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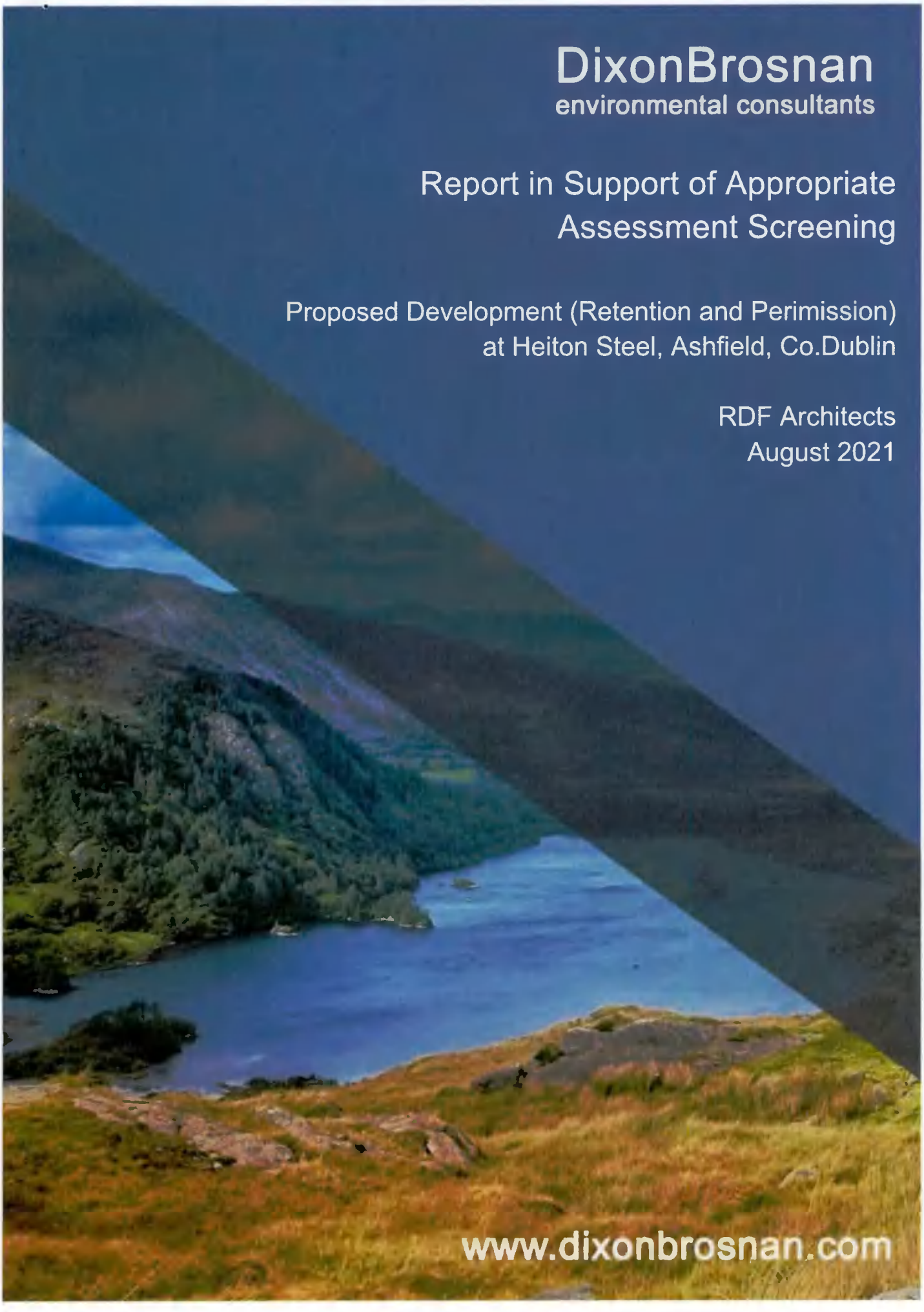
Report in Support of Appropriate Assessment Screening

Proposed Development (Retention and Perimission)
at Heiton Steel, Ashfield, Co.Dublin

RDF Architects
August 2021



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Project	Report in Support of Appropriate Assessment Screening Proposed Development (Retention and Perimission) at Heiton Steel, Ashfield, Co.Dublin	
Client	RDF Architects	
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Date	**Revision**	**Prepared By**
06/06/21	1st Draft	Carl Dixon BSc MSc
04/08/21	Final report	Sorcha Sheehy BSc PhD

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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 at Heiton Steel, Ashfield, Co. Dublin, 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 South Dublin 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 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, are 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.

This report has been prepared with regard to the following guidance documents, where relevant.

- *Managing Natura 2000 Sites: The Provision of Article 6 of the Habitats Directive 92/43/EEC* (European Commission (EC), 2018);
- *Assessment of Plans and Projects Significantly Affecting Natura 2000 sites: Methodical Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC* (European Commission (EC), 2001);
- *Guidance Document on Article 6(4) of the Habitats Directive 92/43/EEC* (European Commission, (EC) 2007);
- *Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities* (Department of Environment, Heritage and Local Government, 2010 revision);
- *Appropriate Assessment under Article 6 of the Habitats Directive; Guidance for Planning Authorities. Circular NPW 1/10 and PSSP 2/10* (Department of Environment, Heritage and Local Government, 2010);
- *Guidelines for Good Practice Appropriate Assessment of Plans under Article 6(3) Habitats Directive* (International Workshop on Assessment of Plans under the Habitats Directive, 2011);
- *Communication from the Commission on the precautionary principle. European Commission* (2000) and
- 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, Great Island Gas Pipeline etc. He has carried out ecological surveys and prepared AA/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 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, Waste to Energy Facility Ringaskiddy and Water Storage Schemes for Irish Water.

2. Regulatory Context and 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).

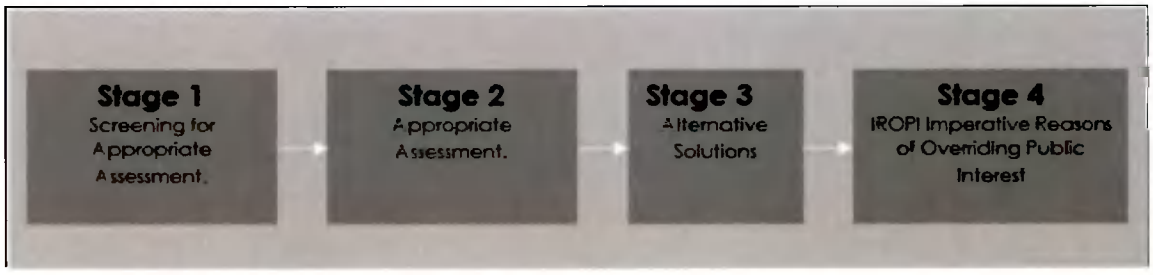
Under the Directive a network of sites of nature conservation importance have been identified by each Member State as containing specified habitats or species requiring to be maintained or returned to favourable conservation status. In Ireland the network consists of SACs and SPAs, and also candidate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

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. It is confirmed that no reliance is placed by the developer on Stage Three in the context of this application for development consent;

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). Again, for the avoidance of doubt, it is confirmed that no reliance is placed by the developer on Stage Four in the context of this application for development consent.

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

3. Receiving Environment

3.1 Existing Site

The proposed development is located within the Heiton Steel facility at the Ballymount Industrial Estate, Ashfield, Dublin (**Figure 1**). The site is located to the south of the Naas Road (National Route N7) and approximately 600m southwest of the M50 motorway. The site is bounded to the north and east by existing industrial units and to the south by the Newlands Cross Crematorium. Lands to the east are dominated by marginal grassland and scrub habitat.

Figure 1. Site location| Source OSI.ie

Figure 2. Proposed development site overview | Source DRA Consulting Engineers

3.2 Proposed Development

The proposed development includes the following

Retention for:

A) 2 bay portal frame,

B) Additional floor area to existing industrial unit,

and Permission for:

C) Roofing of 2 bay Portal Frame Structure,

D) Extension to existing industrial unit,

E) Construction of a Concrete Resurfaced Area in main yard,

F) Minor internal layout & elevation revisions to existing industrial unit,

and all associated site works including underground surface water attenuation and related utilities & works at Heiton Steel, Ashfield, Naas Rd, Clondalkin, Dublin.

An overview of the proposed development is shown in **Figure 2**. Site drawings are included in **Appendix 2.**

As part of the proposed works, it is proposed to demolish the existing toilet facilities and reconstruct it in the new extension. The new toilet facilities will match the size of the existing arrangement. For this reason, the proposed development will not increase the foul load on the existing foul sewer. Detail of foul water calculations are included in **Appendix 4.**

A new 100mm foul line service connection will be required in order to connect toilet from the new location into existing manhole.

It is proposed to discharge the surface water from the proposed development to the existing surface water network on site.

Prior to discharge from the subject site, it is proposed to attenuate the surface water from the development so as to minimise the downstream impact.

The following specifications and requirements have been followed in respect to surface water design:

Minimum depth	1.2m cover under roadways 0.9m elsewhere
Minimum sewer size	225mm
Runoff factors for pipe sizing	100% paved and roof surfaces
Rainfall for initial pipe sizing	50mm/hr rainfall intensity

Minimum velocity (pipe full)	0.75 m/sec
Flooding	Check made for adequate protection. No surcharging in respect of flow for return period less than 30 years No flooding in respect of flow for return period less than 100 years +20%CC.
Roughness	Ks 0.6mm
Permissible Site Discharge	5 l/s

The surface water from the development will be routed to an underground attenuation tank before discharged into the existing 225mm diameter stormwater line via a flow control manhole.

Surface water attenuation has been designed in accordance with the requirements of the Greater Dublin Strategic Drainage Study (GDSDS). Included in **Appendix 3** of this report is hydraulic modelling calculations (carried out using Causeway Flow) to demonstrate the following:

- Drainage pipework designed for the 1 in 5 year return period;
- No flooding occurring for the 1 in 30 year return period; and
- Properties protected against flooding for the 1 in 100 year return period + 20% CC.

4. Screening

4.1 Introduction

This section contains the information required for the competent authority to undertake screening for AA for the proposed development.

The aims of this section are to:

- Determine whether the proposed development is directly connected with, or necessary to, the conservation management of any Natura 2000 Sites;
- Provide information on, and assess the potential for the proposed development to significantly effect on Natura 2000 Sites (also known as European sites); and
- 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.

The proposed development is not directly connected with, or necessary to the conservation management of any Natura 2000 sites.

4.2 Study Area and Scope of Appraisal

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).

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 in-combination impacts which could arise from the proposed development in relation to the designated sites within this zone were considered.

4.3 Field Study

A site inspection was carried out on the 3rd of June 2021 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.

4.4 Source-Pathway-Receptor Model

The likely effects of the proposed development on any European site has been assessed using a source-pathway-receptor model, where:

- A 'source' is defined as the individual element of the proposed works that has the potential to impact on a European site, its qualifying features and its conservation objectives.
- A 'pathway' is defined as the means or route by which a source can affect the ecological receptor.
- A 'receptor' is defined as the SCI of SPAs or QI of SACs for which conservation objectives have been set for the European sites being screened.

A source-pathway-receptor model is a standard tool used in environmental assessment. In order for an effect to be likely, all three elements of this mechanism must be in place. The absence or removal of one of the elements of the mechanism results in no likelihood for the effect to occur. The source-pathway-receptor model was used to identify a list of European sites, and their QIs/SCIs, with potential links to European sites. These are termed as 'relevant' European sites/QIs/SCIs throughout this report.

