backfill material will be disposed of to an approved waste management facility. Pipe bedding will be placed, followed by the pipe and granular pipe surround. Trenches in roads will be backfilled with granular material or lean mix concrete, depending on its location in accordance with the Guidelines for Managing Openings in Public Roads.
- Where the trench overlaps with the footprint of the excavation for the flood wall, the steps outlined above will be taken. The order of excavation, pipelaying, backfilling and reinstatement will depend on the sequence of construction of the retaining wall and the proximity of the proposed retaining wall to the pipe trench. The pipe may be laid and partially backfilling prior to pouring of concrete for the wall. Pipelaying may alternatively take place following pouring of the base of the wall or following construction of the wall.

### **In River Works at Parnell Plaza and Trinity Bridge**

As part of the works required to Trinity Bridge, the Union Quay Boardwalk and Parnell Plaza, instream support works are required. The piling works consist of the supply and installation of approximately 17 no. piles into the river bed. Piling and column construction will be carried out in two stages.

- Stage 1 Steel tubular piles will be installed in the river channel (possibly from a barge)
- Stage 2 Steel columns will be fixed to the piles (possibly by setting in a cement grout).

### **Layout/Finishes**

The following landscaping works are proposed:

- Place new surface drainage channel with gullies;
- Road surface to be laid;
- General finishes to structures, junctions, traffic lights, signage, road markings, bike share station etc.;
- Installation of stainless steel railing and cable system;
- Road opened to full traffic.

## **3.3 CONSTRUCTION PROGRAMME AND SEQUENCING OF PROPOSED WORKS**

The construction works will be preceded by a small number of geotechnical and archaeological investigations as necessary. The construction works themselves will be subject to the following programme constraints:

- To avoid impacting on bird nesting sites, the vegetation removal within the defined working area will not be carried out during the peak bird nesting season of March to August (inclusive) prior to the onset of works.
- Christmas non-working time is from the beginning of the second week of December to the end of the second week of January.

It is proposed to undertake the work in three phases as follows:

- Phase 1 – 2.5 months (Father Matthews Quay)
- Phase 2 – 4.0 months (Morrison's Quay adjacent to Cork College of Commerce)
- Phase 3 – 5.5 months (Morrison's Quay)

## **4 DESCRIPTION OF THE EXISTING ENVIRONMENT**

### **4.1 DESCRIPTION OF THE BASELINE ENVIRONMENT**

The proposed Morrison's Island Public Realm Project is located along the River Lee in the City Centre in a built up urbanised environment. The site is made up of made ground including roadways, buildings and footpaths with occasional street trees. The River Lee at Morrison's Island is influenced by the tide. Field Assessment of the study area have been carried out between June 2013 and November 2018.

#### **4.1.1 HABITATS AND FLORA**

The study area encompasses the channel, floodplain and immediate surrounding areas of the River Lee at Morrison's Island as well as downstream of the proposed Project. The ecological character of the study area is described below in terms of the habitats (as per Fossitt, 2000. A Guide to Habitats in Ireland) present within and adjacent to the footprint of the proposed works.

### **Old Sea Walls (CCI) and Tidal Channel (CW2)**

The lower reaches of the River Lee can be considered a tidal channel between Wellington Bridge and the North Channel at the Gillabey Rock on the south Channel to the Port of Cork where the channels converge. The brackish water permits the presence of Channel Wrack and abundant *Ulva* sp. that attach to the tidal walls along the water line. The upper walls at Morrison's Island have localised patches of terrestrial species including occasional Ivy Leaved toadflax (*Cymbalaria muralis*) and frequent Pellitory-of-the-wall (*Parietaria Judaica*) with infrequent sprigs of Common Whitlow Grass (*Erophila verna*). Mexican fleabane (*Erigeron karvinskianus*), a mid-nineteenth century introduction, was frequent near Parliament Bridge on Father Mathew Quay and George's Quay. A second introduced fleabane species, Bilbao Fleabane (*Coniza bilbaoana*) was recorded infrequently, also emerging from the quay walls. Hemlock Water dropwort (*Oenanthe crocata*) was present near the high-water mark emerging from crevices.

The old wharf timbers adjoining Union Quay support the non-native species Greater Quaking-Grass (*Briza maxima*). The quay steps on Union Quay supported the non-native sprawling plant Mind-your-own-business (*Soleirolia soleirolii*).

### **Treelines**

Planted treelines along the South Mall are present within the study area. Treelines in the city centre have been planted within the concrete structures of the footpath. The majority of the treelines comprise Small Leaved Lime.

### **Buildings and Artificial Surfaces (BL3)**

Concreted and man-made structures are present throughout the works area adjoining the habitats.

### **Floating River Vegetation**

A floating river vegetation (FRV) survey was undertaken on the Lower River Lee catchment in Cork City in order to assess its distribution along the lower reaches of the Lee. There are no areas of high cover in proximity to Morrison's Island. Adjoining the work area FRV is absent or at very low levels of cover (0-4%).

### **Invasive Plant Species**

A targeted invasive plant species survey was carried out in 2014 and in 2018. Invasive species were widespread throughout Cork City. 3 No. terrestrial invasive species were recorded within the River Lee (Japanese knotweed, Himalayan Balsam and Giant Rhubarb). No invasive species were recorded within the confines of Morrison's Island works area.

### **Rare and Protected Flora**

No Annex II listed plant species or Flora Protection Order (FPO) species were recorded during the field surveys.

### **Significance of the Flora**

Floating River Vegetation is absent or consists of small stands with poor quality, diversity and density and classified as of Low Local Importance. Sea walls (CC1) and tidal channels (CW2) are be considered of Low Local Importance within the study area.

#### 4.1.2 FAUNA

##### **Birds**

Bird species seen or heard during the field surveys were mostly typical of garden habitats with notable exceptions described below.