4.5 Likely Significant Effect

The threshold for a Likely Significant Effect (LSE) is treated in the screening exercise as being above a de minimis level. The opinion of the Advocate General in CJEU case C-258/11 outlines:

"the requirement that the effect in question be 'significant' exists in order to lay down a de minimis threshold. Plans or projects that have no appreciable effect on a European site are thereby excluded.

If all plans or projects capable of having any effect whatsoever on the site were to be caught by Article 6(3), activities on or near the site would risk being impossible by reason of legislative overkill."

In this report, therefore, 'relevant' European sites are those within the potential ZoI of activities associated with the construction and operation of the proposed development, where LSE pathways to European sites were identified through the source-pathway-receptor model.

4.6 Screening Process

The Screening for Appropriate Assessment incorporates the following steps:

- Definition of the zone of influence for the proposed works;
- Identification of the European sites that are situated (in their entirety or partially or downstream) within the zone of influence of the proposed works;
- Identification of the most up-to-date QIs and SCIs for each European site within the zone of influence;
- Identification of the environmental conditions that maintain the QIs/SCIs at the desired target of Favourable Conservation Status;
- Identification of the threats/impacts – actual or potential that could negatively impact the environmental conditions of the QIs/SCIs within the European sites;
- Highlighting the activities of the proposed works that could give rise to significant negative impacts; and
- Identification of other plans or projects, for which in-combination impacts would likely have significant effects.

4.7 Desktop Review

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 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
- Invasive Species Ireland - http://www.invasivespeciesireland.com/

- *Best Practice Guidance for Habitat Survey and Mapping* (Heritage Council, 2011)
- South Dublin County Council Development Plan 2016-2022 (South Dublin County Council, 2016)
- Information on the status of EU protected habitats in Ireland (National Parks & Wildlife Service, 2013a & 2013b)
- South Dublin County Council Planning Database
- Ringsend WWTP (Reg D0034-01) Annual Environmental Report (AER) 2019 (Irish Water 2020)

5. Natura 2000 Sites

5.1 Designated sites within a 15km Radius

Natura 2000 sites within a 15 km radius of the proposed development site are listed below in **Table 1** and shown in **Figure 3**. It is noted that use of a 15km radius is a precautionary measure, as impacts at this distance from the proposed development are highly unlikely in the absence of recognisable pathways.

The proposed development is not located within any Natura 2000 site. Surface water from the proposed development site discharges into an existing surfaces water drainage network. This network drains into the Coolfan Stream approximately 80m south of the site. This stream ultimately drains into the Liffey Estuary approximately 14.6km downstream of the site via the Robinhood Stream, the Camac Stream and the River Liffey. The Liffey Estuary Lower is located adjacent to the South Dublin Bay SAC, North Dublin Bay SAC, North Bull Island SPA and the South Dublin Bay & River Tolka Estuary SPA. Therefore, although unlikely given the dilution available, surface waters generated during construction could potentially carry silt, hydrocarbons or other contaminants into these Natura 2000 sites.

Wastewater discharging from the proposed development will be conveyed to the Ringsend WWTP for treatment prior to discharging into the Dublin Bay/ Liffey Estuary Lower. Four of the Natura 2000 sites listed in **Table 1** are located within Dublin Bay (South Dublin Bay SAC, North Dublin Bay SAC, North Bull Island SPA and the South Dublin Bay & River Tolka Estuary SPA). Qualifying species and habitats within these Natura 2000 sites could potentially be impacted via a reduction in water quality.

Therefore, a source-pathway-receptor link has been identified between the source (the proposed development) and the receptor (South Dublin Bay SAC, North Dublin Bay SAC, North Bull Island SPA and the South Dublin Bay & River Tolka Estuary SPA) via a potential pathway (discharge of surface water run-off during construction/operation, wastewater discharges during operation and the spread of invasive species).

The South Dublin Bay SAC and North Dublin Bay 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. North Bull Island SPA and the South Dublin Bay & River Tolka Estuary SPA are recognised under the E.U. Birds Directive as being of international importance by regularly supporting in excess of 20,000 wintering waterfowl including Annex I listed species under the

E.U. Birds Directive. Further information on these sites is provided below. Site synopses for these Natura 2000 are included in **Appendix 1.**

It is noted that the proposed development site does not include any habitats which could potentially provide foraging or roosting habitat for SCI species within the North Bull Island SPA and the South Dublin Bay, River Tolka Estuary SPA or the Wicklow Mountains SPA (Refer to **Section 7**). Given the limited scale of the proposed development, the lack of a hydrological connection, the lack of foraging/roosting habitat for SCI birds and the distances involved, no potential impact on other designated sites has been identified.

Table 1. Natura 2000 sites and their location relative to the proposed development site

Natura 2000 Sites **Special Area of Conservation (SAC)**	*Site Code*	*Distance at closest point and potential source-pathway-receptor link*	
Glenasmole Valley SAC	001209	6.0km south. No pathway exists	**Habitats** 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) 6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) 7220 Petrifying springs with tufa formation (Cratoneurion)*
Wicklow Mountains SAC	001209	8.4km south. No pathway exists	**Habitats** 3110 Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) 3160 Natural dystrophic lakes and ponds 4010 Northern Atlantic wet heaths *with Erica tetralix* 4030 European dry heaths 4060 Alpine and Boreal heaths

Natura 2000 Sites	*Site Code*	*Distance at closest point and potential source-pathway-receptor link*	
			6130 Calaminarian grasslands of the Violetalia calaminariae 6230 Species-rich Nardus grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe)* 7130 Blanket bogs (* if active bog) 8110 Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani)* 8210 Calcareous rocky slopes with chasmophytic vegetation 8220 Siliceous rocky slopes with chasmophytic vegetation 91A0 Old sessile oak woods with Ilex and Blechnum in the British Isles **Species** 1355 Otter (*Lutra lutra*)
Rye Water Valley/Carton SAC	001398	9.3km northwest. No pathway exists.	**Habitats** 7220 Petrifying springs with tufa formation (Cratoneurion)* Species 1016 Desmoulin's Whorl Snail (*Vertigo moulinsiana*) 1014 Narrow-mouthed Whorl Snail (*Vertigo angustior*)
South Dublin Bay SAC	000210	11.1km northeast. Although improbable, a potential impact on this SAC has been identified from discharges of surface water or wastewater which will ultimately discharge into Dublin Bay/ Liffey Estuary Lower.	**Habitats** 1140 Mudflats and sandflats not covered by seawater at low tide 1210 Annual vegetation of drift lines 1310 Salicornia and other annuals colonising mud and sand 2110 Embryonic shifting dunes

Natura 2000 Sites	*Site Code*	*Distance at closest point and potential source-pathway-receptor link*	
North Dublin Bay SAC	000206	13.9km northeast. Although improbable, a potential impact on this SAC has been identified from discharges of surface water or wastewater which will ultimately discharge into Dublin Bay/ Liffey Estuary Lower.	**Habitats** 1140 Mudflats and sandflats not covered by seawater at low tide 1210 Annual vegetation of drift lines 1310 Salicornia and other annuals colonising mud and sand 1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) 1410 Mediterranean salt meadows (Juncetalia maritimi) 2110 Embryonic shifting dunes 2120 Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) 2130 Fixed coastal dunes with herbaceous vegetation (grey dunes)* 2190 Humid dune slacks **Species** 1395 Petalwort (*Petalophyllum ralfsii*)
Special Protection Area (SPA)			
Wicklow Mountains SPA	004040	9.7km south. No pathway exists.	**Birds** A098 Merlin (*Falco columbarius*) A103 Peregrine (*Falco peregrinus*)
South Dublin Bay and River Tolka Estuary SPA	004024	11.0km. Although improbable, a potential impact on this SPA has been identified from discharges of surface water or wastewater which will ultimately discharge into Dublin Bay/ Liffey Estuary Lower	**Birds** A144 Sanderling (*Calidris alba)* A157 Bar-tailed Godwit (*Limosa lapponica*) A149 Dunlin (*Calidris alpina*) A162 Redshank (*Tringa totanus*) A179 Black-headed Gull (*Chroicocephalus ridibundus*) A143 Knot (*Calidris canutus*) A192 Roseate Tern (*Sterna dougallii*)

Natura 2000 Sites	*Site Code*	*Distance at closest point and potential source-pathway-receptor link*	
			A046 Light-bellied Brent Goose (*Branta bernicla hrota*) A141 Grey Plover (*Pluvialis squatarola*) A130 Oystercatcher (*Haematopus ostralegus*) A194 Arctic Tern (*Sterna paradisaea*) A193 Common Tern (*Sterna hirundo*) A137 Ringed Plover (*Charadrius hiaticula*) **Habitats** Wetlands
North Bull Island SPA	004006	13.9km northeast. Although improbable, a potential impact on this SPA has been identified from discharges of surface water or wastewater which will ultimately discharge into Dublin Bay/ Liffey Estuary Lower	Birds A160 Curlew (*Numenius arquata*) A149 Dunlin (*Calidris alpina*) A157 Bar-tailed Godwit (*Limosa lapponica*) A162 Redshank (*Tringa totanus)* A179 Black-headed Gull (*Chroicocephalus ridibundus*) A144 Sanderling (*Calidris alba*) A156 Black-tailed Godwit (*Limosa limosa*) A143 Knot (*Calidris canutus*) A169 Turnstone (*Arenaria interpres*) A054 Pintail (*Anas acuta*) A046 Light-bellied Brent Goose (*Branta bernicla hrota*) A048 Shelduck (*Tadorna tadorna*) A052 Teal (*Anas crecca*) A141 Grey Plover (*Pluvialis squatarola*) A056 Shoveler (*Anas clypeata*) A130 Oystercatcher (*Haematopus ostralegus*) A140 Golden Plover (*Pluvialis apricaria*)

Natura 2000 Sites	Site Code	Distance at closest point and potential source-pathway-receptor link	
			Habitats Wetlands

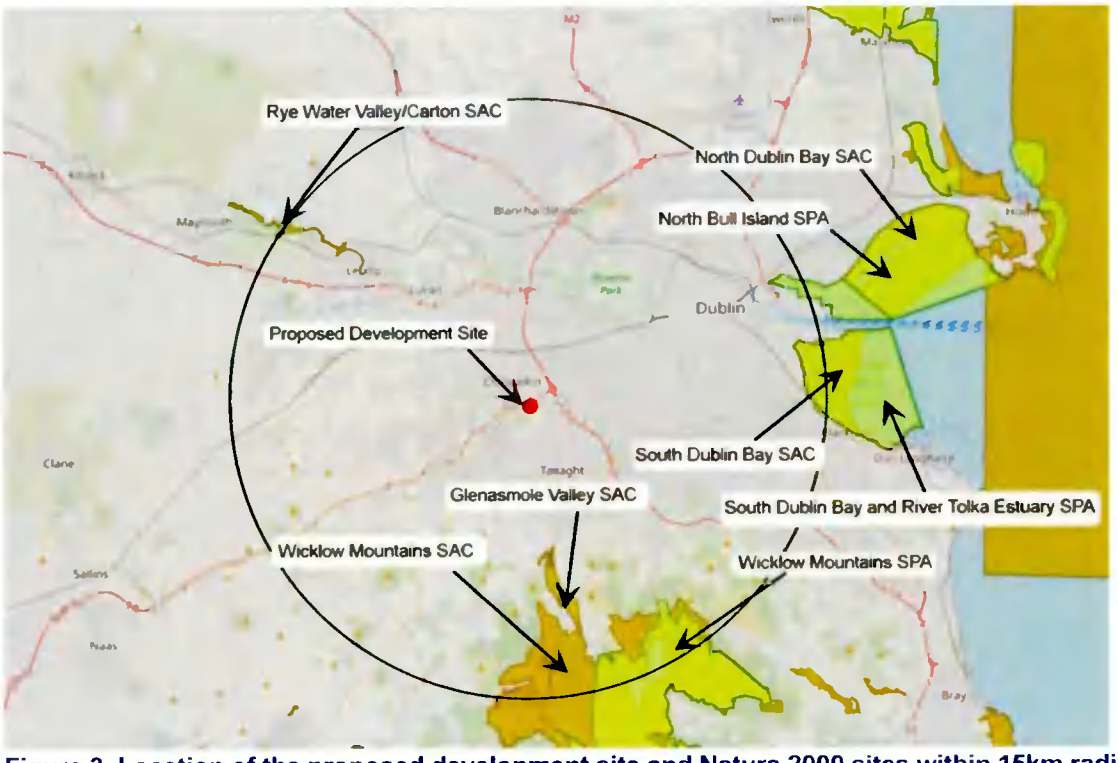


Figure 3. Location of the proposed development site and Natura 2000 sites within 15km radius | Source: EPA Envision mapping https://gis.epa.ie/EPAMaps/) | Not to scale

5.2 European Sites Descriptions

5.2.1 North Dublin Bay SAC

The North Bull Island sand spit is a relatively recent depositional feature, formed as a result of improvements to Dublin Port during the 18th and 19th centuries. It is almost five kilometres long and one kilometre wide and runs parallel to the coast between Clontarf and Sutton. The sediment which forms the island is predominantly glacial in origin and siliceous in nature. Between the island and the mainland there occurs two sheltered intertidal areas which are separated by a solid causeway constructed in 1964. The seaward side of the island has a fine sandy beach. A substantial area of shallow marine water is included in the site. The interior of the island is excluded from the site as it has been converted to golf courses. The proximity of the North Bull Island to Dublin City results in it being a very popular recreational area. It is also very important for educational and research purposes. Nature conservation is a main land use within the site.

Site possesses an excellent diversity of coastal habitats. The North Bull Island dune system is one of the most important systems on the east coast and is one of the few in Ireland that is actively accreting. It possesses extensive and mostly good quality examples of embryonic, shifting marram and fixed dunes, as well as excellent examples of humid dune slacks. Both Atlantic and Mediterranean salt marshes are well represented and a particularly good marsh zonation is shown. The salt marshes grade into mudflats and sandflats, some of which are dominated by annual Salicornia species. *Petalophyllum ralfsii* occurs at its only known station away from the western seaboard. The site has five Red Data Book vascular plant species and four Red Data Book bryophyte species. This is one of the most important sites for wintering waterfowl in Ireland, with internationally important populations of *Branta bernicla horta*, *Calidris canutus* and *Limosa lapponica*, plus nationally important numbers of a further 14 species. 20% of the national total of *Pluvialis squatarola* occurs here. Formerly it had important colony of *Sterna albifrons*. North Dublin Bay is nationally important for three insect species. The scientific interests of the site have been well documented and future prospects are good owing to the various designations assigned to site.

5.2.2 South Dublin Bay SAC

This intertidal site extends from the South Wall at Dublin Port to the West Pier at Dun Laoghaire, a distance of approximately 5 km. At their widest, the intertidal flats extend for almost 3 km. The seaward boundary is marked by the low tide mark, while the landward boundary is now almost entirely artificially embanked. Several permanent channels exist, the largest being Cockle Lake. A small sandy beach occurs at Merrion Gates, while some bedrock shore occurs near Dun Laoghaire. A number of small streams and drains flow into the site. The proximity of the site to Dublin City results in it being a very popular recreational area. It is also important for educational and research purposes.

Site possesses a fine and fairly extensive example of intertidal flats. Sediment type is predominantly sand, with muddy sands in the more sheltered areas. A typical macro-invertebrate fauna exists. Has the largest stand of Zostera on the east coast. Supports part of the important wintering waterfowl populations of Dublin Bay. Regularly has an internationally population of *Branta bernicila horta*, plus nationally important numbers of at least a further 6 species, including *Limosa lapponica*. Regular autumn roosting ground for significant numbers of *Sterna* terns, including *S. dougallii*. The scientific interests of the site have been well documented.

5.2.3 North Bull Island SPA

The North Bull Island sand spit is a relatively recent depositional feature, formed as a result of improvements to Dublin Port during the 18th and 19th centuries. It is almost 5km long and 1km wide and runs parallel to the coast between Clontarf and Sutton. The sediment which forms the island is predominantly glacial in origin and siliceous in nature. A well-developed dune system runs the length of the island, with good examples of embryonic, shifting marram and fixed dunes, as well as excellent examples of humid dune slacks. Extensive salt marshes also occur. Between the island and the mainland occur two sheltered intertidal areas which are separated by a solid causeway constructed in 1964. The seaward side of the island has a fine sandy beach. A substantial area of shallow marine water is included in the site. Part of the interior of the island has been converted to golf courses. The proximity of the North Bull

Island to Dublin City results in it being a very popular recreational area. It is also very important for educational and research purposes. Nature conservation is a main land use within the site.

The site is among the top ten sites for wintering waterfowl in the country. It supports internationally important populations of *Branta bernicila hrota* and *Limosa lapponica* and is the top site in the country for both of these species. A further 14 species have populations of national importance, with particular notable numbers of *Tadorna tadorna* (8.5% of national total), *Anas acuta* (11.6% of national total), *Pluvialis squatarola* (6.9% of national total), *Calidris canutus* (10.5% of national total). North Bull Island SPA is a regular site for passage waders such as *Philomachus pugnax, Calidris ferruginea* and *Tringa erythropus*. The site supports *Asio flammeus* in winter. Formerly the site had an important colony of *Sterna albifrons* but breeding has not occurred in recent years. The site provides both feeding and roosting areas for the waterfowl species. Habitat quality for most of the estuarine habitats is very good. The site has a population of the rare *Petalophyllum ralfsii* which is the only known station away from the western seaboard as well as five Red Data Book vascular plant species and four bryophyte species. It is nationally important for three insect species. Wintering bird populations have been monitored more or less continuously since the late 1960s, and the other scientific interests of the site have also been well documented. Future prospects are good owing to various designations assigned to site.

5.2.4 South Dublin Bay and River Tolka Estuary SPA

This site comprises a substantial part of Dublin Bay. It includes virtually all of the intertidal area in the south bay, as well as much of the Tolka Estuary to the north of the River Liffey. A portion of the shallow bay waters is also included. In the south bay, the intertidal flats extend for almost 3 km at their widest. The sediments are predominantly well-aerated sands. The sands support the largest stand of *Zostera noltii* on the East Coast. Several permanent channels exist, the largest being Cockle Lake. A small sandy beach occurs at Merrion Gates, while some bedrock shore occurs near Dun Laoghaire. The landward boundary is now almost entirely artificially embanked. Sediments in the Tolka Estuary vary from soft thixotrophic muds with a high organic content in the inner estuary to exposed, well aerated sands off the Bull Wall. The proximity of the site to Dublin City results in it being a very popular recreational area. It is also important for educational and research purposes.

The site possesses extensive intertidal flats which support wintering waterfowl which are part of the overall Dublin Bay population. It regularly has an internationally important population of *Branta bernicla hrota*, which feeds on *Zostera noltii* in the autumn. It has nationally important numbers of a further 6 species: *Haematopus ostralegus, Charadrius hiaticula, Calidris canutus, Calidris alba, Calidris alpina* and *Limosa lapponica*. It is an important site for wintering gulls, especially *Larus ridibundus* and *Larus canus*. South Dublin Bay is the premier site in Ireland for *Larus melanocephalus*, with up to 20 birds present at times. Is a regular autumn roosting ground for significant numbers of terns, including *Sterna dougallii, S. hirundo* and S. *paradisaea*.

5.5 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 conservation objectives for the site are detailed in:

- NPWS (2013) *Conservation Objectives: North Dublin Bay SAC 000206. Version 1.* National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
- NPWS (2013) *Conservation Objectives: South Dublin Bay SAC 000210. Version 1.* National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
- NPWS (2015) *Conservation Objectives: North Bull Island SPA 004006. Version 1.* National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
- NPWS (2015) *Conservation Objectives: South Dublin Bay and River Tolka Estuary SPA 004024. 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 favourable conservation status of a species is achieved when population data on the species concerned indicate that it is maintaining itself, and the natural range of the species is neither being reduced or likely to be reduced for the foreseeable future, and there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis. The species and/or habitats listed as features of interests for the South Dublin Bay SAC, North Dublin Bay SAC, North Bull Island SPA and the South Dublin Bay & River Tolka Estuary SPA are included in **Tables 2 to 5**.

Table 2. Features of Interest for North Dublin Bay SAC

Habitat/species Code	Habitat /Species	Conservation objective
1140	Mudflats and sandflats not covered by seawater at low tide	Maintain
1210	Annual vegetation of drift lines	Restore
1310	Salicornia and other annuals colonising mud and sand	Restore
1330	Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)	Maintain
1410	Mediterranean salt meadows (*Juncetalia maritimi*)	Maintain
2110	Embryonic shifting dunes	Restore
2120	Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes)	Restore
2130	Fixed coastal dunes with herbaceous vegetation (grey dunes)	Restore
2190	Humid dune slacks	Restore
1395	Petalwort *Petalophyllum ralfsii*	Maintain

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

Table 3. Features of Interest for South Dublin Bay SAC

Habitat/species Code	Habitat /Species	Conservation objective
1140	Mudflats and sandflats not covered by seawater at low tide	Maintain
1210	Annual vegetation of drift lines	Maintain/Restore
1310	Salicornia and other annuals colonising mud and sand	Maintain/Restore
2110	Embryonic shifting dunes	Maintain/Restore

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

Table 4: Features of Interest for North Bull Island SPA

Species Code	Species	Scientific name	Conservation objective
A046	Brent Goose	*Branta bernicla hrota*	Maintain
A048	Shelduck	*Tadorna tadorna*	Maintain
A052	Teal	*Anas crecca*	Maintain
A054	Pintail	*Anas acuta*	Maintain
A056	Shoveler	*Anas clypeata*	Maintain
A130	Oystercatcher	*Haematopus ostralegus*	Maintain
A140	Golden Plover	*Pluvialis apricaria*	Maintain
A141	Grey Plover	*Pluvialis squatarola*	Maintain
A143	Knot	*Calidris canutus*	Maintain
A144	Sanderling	*Calidris alba*	Maintain
A149	Dunlin	*Calidris alpina alpina*	Maintain
A156	Black-tailed Godwit	*Limosa limosa*	Maintain

Species Code	Species	Scientific name	Conservation objective
A157	Bar-tailed Godwit	*Limosa lapponica*	Maintain
A160	Curlew	*Numenius arquata*	Maintain
A162	Redshank	*Tringa totanus*	Maintain
A169	Turnstone	*Arenaria interpres*	Maintain
A179	Black-headed Gull	*Chroicocephalus ridibundus*	Maintain
A999	Wetlands & waterbirds		Maintain

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

Table 5: Features of Interest for South Dublin Bay & River Tolka Estuary SPA

Species Code	Species	Scientific name	Conservation objective
A046	Brent Goose	*Branta bernicla hrota*	Maintain
A130	Oystercatcher	*Haematopus ostralegus*	Maintain
A137	Ringed Plover	*Charadrius hiaticula*	Maintain
A141	Grey Plover	*Pluvialis squatarola*	Maintain
A143	Knot	*Calidris canutus*	Maintain
A144	Sanderling	*Calidris alba*	Maintain
A149	Dunlin	*Calidris alpina alpina*	Maintain
A157	Bar-tailed Godwit	*Limosa lapponica*	Maintain
A162	Redshank	*Tringa totanus*	Maintain
A179	Black-headed Gull	*Chroicocephalus ridibundus*	Maintain
A192	Roseate Tern	*Sterna dougallii*	Maintain
A193	Common Tern	*Sterna hirundo*	Maintain
A194	Arctic Tern	*Sterna paradisaea*	Maintain
A999	Wetlands & waterbirds		Maintain

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

To acknowledge the importance of Ireland's wetlands to wintering waterbirds, "Wetland and Waterbirds" may be included as a Special Conservation Interest for some SPAs that have been designated for wintering waterbirds and that contain a wetland site of significant importance to one or more of the species of Special Conservation Interest. Thus, a further objective is to maintain or restore the favourable conservation condition of the wetland habitat within the North Bull Island SPA and the South Dublin Bay & River Tolka Estuary SPA as a resource for the regularly occurring migratory waterbirds that utilise them.