Dipper (*Cinclus hibernicus*) and Grey wagtail is also known to occur on the River Lee, however the species was not recorded in proximity to Morrison's Island. No other species listed on the Birds of Conservation Concern in Ireland (BoCCI) Red List were recorded surveys.

Feeding Grey heron (*Ardea cinerea*) was recorded on the River Lee south channel upstream of the sharp bend in the river at the western end of Sullivan's Quay.

No Annex I bird species were recorded during field surveys.

##### **Mammals**

The study area was searched for signs of mammal activity with dedicated surveys undertaken for Otter (*Lutra lutra*).

##### Otter

The River Lee within the city environs is known to support a population of foraging/commuting Otters. Numerous signs of Otter activity have been recorded in the form of spraints and prints throughout the city. Otters have been noted at O' Sullivan's Quay where old storm culverts in the quay walls are used by otters. It is unknown whether otters have holted in these manmade structures.

On the south channel between the college of commerce at Morrison's Island and the Port of Cork, otters are occasionally seen foraging. Otters spraint the quayside steps on Georges Quay and Union Quay regularly.

##### Bats

Although many of the city quays have crevices and holes of various sizes suitable for use as roosting features, all are subject to inundation at high tide and during flood events so are unlikely to be used by bats due to the risk of drowning.

##### **Fish**

No spawning potential for fish is present in proximity to Morrison's Island. Fish using the area include salmon and lamprey moving up and downstream upstream and minnow, roach, gudgeon, perch, stone loach and European eel. Flounder (*Platichthys flesus*) can be found in the upper tidal reaches of the River Lee. Downstream of Morrison's Island numerous estuarine species are known to occur.

##### **Significance of Fauna**

The River Lee is of significance for a number of faunal species. The presence of the above species indicates potential for the species to occur in the main River Lee and to use the channel for migration. In addition, the river provides habitat for Otter (Annex II, Habitats Directive) although no breeding sites have been identified in proximity to Morrison's Island, Otter do use the area for foraging and commuting.

The River Lee is a very good habitat for otters, given it has healthy fish stocks and good water quality in the main channel. Otter are protected under Annex II of the EU Habitats Directive.

## 5 DESIGNATED SITES IN PROXIMITY TO THE PROPOSED PROJECT

### 5.1 EUROPEAN SITES

Section 3.2.3 of the DEHLG (2010) Guidance for Planning Authorities states that the approach to screening can be different for different plans and projects and will depend on the scale and the likely effects of the project. A key variable that will determine whether or not a particular Natura 2000 site is likely to be negatively affected is its physical distance from the project site.

Furthermore, UK guidance (Scott Wilson et al., 2006) state that a distance of 15km is currently recommended in the case of plans. For projects, the distance could be much less than 15km and in some cases less than 100m, similarly the activity may have an influence on works beyond 15km, but this must be evaluated on a case-by-case basis.

Given the nature of this project and the proposed construction methodology it is considered for the purpose of this screening exercise that the likely zone of influence is the zone immediately around the construction site and those sites that are hydrologically linked downstream.

A review of the National Parks and Wildlife Service database has identified the following European Sites (Natura 2000 sites) as potentially impacted by the proposed project, being in proximity or downstream of the works (See Figure 4.1):

- Great Island Channel SAC (Site Code:004219)
- Cork Harbour SPA (Site Code 004030)

The study area for the Morrison's Island Public Realm and Flood Defence Project encompasses the channel, floodplain and immediate surrounding areas of the River Lee at Morrison's Island. The National Parks and Wildlife Service publish information regarding areas designated for Conservation.

European Sites that are potentially impacted by the proposed works are sites that are in proximity to or are downstream of the works as follows:

- Great Island Channel SAC (Site Code:004219)
- Cork Harbour SPA (Site Code 004030)

#### **Cork Harbour SPA**

Cork Harbour SPA are located approximately 4.7km downstream of the proposed Morrison's Island Public Realm and Flood Defence Project.

Cork Harbour is a large, sheltered bay system, with several river estuaries - principally those of the Rivers Lee, Douglas, Owenboy and Owennacurra. The Cork Harbour SPA site comprises most of the main intertidal areas of Cork Harbour, including all of the North Channel (north of Great Island), the Douglas River Estuary, inner Lough Mahon, Monkstown Creek, Lough Beg, the Owenboy River Estuary, Whitegate Bay and the Rostellan and Poul nabibe inlets (NPWS, 2008). Cork Harbour SPA is an internationally important wetland site regularly supporting over 20,000 wintering waterbirds. In addition to the total number of winter waterbirds it supports, Cork Harbour is internationally important for its populations of black-tailed godwit (*Limosa lapponica*) and redshank (*Tringa totanus*) and of national importance for populations of 18 other species. The shelduck (*Tadorna tadorna*) population is the largest in the country with over 10% of the national total.

The following species are listed as conservation objectives for the SPA:

- Little Grebe (*Tachybaptus ruficollis*) [A004]
- Great Crested Grebe (*Podiceps cristatus*) [A005]
- Cormorant (*Phalacrocorax carbo*) [A017]
- Grey Heron (*Ardea cinerea*) [A028]
- Shelduck (*Tadorna tadorna*) [A048]
- Wigeon (*Anas penelope*) [A050]
- Teal (*Anas crecca*) [A052]
- Pintail (*Anas acuta*) [A054]
- Shoveler (*Anas clypeata*) [A056]
- Red-breasted Merganser (*Mergus serrator*) [A069]
- Oystercatcher (*Haematopus ostralegus*) [A130]
- Golden Plover (*Pluvialis apricaria*) [A140]
- Grey Plover (*Pluvialis squatarola*) [A141]
- Lapwing (*Vanellus vanellus*) [A142]
- Dunlin (*Calidris alpina*) [A149]
- Black-tailed Godwit (*Limosa limosa*) [A156]
- Bar-tailed Godwit (*Limosa lapponica*) [A157]
- Curlew (*Numenius arquata*) [A160]
- Redshank (*Tringa totanus*) [A162]
- Black-headed Gull (*Chroicocephalus ridibundus*) [A179]
- Common Gull (*Larus canus*) [A182]
- Lesser Black-backed Gull (*Larus fuscus*) [A183]
- Common Tern (*Sterna hirundo*) [A193]
- Wetland and Waterbirds [A999]

### **Great Island Channel SAC**

Stretching from Little Island to Midleton, with its southern boundary being framed by Great Island, Great Island Channel SAC is a minimum distance of 9.4 km via the River Lee from the proposed works.