It should be noted that some of the Natura 2000 sites overlap each other and thus the conservation objectives for these sites should be used in conjunction with those for overlapping and adjacent sites as appropriate.

6. Water Quality data

6.1 River Basin Management Plan for Ireland 2015 – 2018 (2nd /3rd Cycle)

The Water Framework Directive (WFD) sets out the environmental objectives which are required to be met through the process of river basin 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, 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 watercourses within the study area is provided in **Table 6** and the location of these shown in **Figure 4.**

Treated wastewater from the proposed development site will ultimately be discharged to the transitional waters (Liffey Estuary Lower) / coastal waters (Dublin Bay) via a primary discharge point from the Ringsend WWTP. The 2019 AER for the Ringsend WWTP notes that the discharge from the wastewater treatment plant does not have an observable negative impact on the water quality in the near field of the discharge and in the Liffey and Tolka Estuaries. However, the WFD characterisation process concluded that the Ringsend WWTP is a significant pressure on the Liffey Estuary Lower water body.

The WFD 3rd cycle results have been partially released through the EPA website. These results show that the status of Dublin Bay remains "Not at risk". The Lower River Estuary has status has changed from "At Risk" to "Review" in the 3rd Cycle.

Table 6. WFD Status

Catchment: Liffey and Dublin Bay (Code 9) – 3rd Cycle			
This catchment includes the area drained by the River Liffey and by all streams entering tidal water between Sea Mount and Sorrento Point, Co. Dublin, draining a total area of 1,616km2. The largest urban centre in the catchment is Dublin City. The other main urban centres are Dun Laoghaire, Lucan, Clonee, Dunboyne, Leixlip, Maynooth, Kilcock, Celbridge, Newcastle, Rathcoole, Clane, Kill, Sallins, Johnstown, Naas, Newbridge, Athgarvan, Kilcullen and Blessington. The total population of the catchment is approximately 1,255,000. The Liffey catchment contains the largest population of any catchment in Ireland and is characterised by a sparsely populated, upland south eastern area and a densely populated, flat, low lying area over the remainder of the catchment basin. The Liffey catchment comprises 17 sub-catchments with 77 river water bodies, six lakes, six transitional and five coastal water bodies, and 16 groundwater bodies **Proposed Development Site –** Sub catchment Liffey_SC_090. A predominantly urban sub-catchment as it flows through Dublin City from Lexlip, it displays some of the major issues associated with inefficient drainage systems and problems with misconnections. This is a known major issue for the respective Local Authorities and work is underway to further identify sources of these pressures. Combined sewer overflows have also been identified as a significant pressure in Dublin City Council. This data needs to be reviewed before further work can be prioritised.			
Waterbodies relevant to the proposed project (2nd Cycle)			
Waterbody	WFD Status	Risk	**Pressure Category** **WFD Status**
Camac_040	Poor	At risk	Hydromorphology, Urban runoff, urban wastewater
Liffey Estuary Upper	Good	Review	Urban wastewater
Liffey Estuary Lower	Good	Review	Urban wastewater
Dublin Bay	Good	Not at risk	n/a

Source: EPA envision mapping and www.catchments.ie 22/04/2021

Figure 4. WFD 3rd cycle - waterbodies in the vicinity of the proposed development | Source: EPA Envision mapping | not to scale.

6.2 Urban Wastewater Treatment Directive

The Waste Water Discharge (Authorisation) Regulations 2007 (S.I. 684 of 2007) gives effect to the requirements of the Urban Waste Water Treatment Directive (Directive 91/271/EEC) and the Water Framework Directive (2000/60/EC) in Ireland. The Urban Waste Water Treatment Directive (UWWTD) lays down the requirements for the collection, treatment and discharge of urban waste-water and specifies the quality standards which must be met — based on agglomeration size — before treated waste-water is released into the environment.

The priority objective for this river basin planning cycle is to secure compliance with the Urban Wastewater Treatment Directive and to contribute to the improvement and protection of waters in keeping with the water-quality objectives established by this Plan. Achieving this objective entails addressing waste-water discharges and overflows where protected areas (i.e. designated bathing waters and shellfish waters) or high-status waters are at risk from urban waste-water pressures.

As part of the proposed development wastewater discharging from the proposed development will be conveyed to the Ringsend WWTP (D0034-01) for treatment prior to discharging into the Dublin Bay.

7. Site Surveys

7.1 Habitat survey

A site survey was carried out on the 3rd of June 2021. Habitat mapping was carried out in line with the methodology outlined in the *Best Practice Guidance for Habitat Survey and Mapping* (Heritage Council, 2011). The terrestrial and aquatic habitats within or adjacent to the proposed development site was classified using the classification scheme outlined in the Heritage council publication *A Guide to Habitats in Ireland* (Fossitt, 2000) and cross referenced with Annex I Habitats where required. An overview of the current habitats recorded within the site is shown in **Figure 5** and the habitats recorded on site are described in **Table 7**.

No Annex I habitats were recorded within the proposed development site. No protected species were recorded during the site visits.

Table 7. Habitat recorded within proposed development site

Habitat	Comments
Buildings and artificial surfaces (BL3)	This habitat dominates the proposed development site and includes steel framed sheds and storage yards with adjacent concrete aprons. Occasional ruderal species emerging through cracks in the concrete including Sow Thistle (*Sonchus arvensis*), Figwort (*Artemisia vulgaris*) and Dandelion (*Taraxacum spp*), This habitat is not listed as a qualifying habitat for Natura 2000 sites and does not have any links to Annex I habitats.
Recolonising bare ground (ED3)	This habitat includes consolidated limestone surfaces used as a storage yard and for vehicular access. Annual ruderal and woody perennials are scattered throughout this area, but particularly on the periphery. Species recorded in this area included Nettle (*Urtica dioica*), Figwort, Dandelion, Cocksfoot (*Dactylis glomerata*), Valerian (*Valeriana officinalis*), and Bindweed (*Convolvulus* spp,). Numerous Ash (*Fraxinus excelsior*) saplings located in this area are succumbing to ash dieback disease. Buddleia (*Buddleja davidii*) is regenerating freely on the periphery of this habitat and on adjacent lands. This habitat is not listed as a qualifying habitat for Natura 2000 sites and does not have any links to Annex I habitats.

The proposed development site is dominated by level ground with covered areas i.e. industrial sheds housing steel, sand blasting and painting facilities. The site is surrounded by existing concrete storage yards and hardcore surfaces. This site is part of an extensive industrial complex with additional industrial areas to the north and west. To the south of the site is an area of Amenity grassland (GA2), which surrounds the Newlands Cross Crematorium. To the east is an area of rough grassland/scrub habitat (WS1) and Dry neutral grassland (GS1). A Depositing lowland stream (FW2) emerges approximately 80m south of the site. Running along the southern and eastern perimeter is an area of Mixed Broadleaved Woodland (WD2). This planted strip of woodland which borders the Newlands Cross Crematorium includes Pedunculate Oak (*Quercus robur*), Alder (*Alnus spp.*), Black Cherry (*Prunus serotina*), Birch (*Betula* spp.) and Corsican Pine (*Pinus nigra*).

All habitats within the site are of low ecological value. Habitat outside the red-line boundary, will not be impacted by the proposed development.

7.2 Birds

Common bird species were recorded during the site visit i.e., Blackbird *Turdus merula*, Woodpigeon *Columba palumbus*, Robin *Erithacus rubecula*, Pied Wagtail *Motacilla alba* and Jackdaw *Corvus monedula*. A Skylark *Alauda arvensis* was recorded to the east of the site in marginal grassland habitat. Overall, the proposed development site is of a low local value for terrestrial bird species that are relatively common in the Irish countryside. No species of high conservation status were recorded within the proposed development site. No signs of other significant nesting species were recorded. No birds listed as SCIs for the North Bull Island SPA or South Dublin Bay SPA were recorded and there is no habitat suitable for these species within the proposed development site.

7.3 Invasive Species

Non-native species are defined as those species which have been introduced outside of their native range by humans and their activities, either purposefully or accidentally. Invasive non-native species are so-called as they typically display one or more of the following characteristics or features: (1) prolific reproduction through seed dispersal and/or re-growth from plant fragments; (2) rapid growth patterns; and, (3) resistance to standard weed control methods.

The control of invasive species in Ireland comes under the Wildlife (Amendment) Act 2000, where it states that

'Any person who— [...] plants or otherwise causes to grow in a wild state in any place in the State any species of flora, or the flowers, roots, seeds or spores of flora, ['refers only to exotic species thereof'][...] otherwise than under and in accordance with a licence granted in that behalf by the Minister shall be guilty of an offence.'

The Birds and Natural Habitats Regulations 2011 (SI 477 of 2011), Section 49(2) prohibits the introduction and dispersal of species listed in the Third Schedule, which includes Japanese Knotweed and Himalayan Balsam, as follows: "any person who plants, disperses, allows or causes to disperse, spreads or otherwise causes to grow [....] shall be guilty of an offence."

The NBDC lists a number of high impact invasive species which have been recorded within grid square O03 (**Table 8**).

Table 8. NBDC list of high impact invasive species.

Common Name	Latin Name
American Mink	*Mustela vison*
Brown Rat	*Rattus norvegicus*
Canadian Waterweed	*Elodea canadensis*
Cherry Laurel	*Prunus laurocerasus*
Eastern Grey Squirrel	*Sciurus carolinensis*
Fallow Deer	*Dama dama*

Common Name	Latin Name
Feral Ferret	*Mustela furo*
Giant Hogweed	*Heracleum mantegazzianum*
Harlequin Ladybird	*Harmonia axyridis*
House Mouse	*Mus musculus*
House Mouse	*Mus musculus*
Indian Balsam	*Impatiens glandulifera*
Japanese Knotweed	*Fallopia japonica*
New Zeeland Flatworm	Arthurdendyus triangulatus
Nuttall's Waterweed	*Elodea nuttallii*
Rhododendron ponticum	
Siberian Chipmunk	*Tamias sibiricus*
Sika Deer	*Cervus nippon*

Source NBDC 05/07/21

No Third Schedule invasive species were recorded within the proposed development. The Medium Impact Invasive species Buddleia (*Buddleja davidii)* was recorded on the periphery of the site. This species is listed on the Invasive Species Ireland *"Amber List: Recorded Species"* (which under the right conditions could represent a significant impact on native species or habitats). Buddleia is also included in the *NRA Guidelines on the Management of Noxious Weeds and Non-native Species on National Roads* (NRA, 2010) as these species have been shown to have an adverse impact on landscape quality, native biodiversity or infrastructure.

8. Potential Impacts

All potential impacts would relate to direct and indirect impacts to relevant habitats and fauna of the South Dublin Bay SAC, North Dublin Bay SAC, North Bull Island SPA and the South Dublin Bay & River Tolka Estuary SPA. Impacts are based on the EC (2018), professional judgement and criteria or standards where available.

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 in-combination 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.

As part of the assessment the potential for impacts associated with the development were reviewed as outlined below:

- Loss of habitat
- Impacts from noise and disturbance
- Potential impacts of surface water run-off

- Potential impacts from wastewater discharges
- Spread of invasive species
- In-combination Impacts

8.1 Loss of habitat

The proposed development site is not located within a designated site. The habitats recorded within the proposed development site do not correspond to habitats listed on Annex I of the Habitats Directive or to qualifying habitats for the South Dublin Bay SAC and North Dublin Bay SAC. The habitats within the proposed development area are considered of a low value at a local level and are relatively common in the surrounding landscape.

The habitats within the development area may be utilised on occasions by common birds for feeding, however the area to be affected is not likely to be a critical feeding resource for these species in the context of the wider landscape.

The manmade habitats onsite do not provide foraging or roosting habitat for SCI species of North Bull Island SPA and the South Dublin Bay & River Tolka Estuary SPA. Therefore, the proposed development will not result in any significant deterioration in habitat quality or loss of habitat within the North Bull Island SPA and the South Dublin Bay & River Tolka Estuary SPA.

The proposed development will not result in any loss of habitat within Natura 2000 sites. The manmade habitats onsite are considered of low value at a local level and are common in the surrounding landscape. No potential for habitat fragmentation has been identified. Thus no effects on the qualifying interests and conservation of objectives of Natura 2000 site due to habitat loss will occur.

8.2 Impacts from noise and disturbance

Potentially increased noise and disturbance associated with the site works could cause disturbance/displacement of fauna. If of sufficient severity, there could be impacts on reproductive success.

The potential effects and impacts of disturbance have been widely recognised in wildlife conservation legislation, as has the need to develop conservation measures for birds whilst taking human activities into account. Article 4.4 of the Bird's Directive (79/409/EEC) requires member states to "*take appropriate steps to avoid... any disturbances affecting the birds, in so far as these would be significant having regard to the objectives of this Article*". This specifically relates to conservation measures concerning Annex I species.

The wintering birds listed as qualifying interests for the North Bull Island SPA and the South Dublin Bay & River Tolka Estuary SPA are strongly associated with estuarine shoreline areas or wetlands. However, as resources within the SPAs becomes depleted later in the winter, a some of bird species, most notably Brent Geese, switch from inter-tidal foraging to inland feeding on amenity grassland. The majority of these grassland sites are in proximity to the SPAs however Brent Goose have been recorded up to 13.8km inland (Le Fanu Park, Ballyfermot approximately 3.7km northeast of proposed development site). No wetland or grassland habitat suitable for inland foraging is present within the footprint of the proposed development. The proposed development site is located within and adjacent to an existing

industrial site. A small area of amenity grassland was recorded outside the site boundary, however there are no records that Brent Goose or other waders use this area. Any birds which use grassland habitats in the vicinity of the site would already habituated to existing industrial activity in the vicinity.

Given the scale and temporary nature of the works, the existing industrial activity at the site, the manmade habitats onsite and from SPAs no effect on bird populations listed as qualifying interests for relevant SPAs is predicted to occur. No impact on any Natura 2000 sites is predicted to occur due to noise and disturbance.

8.3. Potential Impacts of Surface Water Run-off

Potential impacts on aquatic habitats which can arise from this type of development include increased silt levels in surface water run-off, inadvertent spillages of hydrocarbons from fuel and hydraulic fluid and increased nutrients from treated wastewater.

High levels of silt in surface water run-off from the storage areas, can impact in particular on fish species, in particular salmonids. If of sufficient severity, adult fish could theoretically be affected by increased silt levels as gills may become damaged by exposure to elevated suspended solids levels. If of sufficient severity, aquatic invertebrates may be smothered by excessive deposits of silt from suspended solids. In areas of stony substrate, silt deposits may result in a change in the macro-invertebrate species composition, favouring less diverse assemblages and impacting on sensitive species. Aquatic plant communities may also be affected by increased siltation. Submerged plants may be stunted and photosynthesis may be reduced.

Elevated silt levels could theoretically, if of sufficient magnitude, result in changes in the ecology of receiving waters. The risk of significant silt levels being deposited within nearby watercourses during the construction phase of the development is considered low and due to the dilution provided in the estuarine environment and naturally fluctuating levels of silt impacts are only likely to arise from extremely severe levels of siltation. Likewise given the location of the works, the distance of the proposed development from the estuarine environment (14.6km upstream), the robust nature of qualifying habitats (e.g. Mudflats and sandflats not covered by seawater at low tide [1140], Salicornia and other annuals colonising mud and sand [1310], Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330], Mediterranean salt meadows) and the dilution provided in the estuarine/marine environment, no impacts on water quality within European sites due to elevated silt levels during construction will occur.

Inadvertent spillages of hydrocarbons, silt or other chemicals during construction could introduce toxic chemicals into the aquatic environment via surface water run-off and have a direct toxicological impact on habitats and fauna. However, given the small scale of proposed works, the distance from estuarine/marine environment, the robust nature of qualifying habitats and the dilution provided in the estuarine/marine environment no impacts on water quality within European sites due to such spills will occur.

As noted in **Section 3.2** the proposed development is minor in scale. There will be no new emissions to air or water during the operational phase of the proposed development. Stormwater run-off will tie into the existing stormwater management network on site. Significant effects as a result of surface water runoff during the operational phase of the proposed development, on European sites or otherwise, can therefore be excluded.

Overall, no impact on water quality within European sites during construction or operation is predicted to occur. The construction and operational stage of the proposed development will not impact surface water quality or affect conservation objectives of the South Dublin Bay SAC, North Dublin Bay SAC, North Bull Island SPA and the South Dublin Bay & River Tolka Estuary SPA.

8.4 Potential Increase in the Discharges from Ringsend WWTP

Once constructed surface and wastewater from the proposed development will be conveyed for treatment to Ringsend WWTP and ultimately discharged to the Liffey Estuary.

However as noted the in **Section 3.2**, the new toilet facilities will match the size of the existing arrangement. Therefore, the proposed development will not increase the foul load on the existing foul sewer and there will be no impact on Natura 2000 sites as a result of foul discharges during the operational phase.

8.5 Spread of Invasive Species

No third schedule invasive species were recorded within the proposed development. It is noted that following best practice guidance any amber listed invasive species i.e. Buddleia found on site will be removed through standard eradication/control methods including digging out and post construction herbicide treatment if necessary. However, even in the absence of removal this invasive species cannot colonise the estuarine/marine habitats for which the South Dublin Bay and North Dublin Bay SAC's are designated. Therefore, no potential impacts from invasive species on Natura 2000 sites will occur.

8.6 In-combination Impacts

In-combination impacts refer to a series of individually impacts that may, in combination, produce a significant impact. The underlying intention of this in combination provision is to take account of in-combination impacts from existing or proposed plans and projects and these will often only occur over time.

High negative threats, pressures and activities identified for the South Dublin Bay SAC, North Dublin Bay SAC, North Bull Island SPA and the South Dublin Bay & River Tolka Estuary SPA include roads and motorways, bridges, shipping, urbanised areas, industrial or commercial development, walking, horse-riding, golf courses, land reclamation and accumulation of organic material.

Other developments near the proposed development site and their potential in-combination impacts are listed in **Table 9.**

Table 9. Other developments near site and potential in-combination impacts

Plans and Projects	Key Policies/Issues/Objectives Directly Related to the Conservation of the Natura 2000 Network	Impact
River Basin Management Plan 2018-2021	The project should comply with the environmental objectives of the Irish RBMP which are to be achieved generally by 2021. • Ensure full compliance with relevant EU legislation • Prevent deterioration • Meeting the objectives for designated protected areas • Protect high status waters • Implement targeted actions and pilot schemes in focus sub-catchments aimed at: targeting water bodies close to meeting their objective and addressing more complex issues which will build knowledge for the third cycle.	The implementation and compliance with key environmental policies, issues and objectives of this management plan will result in positive in-combination effects to European sites. The implementation of this plan will have a positive impact for the biodiversity. It will not contribute to in-combination or cumulative impacts with the proposed development.
Inland Fisheries Ireland Corporate Plan 2016 -2020	To ensure that Ireland's fish populations are managed and protected to ensure their conservation status remains favourable. That they provide a basis for a sustainable world class recreational angling product, and that pristine aquatic habitats are also enjoyed for other recreational uses. To develop and improve fish habitats and ensure that the conditions required for fish populations to thrive are sustained and protected. To grow the number of anglers and ensure the needs of IFI's other key stakeholders are being met in a sustainable conservation focused manner. EU (Quality of Salmonid Waters) Regulations 1988. All works during development and operation of the	The implementation and compliance with key environmental issues and objectives of this corporate plan will result in positive on-combination effects to European sites. The implementation of this corporate plan will have a positive impact for biodiversity of inland fisheries and ecosystems. It will not contribute to in-combination or cumulative impacts with the proposed works.

Plans and Projects	Key Policies/Issues/Objectives Directly Related to the Conservation of the Natura 2000 Network	Impact
	project must aim to conserve fish and other species of fauna and flora habitat; biodiversity of inland fisheries and ecosystems and protect spawning salmon and trout.	
Irish Water Capital Investment Plan 2014-2016	Proposals to upgrade and secure water services and water treatment services countrywide.	Likely net positive impact due to water conservation and more effective treatment of water.
Water Services Strategic Plan (WSSP, 2015)	Irish Water has prepared a Water Services Strategic Plan (WSSP, 2015), under Section 33 of the Water Service No. 2 Act of 2013 to address the delivery of strategic objectives which will contribute towards improved water quality and biodiversity requirements through reducing: • Habitat loss and disturbance from new / upgraded infrastructure; • Species disturbance; • Changes to water quality or quantity; and Nutrient enrichment /eutrophication.	The WSSP forms the highest tier of asset management plans (Tier 1) which Irish Water prepare and it sets the overarching framework for subsequent detailed implementation plans (Tier 2) and water services projects (Tier 3). The WSSP also sets out the strategic objectives against which the Irish Water Capital Investment Programme is developed. The current version of the CAP outlines the proposals for capital expenditure in terms of upgrades and new builds within the Irish Water owned assets. Therefore, no adverse significant in-combination effects are envisaged.
NPWS Conservation Management Plans	Conservation Management Plans have not been fully prepared for the European sites being assessed. However, conservation objectives are set for all sites.	The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. A site-specific conservation objective aims to define favourable conservation condition for a particular habitat or species at that site. 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. The resultant effects of conservation objectives are a net positive and there is no potential

Plans and Projects	Key Policies/Issues/Objectives Directly Related to the Conservation of the Natura 2000 Network	Impact
		for in combination effects on European sites.
WWTP discharges	Ringsend WWTP is the primary WWTP in Greater Dublin area	Discharges from municipal WWTPs are required to meet water quality standards. Irish Water Capital Investment Plan proposes to upgrade water treatment services countrywide (see above). The long-term cumulative impact is predicted to be negligible.
Commercial and Residential Applications Under consideration	A review of the South Dublin County Council Planning system indicted that there was one recent planning applications within the vicinity of the proposed development site: Alstom Transport Ireland Ltd. Luas Depot, Red Cow, Clondalkin, Dublin 22 Proposed Development: Retention of 3 standalone coated steel prefabricated units comprising of 2 single storey prefabricated units (each c.31sq.m GFA) and associated entrance ramps used for canteen and welfare use respectively; 1 single storey prefabricated modular unit (c.199sq.m GFA) and associated entrance ramp used for office use; all site development works are proposed on a site of c.0.245ha.	Future developments will only be granted permission where discharges from same meet with relevant water quality standards. The long-term cumulative impact is predicted to be negligible.