The site 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. The site is designated as an SAC for the following Conservation Interests:

- Tidal Mudflats and Sandflats
- Atlantic Salt Meadows

Tidal Mudflats and sandflats are made up of mixed sediment to sand mud with polychaetes and oligochaetes community complex and are recorded throughout the intertidal and into the shallow subtidal area at this site. The closest area of mudflats and sandflats not covered by sea water at low tide are located over 9.4km from the proposed works.

The overall objective for Atlantic salt meadows in Great Island Channel SAC is to restore the favourable conservation condition. A total (ha) of Atlantic Salt meadows (including mosaics) within the SAC boundary is 18.90ha and is found at Harpers Island, Carrigtohil, Foaty, Bawnard. This habitat within the SAC at the closest point to the project is over 10.5km downstream.

#### **5.2.4 Sites protected under the Cork City Development Plan**

##### **Douglas River Estuary pNHA**

Douglas River Estuary is a proposed Natural Heritage Area is afforded protection under the Cork City Development Plan. The site is approximately 4km downstream of Morrison's Island. Douglas Estuary is large area including the River Estuary and the western intertidal area of Lough Mahon. The site is considered important for its intertidal mudflats, reed and large sedge swamp, brackish / freshwater marsh, coastal lagoons (Beesborough pond), species include the Twin Spotted Wainscot (*Archanara geminipuncta*) found at the head of Douglas Estuary. The site is further noted for waterbirds as identified in Cork Harbour SPA. Morrison's Island is hydrologically linked to the Douglas River Estuary pNHA via the River Lee and Cork Harbour. The habitats and species of interest within the pNHA that is linked to the River Lee main channel are the wetlands which support the bird species also identified within the SPA. The pNHA extends outside the SPA westwards (towards Morrison's Island) along the shoreline by 0.5km. There are no hydrological linkages to the pNHA at Mahon or the Douglas River.

##### **Dunkettle Shore pNHA**

Dunkettle shore pNHA is characterised by woodland, intertidal mudflat and saltmarsh habitats. A notable feature is the Little Egret and Grey Heron Colony in woodland on lands belonging to the Pfizer at Little Island. Rare flora within the pNHA (Bird's Nest Orchid, Wood Fescue, Wood Millet, Wild Onion Wild Celery) are primarily located within/beside woodland habitats along the Glashaboy Estuary. Dunkettle Shore pNHA shares part of its boundary with intertidal mudflats and open shallow bay of Cork Harbour SPA, and known to support nationally important wetlands bird population as identified in the SPA qualifying interest. The pNHA that is hydrologically linked to the River Lee main channel (and Morrison's Island) is entirely within Cork Harbour SPA.

#### **5.2 IDENTIFICATION OF POTENTIAL IMPACTS**

Cork Harbour has a history of problems associated with water pollution and eutrophication (e.g. ERU, 1989). The current water quality status of Cork Harbour is 'moderate' according to the South-Western River Basin Transitional and Coastal Waters Action Programme (SWRBD, 2010b) and therefore fails to meet the required standards as set by the Water Framework Directive. The contributing factors were below standard levels of dissolved inorganic nitrogen (DIN) and dissolved oxygen (DO) with waste water treatment plants (WWTP), combined sewer overflows and treatment plant overflows being the listed pressures.

No direct habitat loss or habitat disturbance is predicted over 4km downstream at Cork Harbour as a result of the proposed works.

### **Cork Harbour SPA**

Cork Harbour is a significant distance downstream of the proposed Project. However, taking a precautionary approach to assessment, the following mechanisms by which an adverse effect on the Conservation Objectives of the SPA might potentially occur during construction activity:

- Disturbance during construction to birds designated within the SPA that are using the River Lee in proximity to Morrison's Island (e.g. Grey Heron);
- Smothering of habitats within the SPA by hydrological linkage as a result of deposition of increased suspended sediments arising from construction phase associated with the proposed works; and
- Deterioration of habitats within the SPA by hydrological linkage as a result of pollution incidences arising from construction or operation of the proposed works.

### **Great Island Channel SAC**

Great Island Channel SAC is over 9km downstream of the project. The following mechanisms by which an adverse effect on the Conservation Objectives of the SAC might potentially occur during construction activity, when considering a precautionary approach, are as follows:

- Smothering of habitats within the SAC by hydrological linkage as a result of deposition of increased suspended sediments arising construction operations associated with the proposed works; and
- Deterioration of habitats within the SAC by hydrological linkage as a result of pollution incidences arising from construction of the proposed works.