The potential for the proposed development to indirectly impact the South Dublin Bay SAC, North Dublin Bay SAC, North Bull Island SPA and the South Dublin Bay & River Tolka Estuary SPA has been assessed. Potential in-combination impacts on the sites may arise owing to an alteration to water quality or quantity. Deterioration in water quality can occur as an indirect consequence of point source or diffuse pollution, which in turn changes the aquatic environment and reduces its capacity to support certain plants and animals. This leads to potential negative consequences for the qualifying interests that rely on the maintenance of water quality within the Natura 2000 site.

The area surrounding the proposed development is also heavily populated with a mixture of residential apartments, commercial units and roads. Wastewater is also discharged from local settlements and industry. However, in the absence of any significant impact associated with this project no in-combination impacts on water quality have been identified. Similarly, no significant in-combination impacts in relation to noise and disturbance have been identified.

9. Screening conclusion and statement

This AA screening report has been prepared to assess whether the proposed development, individually or in-combination with other plans or projects, and in view of best scientific knowledge, is likely to have a significant effect on any European site(s).

The screening exercise was completed in compliance with the relevant European Commission guidance, national guidance, and case law. The potential impacts of the proposed development have been considered in the context of the European sites potentially affected, their qualifying interests or special conservation interests, and their conservation objectives.

Through an assessment of the source-pathway-receptor model, which considered the ZoI of effects from the proposed development and the potential in-combination effects with other plans or projects, the following findings were reported:

The proposed development at Heiton Steel, Ashfield, Co. Dublin either alone or in-combination with other plans and/or projects, does not have the potential to significantly affect any European Site, in light of their conservation objectives.

Therefore, a Stage 2 Appropriate Assessment is deemed not to be required.

References

Benson, L. (2009). Use of inland feeding sites by Light-bellied Brent geese in Dublin 2008 – 2009: a new conservation concern? Irish Birds 8, 563-570..

Environmental Protection Agency Ireland (http://www.epa.ie/): Accessed 05/07/21

Fossitt, J. A. (2000). A Guide to Habitats in Ireland. The Heritage Council of Ireland Series

Inger, R., Bearhop, S., Robinson, J.A. & Ruxton, G. (2006) Prey choice affects the trade-off balance between predation and starvation in an avian herbivore. Animal Behaviour 71, 1335-1341..

Invasive Species Ireland (http://invasivespeciesireland.com/): Accessed 05/07/21

Irish Water (2019). Annual Environmental Report for Ringsend WWTP D0034-01.

National Biodiversity Data Centre (http://www.biodiversityireland.ie/): Accessed 05/07/21

National Parks and Wildlife Service website (www.npws.ie) : Accessed 05/07/21

NPWS (2013a) Conservation Objectives: North Dublin Bay SAC 000206. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2013b) Conservation Objectives: South Dublin Bay SAC 000210. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2013c) The Status of EU Protected Habitats and Species in Ireland. Habitat Assessments Volume 2. Version 1.1. Unpublished Report, National Parks & Wildlife Services. Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland

NPWS (2015a) Conservation Objectives: North Bull Island SPA 004006. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2015b) Conservation Objectives: South Dublin Bay and River Tolka Estuary SPA 004024. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

Scott Cawley (2017) Natura Impact Statement – Information for Stage 2 Approriate Assessment. Proposed Residential Development St. Paul's College, Sybil Hill, Raheny, Dublin 5. Scott Cawley Ltd., Dublin

Appendices

Appendix 1. Natura 2000 Site Synopses

Site Name: North Dublin Bay SAC

Site Code: 000206

This site covers the inner part of north Dublin Bay, the seaward boundary extending from the Bull Wall lighthouse across to the Martello Tower at Howth Head. The North Bull Island is the focal point of this site.

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
- [1210] Annual Vegetation of Drift Lines
- [1310] Salicornia Mud
- [1330] Atlantic Salt Meadows
- [1410] Mediterranean Salt Meadows
- [2110] Embryonic Shifting Dunes
- [2120] Marram Dunes (White Dunes)
- [2130] Fixed Dunes (Grey Dunes)*
- [2190] Humid Dune Slacks
- [1395] Petalwort (Petalophyllum ralfsii)

North Bull Island is a sandy spit which formed after the building of the South Wall and Bull Wall in the 18th and 19th centuries. It now extends for about 5 km in length and is up to 1 km wide in places. A well-developed and dynamic dune system stretches along the seaward side of the island. Various types of dunes occur, from fixed dune grassland to pioneer communities on foredunes. Marram Grass (Ammophila arenaria) is dominant on the outer dune ridges, with Lyme-grass (Leymus arenarius) and Sand Couch (Elymus farctus) on the foredunes. Behind the first dune ridge, plant diversity increases with the appearance of such species as Wild Pansy (Viola tricolor), Kidney Vetch (Anthyllis vulneraria), Common Bird's-foot-trefoil (Lotus corniculatus), Common Restharrow (Ononis repens), Yellow-rattle (Rhinanthus minor) and Pyramidal Orchid (Anacamptis pyramidalis). In these grassy areas and slacks, the scarce Bee Orchid (Ophrys apifera) occurs.

About 1 km from the tip of the island, a large dune slack with a rich flora occurs, usually referred to as the 'Alder Marsh' because of the presence of Alder trees (Alnus glutinosa). The water table is very near the surface and is only slightly brackish. Saltmarsh Rush (Juncus maritimus) is the dominant species, with Meadowsweet (Filipendula ulmaria) and Devil's-bit Scabious (Succisa pratensis) being frequent. The orchid flora is notable and includes Marsh Helleborine (Epipactis palustris), Common Twayblade (Listera ovata), Autumn Lady's-tresses (Spiranthes spiralis) and Marsh Orchids (Dactylorhiza spp.).

Saltmarsh extends along the length of the landward side of the island. The edge of the marsh is marked by an eroding edge which varies from 20 cm to 60 cm high. The marsh can be zoned into different levels according to the vegetation types present. On the lower marsh, Glasswort (Salicornia europaea), Common Saltmarsh-grass (Puccinellia maritima), Annual Sea-blite (Suaeda maritima) and Greater Sea-spurrey (Spergularia media) are the main species. Higher up in the middle marsh Sea Plantain (Plantago maritima), Sea Aster (Aster tripolium), Sea Arrowgrass (Triglochin maritima) and Thrift (Armeria maritima) appear. Above the mark of the normal high tide,

species such as Common Scurvygrass (Cochlearia officinalis) and Sea Milkwort (Glaux maritima) are found, while on the extreme upper marsh, the rushes Juncus maritimus and J. gerardi are dominant. Towards the tip of the island, the saltmarsh grades naturally into fixed dune vegetation.

The habitat 'annual vegetation of drift lines' is found in places, along the length of Dollymount Strand, with species such as Sea Rocket (Cakile maritima), Oraches (Atriplex spp.) and Prickly Saltwort (Salsola kali).

The island shelters two intertidal lagoons which are divided by a solid causeway. The sediments of the lagoons are mainly sands with a small and varying mixture of silt and clay. The north lagoon has an area known as the "Salicornia flat", which is dominated by Salicornia dolichostachya, a pioneer glasswort species, and covers about 25 ha. Beaked Tasselweed (Ruppia maritima) occurs in this area, along with some Narrow-leaved Eelgrass (Zostera angustifolia). Dwarf Eelgrass (Z. noltii) also occurs in Sutton Creek. Common Cordgrass (Spartina anglica) occurs in places but its growth is controlled by management. Green algal mats (Enteromorpha spp., Ulva lactuca) cover large areas of the flats during summer. These sediments have a rich macrofauna, with high densities of Lugworms (Arenicola marina) in parts of the north lagoon. Mussels (Mytilus edulis) occur in places, along with bivalves such as Cerastoderma edule, Macoma balthica and Scrobicularia plana. The small gastropod Hydrobia ulvae occurs in high densities in places, while the crustaceans Corophium volutator and Carcinus maenas are common. The sediments on the seaward side of North Bull Island are mostly sands. The site extends below the low spring tide mark to include an area of the sublittoral zone.

Three rare plant species which are legally protected under the Flora (Protection) Order, 1999 have been recorded on the North Bull Island. These are Lesser Centaury (Centaurium pulchellum), Red Hemp-nettle (Galeopsis angustifolia) and Meadow Saxifrage (Saxifraga granulata). Two further species listed as threatened in the Red Data Book, Wild Clary/Sage (Salvia verbenaca) and Spring Vetch (Vicia lathyroides), have also been recorded. A rare liverwort, Petalophyllum ralfsii, was first recorded from the North Bull Island in 1874 and has recently been confirmed as still present. This species is of high conservation value as it is listed on Annex II of the E.U. Habitats Directive. The North Bull is the only known extant site for the species in Ireland away from the western seaboard.

North Dublin Bay is of international importance for waterfowl. During the 1994/95 to 1996/97 period the following species occurred in internationally important numbers (figures are average maxima): Brent Goose 2,333; Knot 4,423; Bar-tailed Godwit 1,586. A further 14 species occurred in nationally important concentrations - Shelduck 1505; Wigeon 1,166; Teal 1,512; Pintail 334; Shoveler 239; Oystercatcher 2,190; Ringed Plover 346; Grey Plover 816; Sanderling 357; Dunlin 6,238; Black-tailed Godwit 156; Curlew 1,193; Turnstone 197 and Redshank 1,175. Some of these species frequent South Dublin Bay and the River Tolka Estuary for feeding and/or roosting purposes (mostly Brent Goose, Oystercatcher, Ringed Plover, Sanderling and Dunlin).

The tip of the North Bull Island is a traditional nesting site for Little Tern. A high total of 88 pairs nested in 1987. However, nesting attempts have not been successful since the early 1990s. Ringed Plover, Shelduck, Mallard, Skylark, Meadow Pipit and Stonechat also nest. A well-known population of Irish Hare is resident on the island.

The invertebrates of the North Bull Island have been studied and the island has been shown to contain at least seven species of regional or national importance in Ireland (from the Orders Diptera, Hymenoptera and Hemiptera).

The main land uses of this site are amenity activities and nature conservation. The North Bull Island is the main recreational beach in Co. Dublin and is used throughout the year. Much of the land surface of the island is taken up by two golf courses. Two separate Statutory Nature Reserves cover much of the island east of the Bull Wall and the surrrounding intertidal flats. The site is used regularly for educational purposes. North Bull Island has been designated a Special Protection Area under the E.U. Birds Directive and it is also a statutory Wildfowl Sanctuary, a Ramsar Convention site, a Biogenetic Reserve, a Biosphere Reserve and a Special Area Amenity Order site.

This site is an excellent example of a coastal site with all the main habitats represented. The site holds good examples of nine habitats that are listed on Annex I of the E.U. Habitats Directive; one of these is listed with priority status. Several of the wintering bird species have populations of international importance, while some of the invertebrates are of national importance. The site contains a numbers of rare and scarce plants including some

which are legally protected. Its proximity to the capital city makes North Dublin Bay an excellent site for educational studies and research.

Site Name: South Dublin Bay SAC

Site Code: 000210

This site lies south of the River Liffey in Co. Dublin, and extends from the South Wall to the west pier at Dun Laoghaire. It is an intertidal site with extensive areas of sand and mudflats. The sediments are predominantly sands but grade to sandy muds near the shore at Merrion Gates. The main channel which drains the area is Cockle Lake.

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
- [1210] Annual vegetation of drift lines
- [1310] Salicornia and other annuals colonising mud and sand
- [2110] Embryonic shifting dunes

The bed of Dward Eelgrass (Zostera noltii) found below Merrion Gates is the largest stand on the east coast. Green algae (Enteromorpha spp. and Ulva lactuca) are distributed throughout the area at a low density. Fucoid algae occur on the rocky shore in the Maretimo to Dún Laoghaire area. Species include Fucus spiralis, F. vesiculosus, F. serratus, Ascophyllum nodosum and Pelvetia canaliculata.