**Table 5.1: European Sites, Conservation Objectives and Site Connectivity**

Site Name	Code	Conservation Objectives / Qualifying Interest	Potential connectivity / source pathway receptor link	Potential impact on QI
004030 Cork Harbour SPA		To maintain the favourable conservation condition of the following bird species:	Direct link with SPA via the River Lee	<b>Yes, potential impact as a result of sediment or pollution runoff. Potential disturbance to birds using the River Lee at Morrison's Island</b>
	A004	little grebe ( <i>Tachybaptus ruficollis</i> )	Foraging and roosting sites within the SPA > 4km downstream. Species such as Grey Heron and Cormorant are likely to use the Lee and may occasionally occur within the footprint of the works, (outside of the SPA) however the main site for designated roosting and foraging sites is within the SPA.	
	A005	great crested grebe ( <i>Podiceps cristatus</i> )		
	A017	cormorant ( <i>Phalacrocorax carbo</i> )		
	A028	grey heron ( <i>Ardea cinerea</i> )		
	A048	shelduck ( <i>Tadorna tadorna</i> )		
	A050	wigeon ( <i>Anas penelope</i> )		
	A052	teal ( <i>Anas crecca</i> )		
	A054	pintail ( <i>Anas acuta</i> )		
	A056	shoveler ( <i>Anas clypeata</i> )		
	A069	red-breasted merganser ( <i>Mergus serrator</i> )		
	A130	oystercatcher ( <i>Haematopus ostralegus</i> )		
	A140	golden plover ( <i>Pluvialis apricaria</i> )		
	A141	grey plover ( <i>Pluvialis squatarola</i> )		
	A142	lapwing ( <i>Vanellus vanellus</i> )		
	A149	dunlin ( <i>Calidris alpina</i> )		
	A156	black-tailed godwit ( <i>Limosa limosa</i> )		
	A157	bar-tailed godwit ( <i>Limosa lapponica</i> )		
	A160	curlew ( <i>Numenius arquata</i> )		
	A162	redshank ( <i>Tringa tetanus</i> )		
A164	greenshank ( <i>Tringa nebularia</i> )			
A179	black-headed gull ( <i>Chroicocephalus ridibundus</i> )			
A182	common gull ( <i>Larus canus</i> )			
A183	lesser black-backed gull ( <i>Larus fuscus</i> )			
A193	common tern ( <i>Sterna hirundo</i> )			

Site Name	Code	Conservation Objectives / Qualifying Interest	Potential connectivity / source pathway receptor link	Potential impact on QI
	A999	wetland habitat in Cork Harbour SPA as a resource for the regularly-occurring migratory waterbirds that utilise it	Wetland habitat within the SPA present > 4km downstream	
001058 Great Island Channel SAC	1140	To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater	No habitat present within the works area. Known habitat is present > 9km downstream of the works.	<b>Yes, potential impact as a result of sediment or pollution runoff.</b>
	1130	To restore the favourable conservation condition of Atlantic salt meadows ( <i>Glaucopuccinellietalia maritimae</i> )		

### 5.3 APPROPRIATE ASSESSMENT SCREENING CONCLUSION

There are potential pathways for impacts to the conservation objectives of both European sites (Cork Harbour SPA and Great Island Channel SAC), in the absence of avoidance and mitigation measures, by direct impact and via the release of suspended solids or hydrocarbons that may enter the River Lee and have a negative impact on qualifying habitats and species. Therefore, applying the Precautionary Principle and in accordance with Article 6(3) of the Habitats Directive, the proposed Morrison's Public Realm and Flood Defence Project has the potential to impact on the Qualifying Interests of European sites and should therefore be subject to a **Stage 2 Appropriate Assessment (NIS)**.

### 5.4 Appropriate Assessment Screening Conclusion

There are potential pathways for impacts to the conservation objectives of both European sites (Cork Harbour SPA (004030) and Great Island Channel SAC (001058)), in the absence of any best practice and pollution control, avoidance and mitigation measures via the release of suspended solids or hydrocarbons that may enter the River Lee and have a negative impact on qualifying habitats and species. Therefore, applying the Precautionary Principle and in accordance with Article 6(3) of the Habitats Directive, the proposed Morrison's Island Public Realm and Flood Defence Project has the potential to impact on the Qualifying Interests of European sites and should therefore be subject to a **Stage 2 Appropriate Assessment (NIS)**.

### 5.5 PURPOSE OF THE NATURA IMPACT STATEMENT

The Natura Impact Statement shall identify, in light of the best scientific knowledge in the field, all aspects of the Works that have the potential, either individually or in combination with other plans and projects, to affect the Cork Harbour SPA and Great Island Channel SAC in the context of its Conservation Objectives. In order to facilitate the competent authority (in this case, An Bord Pleanála) in its Appropriate Assessment of the proposed Works, the Natura Impact Statement must contain complete, precise and definitive findings and include an examination, analysis, evaluations, findings, conclusions and a final determination.

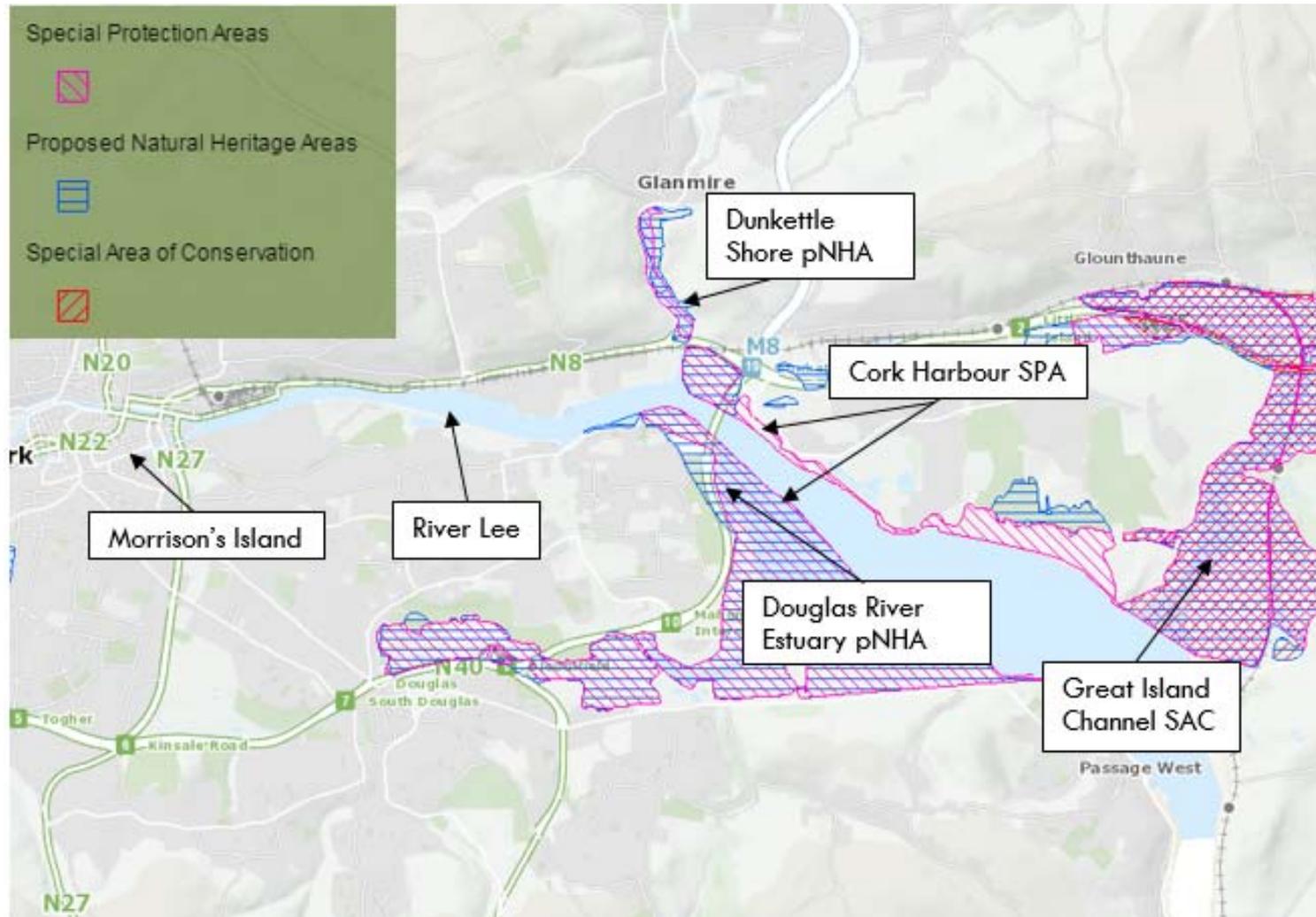


Figure 5.1: Study area and European sites

## 6 IMPACT ASSESSMENT

In this stage the Morrison's Island Public Realm and Flood Defence Project (either alone or in combination with other plans and projects) impact on the integrity of any European Site is considered with respect to their conservation objectives.

### 6.1 TYPES OF IMPACTS ARISING FROM THE WORKS

Potential significant impacts on habitats and species of conservation importance for European sites screened in during Stage 1 are examined, analysed and evaluated in this section. The types of impact identified, e.g. direct and indirect impacts, short- and long-term impacts, construction- and operational-phase impacts etc. arising from the Works are assessed in light of the COs set out for the QIs of those European sites.

#### Cork Harbour SPA

There will be no direct habitat loss within European sites as a result of the Morrison's Island Project as the nearest site, i.e. Cork Harbour SPA is located > 4km downstream of the proposed works. Similarly, there will be no disturbance to the wintering and breeding bird species which are Special Conservation Interests for Cork Harbour SPA. Protected foraging and roosting sites for these species within the SAC are located >4km downstream of the proposed works. Any disturbance of foraging grounds will be temporary and small scale given the overall availability of habitat in the River Lee and downstream in the SPA.

Cork Harbour SPA could potentially be impacted by the proposed Project via surface water pathways e.g. silt laden run off or other pollutants from the site which may enter watercourses or which may enter the storm drain network out falling into adjacent watercourses or via groundwater pathways e.g. percolation of pollutants into groundwater bodies. Cork Harbour SPA is connected to the proposed works areas by the adjacent River Lee.

Invasive species are prolific along the River Lee, however based on surveys carried out in 2018 for invasive species (including Japanese Knotweed, Himalayan Balsam and Gunnera), none have been identified within the study area.

#### Great Island Harbour SAC

Great Island Harbour SAC is located a minimum distance of 9km by surface water from the proposed works. Great Island Channel SAC is also connected to the proposed works by the River Lee. The River Lee at the location of Morrison's Island supports a number of water dependent Annex I habitats and Annex II species, however, it does not support any Qualifying Interests which are listed in the conservation objectives for Great Island Channel SAC. Potential impacts, if any, on the habitats of Qualifying Interest in the Great Island Channel SAC, 9km downstream from a project of this nature and scale, would be as a result of sediment runoff and pollution spills as a result of construction phase works.

#### Potential Impacts

Significant short-term impacts are predicted on a number of QIs for which Cork Harbour SPA and Great Island Channel SAC is designated through the proposed works. These predicted impacts fall into the categories:

- Damage and disturbance or loss of habitat;
- Habitat degradation, e.g. sedimentation.

No Significant long-term impacts are predicted on QIs of Cork Harbour SPA and Great Island Channel SAC during the operational-phase of the Works, in the absence of mitigation.

## **6.2 POTENTIAL IMPACTS ON BIRDS AND WETLAND HABITAT FOR WHICH CORK HARBOUR SPA IS DESIGNATED**

Construction of the proposed scheme creates the potential for habitat degradation downstream of the construction site through accidental input of sediment and/or construction material(s) into the watercourse. Pressure-grouting pose particular threats to the quality of the aquatic environment as the materials used are highly alkaline and, thus, can cause harm to fish and invertebrate prey necessary for maintaining bird populations. In addition, it is not always possible to predict if/where these materials will leak through cracks and fissures in the walls into the watercourse during injection. However, IFI (2016) contains best practice guidelines in relation to this issue and their inclusion in the Methods Statement will prevent any significant impacts of sedimentation/pollution on habitat quality.