Several small, sandy beaches with incipient dune formation occur in the northern and western sectors of the site, notably at Poolbeg, Irishtown and Merrion/ Booterstown. The formation at Booterstown is very recent. Drift line vegetation occurs in association with the embryonic and incipient fore dunes. Typically drift lines occur in a band approximately 5 m wide, though at Booterstown this zone is wider in places. The habitat occurs just above the High Water Mark and below the area of embryonic dune. Species present are Sea Rocket (Cakile maritima), Frosted Orache (Atriplex laciniata), Spear-leaved Orache (A. prostrata), Prickly Saltwort (Salsola kali) and Fat Hen (Chenopodium album). Also occurring is Sea Sandwort (Honkenya peploides), Sea Beet (Beta vulgaris subsp. maritima) and Annual Sea-blite (Suaeda maritima). A small area of pioneer saltmarsh now occurs in the lee of an embryonic sand dune just north of Booterstown Station. This early stage of saltmarsh development is here characterised by the presence of pioneer stands of glassworts (Salicornia spp.) occurring below an area of drift line vegetation. As this is of very recent origin, it covers a small area but ample areas of substrate and shelter are available for the further development of this habitat.

Lugworm (Arenicola marina), Cockles (Cerastoderma edule) and annelids and other bivalves are frequent throughout the site. The small gastropod Hydrobia ulvae occurs on the muddy sands off Merrion Gates.

South Dublin Bay is an important site for waterfowl. Although birds regularly commute between the south bay and the north bay, recent studies have shown that certain populations which occur in the south bay spend most of their time there. The principal species are Oystercatcher (1215), Ringed Plover (120), Sanderling (344), Dunlin (2628) and Redshank (356) (average winter peaks 1996/97 and 1997/98). Up to 100 Turnstones are usual in the south bay during winter. Brent Goose regularly occur in numbers of international importance (average peak 299). Bar-tailed Godwit (565), a species listed on Annex I of the E.U. Birds Directive, also occur.

Large numbers of gulls roost in South Dublin Bay, e.g. 4,500 Black-headed Gulls in February 1990; 500 Common Gulls in February 1991. It is also an important tern roost in the autumn, regularly holding 2000-3000 terns including Roseate Terns, a species listed on Annex I of the E.U. Birds Directive. South Dublin Bay is largely protected as a Special Protection Area.

At low tide the inner parts of the south bay are used for amenity purposes. Baitdigging is a regular activity on the sandy flats. At high tide some areas have windsurfing and jet-skiing.

This site is a fine example of a coastal system, with extensive sand and mudflats, and incipient dune formations. South Dublin Bay is also an internationally important bird site.

Site Name: South Dublin Bay and River Tolka Estuary SPA

Site Code: 004024

The South Dublin Bay and River Tolka Estuary SPA comprises a substantial part of Dublin Bay. It includes the intertidal area between the River Liffey and Dun Laoghaire, and the estuary of the River Tolka to the north of the River Liffey, as well as Booterstown Marsh. A portion of the shallow marine waters of the bay is also included.

In the south bay, the intertidal flats extend for almost 3 km at their widest. The sediments are predominantly well-aerated sands. Several permanent channels exist, the largest being Cockle Lake. A small sandy beach occurs at Merrion Gates, while some bedrock shore occurs near Dun Laoghaire. The landward boundary is now almost entirely artificially embanked. There is a bed of Dwarf Eelgrass (Zostera noltii) below Merrion Gates which is the largest stand on the east coast. Green algae (Ulva spp.) are distributed throughout the area at a low density. The macroinvertebrate fauna is well-developed, and is characterised by annelids such as Lugworm (Arenicola marina), Nephthys spp. and Sand Mason (Lanice conchilega), and bivalves, especially Cockle (Cerastoderma edule) and Baltic Tellin (Macoma balthica). The small gastropod Spire Shell (Hydrobia ulvae) occurs on the muddy sands off Merrion Gates, along with the crustacean Corophium volutator. Sediments in the Tolka Estuary vary from soft thixotrophic muds with a high organic content in the inner estuary to exposed, well-aerated sands off the Bull Wall. The site includes Booterstown Marsh, an enclosed area of saltmarsh and muds that is cut off from the sea by the Dublin/Wexford railway line, being linked only by a channel to the east, the Nutley stream. Sea water incursions into the marsh occur along this stream at high tide. An area of grassland at Poolbeg, north of Irishtown Nature Park, is also included in the site.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Light-bellied Brent Goose, Oystercatcher, Ringed Plover, Grey Plover, Knot, Sanderling, Dunlin, Bar-tailed Godwit, Redshank, Black-headed Gull, Roseate Tern, Common Tern and Arctic Tern. The E.U. Birds Directive pays particular attention to wetlands, and as these form part of the SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

The site is an important site for wintering waterfowl, being an integral part of the internationally important Dublin Bay complex – all counts for wintering waterbirds are five year mean peaks for the period 1995/96 to 1999/2000. Although birds regularly commute between the south bay and the north bay, recent studies have shown that certain populations which occur in the south bay spend most of their time there. An internationally important population of Light-bellied Brent Goose (368) occurs regularly and newly arrived birds in the autumn feed on the Eelgrass bed at Merrion. At the time of designation the site supported nationally important numbers of a further nine species: Oystercatcher (1,145), Ringed Plover (161), Grey Plover (45), Knot (548), Sanderling (321), Dunlin (1,923), Bar-tailed Godwit (766), Redshank (260) and Black-headed Gull (3,040). Other species occurring in smaller numbers include Great Crested Grebe (21), Curlew (127) and Turnstone (52). Little Egret, a species which has recently colonised Ireland, also occurs at this site.

South Dublin Bay is a significant site for wintering gulls, with a nationally important population of Black-headed Gull, but also Common Gull (330) and Herring Gull (348). Mediterranean Gull is also recorded from here, occurring through much of the year, but especially in late winter/spring and again in late summer into winter.

Both Common Tern and Arctic Tern breed in Dublin Docks, on a man-made mooring structure known as the E.S.B. dolphin – this is included within the site. Small numbers of Common Tern and Arctic Tern were recorded nesting on this dolphin in the 1980s. A survey in 1995 recorded nationally important numbers of Common Tern nesting here (52 pairs). The breeding population of Common Tern at this site has increased, with 216 pairs recorded in

2000. This increase was largely due to the ongoing management of the site for breeding terns. More recent data highlights this site as one of the most important Common Tern sites in the country with over 400 pairs recorded here in 2007.

South Dublin Bay is an important staging/passage site for a number of tern species in the autumn (mostly late July to September). The origin of many of the birds is likely to be the Dublin breeding sites (Rockabill and the Dublin Docks) though numbers suggest that the site is also used by birds from other sites, perhaps outside the state. This site is selected for designation for its autumn tern populations: Roseate Tern (2,000 in 1999), Common Tern (5,000 in 1999) and Arctic Tern (20,000 in 1996).

The South Dublin Bay and River Tolka Estuary SPA is of ornithological importance as it supports an internationally important population of Light-bellied Brent Goose and nationally important populations of a further nine wintering species. Furthermore, the site supports a nationally important colony of breeding Common Tern and is an internationally important passage/staging site for three tern species. It is of note that four of the species that regularly occur at this site are listed on Annex I of the E.U. Birds Directive, i.e. Bar-tailed Godwit, Common Tern, Arctic Tern and Roseate Tern. Sandymount Strand/Tolka Estuary is also a Ramsar Convention site.

Site Name: North Bull Island SPA

Site Code: 004006

This site covers all of the inner part of north Dublin Bay, with the seaward boundary extending from the Bull Wall lighthouse across to Drumleck Point at Howth Head. The North Bull Island sand spit is a relatively recent depositional feature, formed as a result of improvements to Dublin Port during the 18th and 19th centuries. It is almost 5 km long and 1 km wide and runs parallel to the coast between Clontarf and Sutton. Part of the interior of the island has been converted to golf courses.

Saltmarsh extends along the length of the landward side of the island and provides the main roost site for wintering birds in Dublin Bay. The island shelters two intertidal lagoons which are divided by a solid causeway. These lagoons provide the main feeding grounds for the wintering waterfowl. The sediments of the lagoons are mainly sands with a small and varying mixture of silt and clay. Green algal mats (Ulva spp.) are a feature of the flats during summer. These sediments have a rich macro-invertebrate fauna, with high densities of Lugworm (Arenicola marina) and Ragworm (Hediste diversicolor).

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Light-bellied Brent Goose, Shelduck, Teal, Pintail, Shoveler, Oystercatcher, Golden Plover, Grey Plover, Knot, Sanderling, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Turnstone and Black-headed Gull. 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.

The North Bull Island SPA is of international importance for waterfowl on the basis that it regularly supports in excess of 20,000 waterfowl. The site supports internationally important populations of three species, Light-bellied Brent Goose (1,548), Black-tailed Godwit (367) and Bar-tailed Godwit (1,529) - all figures are mean peaks for the five winters between 1995/96 and 1999/2000. The site is one of the most important in the country for Light-bellied Brent Goose. A further 14 species have populations of national importance – Shelduck (1,259), Teal (953), Pintail (233), Shoveler (141), Oystercatcher (1,784), Grey Plover (517), Golden Plover (2,033), Knot (2,837), Sanderling (141), Dunlin (4,146), Curlew (937), Redshank (1,431), Turnstone (157) and Black-headed Gull (2,196). The populations of Pintail and Knot are of particular note as they comprise 14% and 10% respectively of the all-Ireland population totals. Other species that occur regularly in winter include Grey Heron, Little Egret, Cormorant, Wigeon, Goldeneye, Red-breasted Merganser, Ringed Plover and Greenshank. Gulls are a feature of the site during winter and, along with the nationally important population of Black-headed Gull (2,196), other species that occur include Common Gull (332) and Herring Gull (331). While some of the birds also frequent South Dublin Bay and the River Tolka Estuary for feeding and/or roosting purposes, the majority remain within the site for much of the winter. The