The conservation objectives of Cork Harbour SPA include a number of bird species that use Cork City and the River Lee as foraging and roosting sites during high tide, in the area around Morrison's Island numbers of birds is relatively low. Species such as grey heron are found throughout the city. These species are highly habituated to disturbance and urbanisation. The construction phase of the work will result in some birds moving away from the site, however this is temporary in nature and birds will habituate to this disturbance as well as returning to the site outside of construction hours and upon completion of the contract. In addition, given the number of birds using the Morrison's Island area it is considered that there is sufficient foraging and roosting sites available outside of the work zone.

In consideration of the above, the construction and operation of the Project, in the absence of appropriate mitigation measures, will be likely to have significant negative impacts on Bird Species using the wetland area downstream in Cork Harbour SPA.

## **6.3 POTENTIAL IMPACTS ON MUDFLATS AND SANDFLATS NOT COVERED BY SEAWATER AT LOW TIDE AND ATLANTIC SALT MEADOWS FOR WHICH GREAT ISLAND CHANNEL SAC IS DESIGNATED**

Construction of the proposed scheme creates the potential for habitat degradation downstream of the construction site through accidental input of sediment and/or construction material(s) into the watercourse. Pressure-grouting pose particular threats to the quality of the aquatic environment as the materials used are highly alkaline and, thus, can cause harm to invertebrate populations that make up these habitats. In addition, it is not always possible to predict if/where these materials will leak through cracks and fissures in the walls into the watercourse during injection. However, IFI (2016) contains best practice guidelines in relation to this issue and their inclusion in the Methods Statement will prevent any significant impacts of sedimentation/pollution on habitat quality.

Therefore, it is considered that the construction and operation of the Project, in the absence of appropriate mitigation measures, would be likely to have significant negative impacts downstream on the qualifying interests of Great Island Channel SAC.

## **7 CUMULATIVE IMPACTS WITH OTHER PLANS/PROJECTS**

In order to fully assess the potential impact of the proposed development European sites, the project must be assessed alone or in combination with existing activities and proposed plans for the region. The main driver for addressing plans in combination is to ensure that cumulative effects are captured. For example, the effects of a plan on water quality may be insignificant when considered alone, but when in combination

with the effects of increased pollution from other plans or projects, may lead to significant adverse impacts on site integrity.

Determining which plans and projects to consider requires a pragmatic approach given the nature and scale of development; proximity to European Sites; and the potential pathways of risk. Current best practice and available guidance suggests a staged approach, as follows:

- if it can be clearly demonstrated that the plan will not result in any effects at all that are relevant to European site integrity, then the plan should proceed without considering the in-combination test requirement in the Screening further; or,
- if there are identified effects arising from the plan, even if they are perceived as minor and not likely to have a significant effect on the European site alone, then these effects must be considered in combination with the effects arising from other plans and projects.

Individual elements of a project or plan for which there is predicted be no effects at all or inconsequential effects on the European site or because those elements are too general in nature do not require an in-combination assessment since, clearly, they will either have no cumulative effects or cumulative effects cannot be identified.

In the case of the proposed Works at Morrison's Island, the Works provide for potentially significant adverse effects on species listed as QIs of the Cork Harbour SPA and Great Island Channel SAC. Therefore, an assessment of the potential cumulative impacts of the Project with other plans or projects in the likely zone of impact must be undertaken.

Cork City Council Planning Register, the (EPA) EIA Portal, Cork County Development Plan 2014 – 2020 and Cork City Development Plan 2015 - 2021 were consulted in order to determine if there were any other plans or projects in the area which could result in cumulative impacts.

The River Bride (Blackpool) Certified Drainage Scheme previously formed part of the larger Lower Lee (Cork City) Drainage Scheme, which is now divided into two Schemes. The River Bride (Blackpool) Certified Drainage Scheme is currently under review by the Department of Public Expenditure and Reform. The Lower Lee (Cork City) Drainage Scheme is currently at design stage with a proposed submission in 2019. Both schemes are outside of any European site, and include measures for the avoidance and prevention of deterioration to water quality during construction. With mitigation in place the River Bride (Blackpool) Certified Drainage Scheme will have no significant impact on water quality or on downstream habitats and species associated with European Sites.

The Lower Lee (Cork City) Drainage Scheme and the River Bride (Blackpool) Certified Drainage Scheme are identified within the Cork City Development Plan in order to address the flooding in the lower reaches of the River Lee and the River Bride in Blackpool and Ballyvolane. The Plan has been subject to Flood Risk Assessment and Appropriate Assessment Screening.

An AA Screening report was prepared for the Cork City Development Plan which identified the following potential impacts on the Cork Harbour SPA and the Great Island Channel SAC as a result of the implementation of the development plan:

- Direct loss of habitat from construction of new residential and other developments to cater for an increasing population within Cork's administrative area;
- Reduction in water quality due to new WWTP;

- Damage / Degradation of Habitats and Disturbance to Species due to construction and development activities in close proximity to Cork Harbour SPA;
- Reduction in water flows;
- Spread of invasive alien species disturbed during construction activities.

No developments within the Cork City Development Plan are proposed for within the boundaries of Cork Harbour SPA, therefore no direct loss of habitat through land take or fragmentation is anticipated. There are no plans for the construction of any major infrastructure. According to the AA Screening report *“it is the aim of the Council to ensure that the EU Water Framework Directive is implemented. This objective is to ensure that development would not have an unacceptable impact on water quality and quantity, which includes surface water, ground water, designated source protection areas, river corridors and associated wetlands, estuarine waters, coastal and transitional waters. Such water quality objectives will ensure that the River Lee, its tributaries, Cork Harbour SPA and Great Island Channel SAC are protected, and therefore, will not result in any indirect impacts on the Natura 2000 sites”*. Measures to control and prevent the introduction and establishment of ecologically damaging alien invasive species, such as good site hygiene practices for the movement of materials into, out of and around the site and ensuring that imported soil is free of seeds and rhizomes of invasive plant species, will also be implemented as part of the development plan. The AA Screening concluded that there would be no negative impacts on Cork Harbour SPA or Great Island Channel SAC as a result of the development plan. Cork City Development Plan identified and support proposal for the redevelopment of the Port of cork.

Cork Harbour SPA and Great Island Channel SAC were brought forward for NIS due to the potential for impacts identified relating to Port Activities. A series of objectives and policies have been put in place in order to protect the site from activities and development. Objective TM 5 -2 ensures no adverse effect on European sites by the following *“The Council is committed to engage with the Port of Cork and other relevant stakeholders in achieving this objective in a manner that is compatible with environmental, landscape and nature conservation designations that pertain to the harbour area.”*

There is no in combination impact as a result of the proposed Project.

Other plans and projects within the region include:

- Regional Planning Guidelines for the South-West Region 2010-2022;
- River Basin Management Plan for Ireland 2018 – 2021;
- Cork Area Strategic Plan Update 2008;
- Mahon Local Area Plan 2014-2020;
- South Docks Local Area Plan 2008-2018;
- Farranferris Local Area Plan 2009-2015;
- North-West Regeneration Masterplan 2011;
- Water Services Investment Programme;
- IPPC Programme;
- Local Authority Discharge;
- Groundwater Pollution Reduction Programmes;
- Surface Water Pollution Reduction Programmes;
- Lee Catchment Flood Risk Assessment and Management Study.

The plans identified above include policies and objectives aimed at protecting the natural environment, including Natura 2000 sites and all projects likely to have a significant effect on Natura 2000 sites will be

subject to Appropriate Assessment Screening and projects will only be approved if they comply with the Habitats Directive. No other pathway has been identified by which any of the plans and programmes identified could have a significant 'in combination' effect on any of the Natura 2000 sites identified.

Furthermore, project/site specific best practice measures will be implemented for the site investigation and construction works of the Morrison's Island Public Realm and Flood Defence Project in order to avoid pollution and/or sedimentation of watercourses as a result of run-off from construction activities. Measures will also be put in place to ensure non-native invasive species within the works area are not disturbed and spread as a result of the proposed works. Where required, an invasive species management plan will be prepared with proposals for advanced works contracts (where necessary) in order to eradicate existing invasive species infestations. Therefore, no "in-combination" effect on any Natura 2000 site is anticipated as a result of the proposed project.

## 8 MITIGATION MEASURES

The potential for significant impacts predicted in Section 6.0 require appropriate mitigation measures so that the project will not lead to significant effects on Cork Harbour SPA and Great Island Channel SAC in light of their conservation objectives.

Section 8.1 recommends mitigation measures for each of the QIs considered likely to be affected by the Works. The measures outlined in the following sections are recommended in light of significant effects likely to arise from the Works where impacts are predicted.

### 8.1 MITIGATION FOR BIRD SPECIES AND WETLANDS OF CORK HARBOUR SPA AND THE PROTECTED HABITATS OF GREAT ISLAND CHANNEL SAC

The impact of temporary habitat loss for birds and their associated wetlands during the construction phase has the potential to give rise to significant effects. Similar there is risk of temporary impact on saltmarsh and mudflats habitats as a result of construction runoff and pollution. However, provided that works include best practice pollution control measures there will be no significant effect. The potential for habitat degradation through input of sediment and/or construction material(s) into the harbour during the works shall be managed by strict adherence to standard best practice guidance, i.e. IFI (2016) and NRA (2008). Particular attention shall be paid to Section 10.4 of IFI (2016), which states the following: "During grout injection, at least one member of a repair crew should be closely monitoring for grout losses both upstream and downstream of the structure. Portable pH monitoring facilities should always be available and staff trained in its use." There are not predicted to be any significant long-term effects as a result of the works. Therefore, no specific measures to mitigate for long-term effects on these species are proposed.

Mitigation for Sedimentation: In light of the potential abiotic changes to the River Lee and the downstream harbour area as a result of sedimentation during the construction stage, it is considered prudent to require the Contractor to prepare and implement a Construction Pollution Control Plan (CPCP) as part of their Construction and Environmental Management Plan. This plan shall include the following elements:

1. Limiting of site works to the minimum area and timescale required to undertake the necessary elements of the Works;
2. Formulation of a Dust Minimisation Plan for the Works;
3. Direction of site drainage through a settlement facility prior to discharge and provision of temporary facilities to trap any accidental spillage;

4. Siltation traps (e.g. Sedimats™) will be installed in any drains in the vicinity of excavations.
5. Where there is risk of falling debris and silts entering the watercourse netting will be employed to prevent them from entering the watercourse.
6. Ingress of river water into excavations by lateral intrusion or precipitation will require the deployment of pumps. The pumps shall be integrated pump or shall sit on an appropriately sized drip tray which is monitored and emptied regularly. Where required submersible pumps shall be deployed. The maintenance and refuelling of pumps shall be undertaken in accordance with standard best practice.
7. A Method Statement for the Works to be submitted to IFI to ensure that the proposed methods satisfy fisheries requirements;
8. Promotion of awareness of the importance of site management and the freshwater environment amongst site personnel; Toolbox talks to be given by a qualified ecologist to all contractor personnel.
9. Restriction of topsoil stripping to dry weather conditions;
10. Pouring of concrete, sealing of joints, application of water-proofing paint or protective systems, curing agents etc. to be completed in the dry;
11. Storage of oils, fuel, chemicals, hydraulic fluids etc. to be located at least 10m from the stream on an impervious base within a bund and appropriately secured;
12. A Project Ecologist will be appointed for the duration of the works;
13. Measures shall be deployed for silt removal from pumped water. The discharge of suspended solids should not exceed 25mg/l. A baseline threshold for suspended solids and turbidity levels shall be identified by the site ecologist (and approved by the employer's representative);
14. Spill kits and hydrocarbon absorbent packs will be available and drip trays will be used during refuelling. All relevant personnel will be fully trained in the use of this equipment;
15. All machinery operating near the River Lee to be steam-cleaned in advance of Works and routinely checked to ensure no leakage of oils or lubricants and all fuelling of machinery to be undertaken a minimum of 10m from watercourses.

It is considered that the implementation of such a CPCP will mitigate against any residual adverse effects arising from the Works on the integrity of Cork Harbour SPA and Great Island Channel SAC in terms of its structure and function.

Table 8.1: Assessment of potential impacts on European sites

European Sites (SAC, SPA)	Qualifying Interest (Conservation Objective)	Presence within the SPA/Zone of influence	Potential Impact	NIS Conclusion
Cork Harbour SPA	Little grebe ( <i>Tachybaptus ruficollis</i> )	Foraging and roosting sites within the SPA > 4km downstream. Species such as Grey Heron are likely to use the Lee in proximity of the works, (outside of the SPA) however the main site for designated roosting and foraging sites is within the SPA.	SPA site is located > 4 km downstream of the proposed works. Best practice pollution control measures and mitigation as identified in Section 8 above will result in reductions in pollution and sediment release. While many birds protected within the SPA will be found using the River Lee upstream of the SPA and where works are proposed they are habituated to disturbance and will not be significantly impacted by disturbance during the construction phase.	No Impact
	Great crested grebe ( <i>Podiceps cristatus</i> )			No Impact
	Cormorant ( <i>Phalacrocorax carbo</i> )			No Impact
	Grey heron ( <i>Ardea cinerea</i> )			No Impact
	Shelduck ( <i>Tadorna tadorna</i> )			No Impact
	Wigeon ( <i>Anas penelope</i> )			No Impact
	Teal ( <i>Anas crecca</i> )			No Impact
	Pintail ( <i>Anas acuta</i> )			No Impact
	Shoveler ( <i>Anas clypeata</i> )			No Impact
	Red-breasted merganser ( <i>Mergus serrator</i> )			No Impact
	Oystercatcher ( <i>Haematopus ostralegus</i> )			No Impact
	Golden plover ( <i>Pluvialis apricaria</i> )			No Impact
	Grey plover ( <i>Pluvialis squatarola</i> )			No Impact
	Lapwing ( <i>Vanellus vanellus</i> )			No Impact
	Dunlin ( <i>Calidris alpina</i> )			No Impact
	Black-tailed godwit ( <i>Limosa limosa</i> )			No Impact
	Bar-tailed godwit ( <i>Limosa lapponica</i> )			No Impact
	Curlew ( <i>Numenius arquata</i> )			No Impact
	Redshank ( <i>Tringa tetanus</i> )			No Impact
	Greenshank ( <i>Tringa nebularia</i> )			No Impact
Black-headed gull ( <i>Chroicocephalus ridibundus</i> )	No Impact			
Common gull ( <i>Larus canus</i> )	No Impact			
Lesser black-backed gull ( <i>Larus fuscus</i> )	No Impact			
Common tern ( <i>Sterna hirundo</i> )	No Impact			

European Sites (SAC, SPA)	Qualifying Interest (Conservation Objective)	Presence within the SPA/Zone of influence	Potential Impact	NIS Conclusion
	Wetlands	Wetland habitat within the SPA present > 4km downstream	No potential impact downstream. No wetland habitat present within the works area. Best practice pollution control measures and mitigation as identified in Section 8 above will result in reductions in pollution and sediment release.	No Impact
Great Island Channel SAC	Mudflats and sandflats not covered by seawater at low tide	Not present within the zone of influence of the proposed works.	SAC site is located > 9 km downstream of the proposed works. Best practice pollution control and mitigation measures as identified in Section 8 above will result in reductions in pollution and sediment release.	No Impact
	Atlantic salt meadows (Glaucopuccinellietalia maritimae)			No Impact

## 9 CONCLUSIONS

Potential impacts during the proposed Morrison Island Public Realm and Flood Defence Project Construction and Operational Stage have been considered in the context of 2 European sites: Cork Harbour SPA and Great Island Channel SAC and their Conservation Objectives.

It has been concluded that, taking a precautionary approach, in the absence of pollution control and appropriate mitigation measures, significant adverse effects on the Qualifying Interests of Cork Harbour SPA and Great Island Channel SAC and their respective Conservation Objectives could arise from the Project. The likely significant effects of the proposed Works are limited to input of pollution spills, sediment and/or construction material(s) on the Qualifying Interests of the sites. The Natura Impact Statement has proposed appropriate mitigation measures intended to eliminate these effects or, where this is not possible, to minimise these effects such that they can no longer be judged to be significant. These measures include:

- Implementation of a Construction Pollution and Sediment Control Plan. Any residual effects remaining after the implementation of the mitigation measures proposed have been assessed as being insignificant in light of the site's Conservation Objectives.

Having had due regard to all current guidance on the assessment of plans and projects that would be likely to have significant effects on European sites and having prepared this Natura Impact Statement, it has been concluded that in view of best scientific knowledge and on the basis of objective information, that the proposed Project, either on its own or in combination with other plans and projects and given strict adherence to best practice guidelines and implementation of the mitigation measures proposed, would not give rise to any direct or indirect significant effects on any European Site designated for nature conservation.