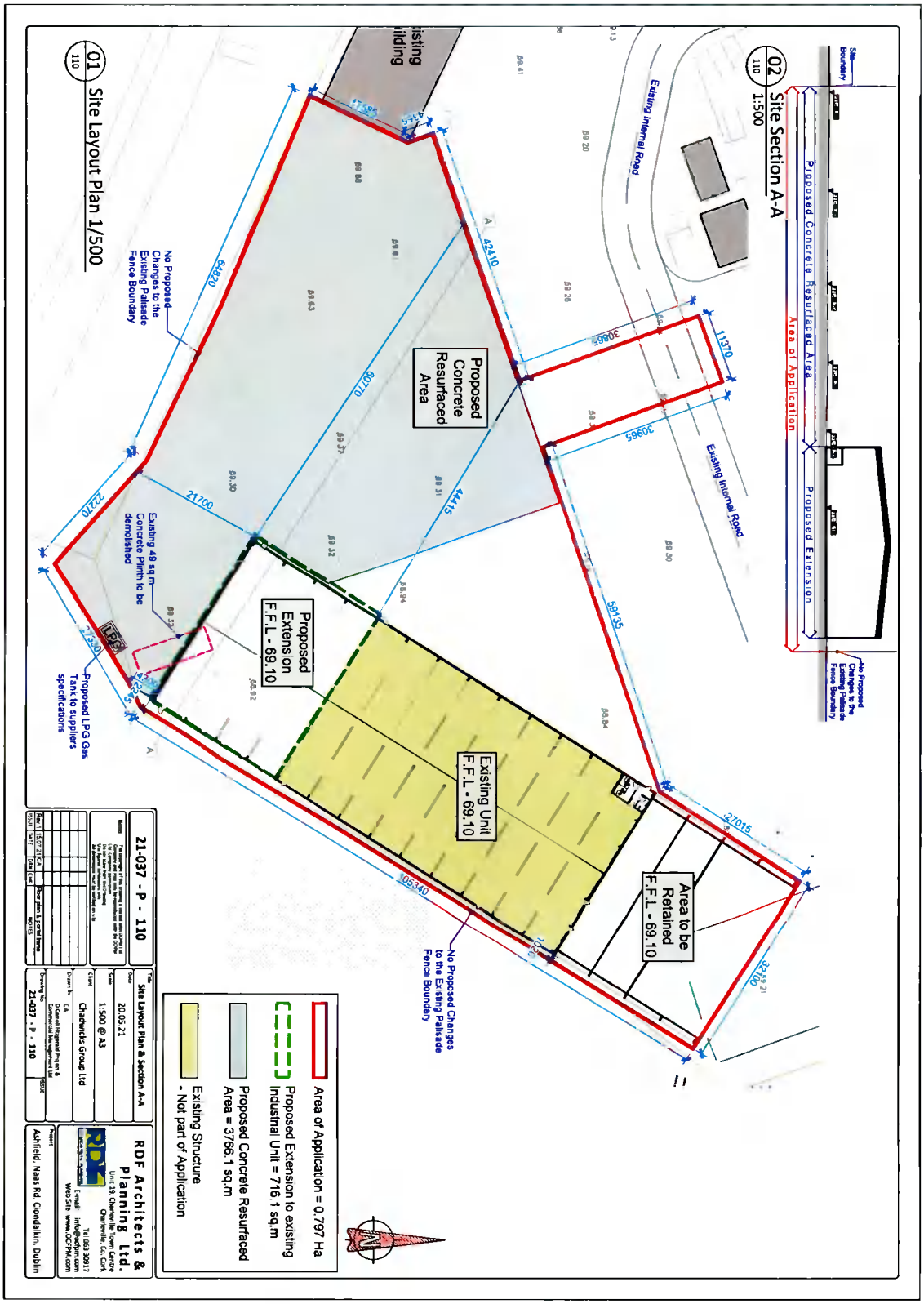
wintering bird populations have been monitored more or less continuously since the late 1960s and the site is now surveyed each winter as part of the larger Dublin Bay complex.

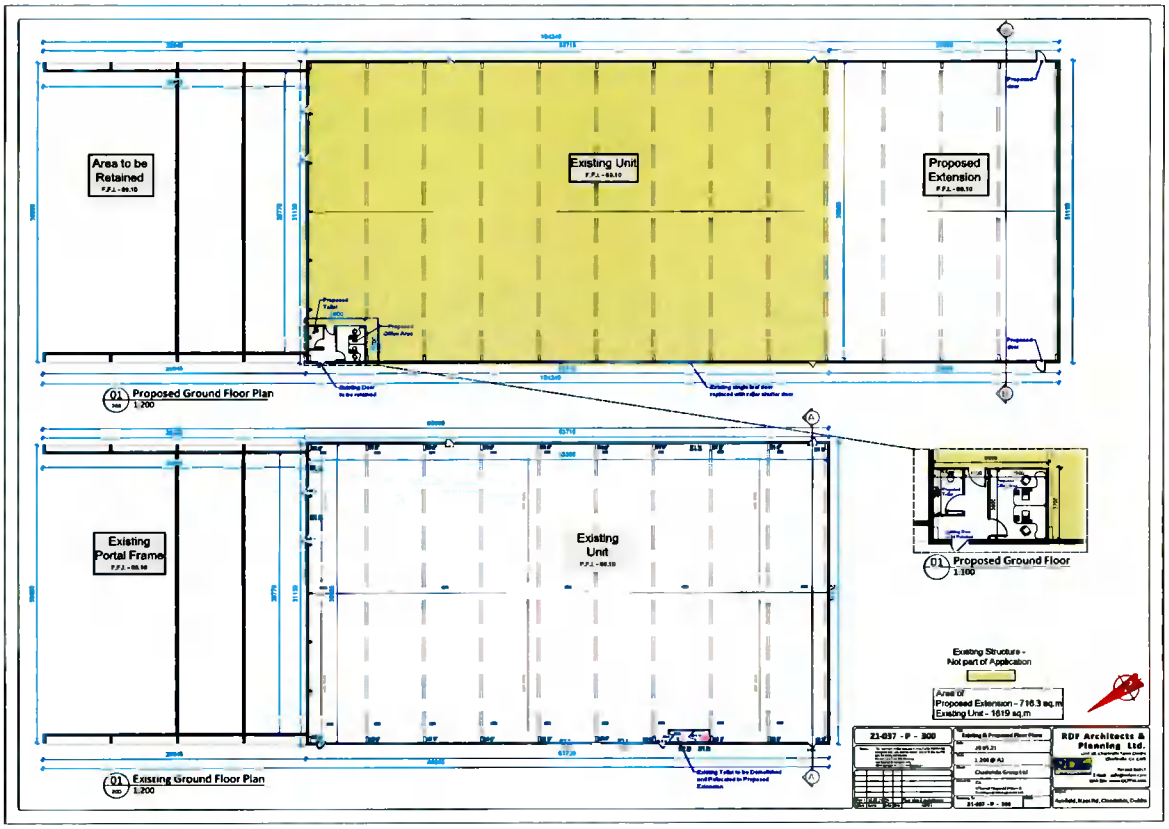
The North Bull Island SPA is a regular site for passage waders, especially Ruff, Curlew Sandpiper and Spotted Redshank. These are mostly observed in single figures in autumn but occasionally in spring or winter.

The site formerly had an important colony of Little Tern but breeding has not occurred in recent years. Several pairs of Ringed Plover breed, along with Shelduck in some years. Breeding passerines include Skylark, Meadow Pipit, Stonechat and Reed Bunting. The island is a regular wintering site for Short-eared Owl, with up to 5 present in some winters.

The North Bull Island SPA is an excellent example of an estuarine complex and is one of the top sites in Ireland for wintering waterfowl. It is of international importance on account of both the total number of waterfowl and the individual populations of Light-bellied Brent Goose, Black-tailed Godwit and Bar-tailed Godwit that use it. Also of significance is the regular presence of several species that are listed on Annex I of the E.U. Birds Directive, notably Golden Plover and Bar-tailed Godwit, but also Ruff and Short-eared Owl. North Bull Island is a Ramsar Convention site, and part of the North Bull Island SPA is a Statutory Nature Reserve and a Wildfowl Sanctuary.

Appendix 2. Site drawings




Area to be Retained
Existing Unit
Proposed Extension
01 Proposed Ground Floor Plan 1:200
Existing Portal Frame
Existing Unit
01 Existing Ground Floor Plan 1:200
01 Proposed Ground Floor 1:100
Existing Structure - Not part of Application
Area Of Proposed Extension - 716.3 sq.m Existing Unit - 1619 sq.m
RDP Architects & Planning Ltd.

Appendix 3. Foul water calculations

DRA	DRA Consulting Engineers The Park Lord Edward Street Limerick	File: 21194-Flow desing.pfd Network: FOUL Sandra Torrico Real 24/06/2021	Page 1

Design Settings

Frequency of use (kDU)	0.60	Minimum Velocity (m/s)	0.75
Flow per dwelling per day (l/day)	4000	Connection Type	Level Inverts
Domestic Flow (l/s/ha)	0.0	Minimum Backdrop Height (m)	0.200
Industrial Flow (l/s/ha)	0.0	Preferred Cover Depth (m)	0.400
Additional Flow (%)	0	Include Intermediate Ground	✓

Nodes

Name	Cover Level (m)	Manhole Type	Easting (m)	Northing (m)	Depth (m)
FOUL AJ 1.0	69.000	Adoptable	694981.117	734898.885	0.500
EX. FOUL	68.900	Adoptable	694999.324	734931.788	1.030

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)
1.000	FOUL AJ 1.0	EX. FOUL	37.605	1.500	68.500	67.870	0.630	59.7	100

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)
1.000	0.862	6.8	0.0	0.400	0.930

Appendix 4. Surface water calculations

DRA Consulting Engineers The Park Lord Edward Street Limerick	File: 21194-Flow desing.pfd Network: Storm Network Sandra Torrico Real 30/06/2021	Page 1

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	5	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	0.75
FSR Region	Scotland and Ireland	Connection Type	Level Inverts
M5-60 (mm)	14.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.300	Preferred Cover Depth (m)	1.200
CV	0.750	Include Intermediate Ground	x
Time of Entry (mins)	5.00	Enforce best practice design rules	x

Nodes

Name	Cover Level (m)	Manhole Type	Easting (m)	Northing (m)	Depth (m)
SWMH 1.0	69.050	Adoptable	695007.969	734880.204	1.030
SWMH 2.0	69.170	Adoptable	694979.617	734897.598	1.370
SWMH 3.0	69.140	Adoptable	694971.990	734916.824	1.480
SWMH FCD 5.0	69.430	Adoptable	694961.923	734944.898	1.980
SWMH 3.1	69.600	Adoptable	694947.794	734908.082	1.430
EX.MH 1.0	69.210	Adoptable	694956.809	734968.431	1.940
SWMH 4.0	69.340	Adoptable	694966.186	734933.010	1.800

Links

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)
1.000	SWMH 1.0	SWMH 2.0	33.262	0.600	68.020	67.800	0.220	151.2	225
1.001	SWMH 2.0	SWMH 3.0	20.684	0.600	67.800	67.660	0.140	147.7	225
1.002	SWMH 3.0	SWMH 4.0	17.195	0.600	67.660	67.540	0.120	143.3	300
1.003	SWMH 4.0	SWMH FCD 5.0	12.629	0.600	67.540	67.450	0.090	140.3	450
1.004	SWMH FCD 5.0	EX.MH 1.0	24.082	0.600	67.450	67.270	0.180	133.8	225
2.000	SWMH 3.1	SWMH 3.0	25.727	0.600	68.170	67.660	0.510	50.4	225

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)
1.000	1.061	42.2	5.0	0.805	1.145
1.001	1.073	42.7	20.1	1.145	1.255
1.002	1.311	92.7	53.9	1.180	1.500
1.003	1.714	272.6	53.9	1.350	1.530
1.004	1.128	44.9	58.4	1.755	1.715
2.000	1.846	73.4	18.6	1.205	1.255

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	Scotland and Ireland	Skip Steady State	x
M5-60 (mm)	14.000	Drain Down Time (mins)	240
Ratio-R	0.300	Additional Storage (m³/ha)	20.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
5	0	0	0
30	0	0	0
100	20	0	0

Node SWMH FCD 5.0 Online Hydro-Brake® Control

Flap Valve	x	Objective	(HE) Minimise upstream storage
Replaces Downstream Link	✓	Sump Available	✓
Invert Level (m)	67.450	Product Number	CTL-SHE-0093-5000-1900-5000
Design Depth (m)	1.900	Min Outlet Diameter (m)	0.150
Design Flow (l/s)	5.0	Min Node Diameter (mm)	1200

Node SWMH 4.0 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	67.540	Depth (m)	1.000
Side Inf Coefficient (m/hr)	0.00000	Time to half empty (mins)		Inf Depth (m)	
Safety Factor	2.0	Pit Width (m)	15.000	Number Required	1
Porosity	0.75	Pit Length (m)	10.500		

Results for 5 year Critical Storm Duration. Lowest mass balance: 99.60%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	SWMH 1.0	10	68.074	0.054	5.6	0.1001	0.0000	OK
15 minute winter	SWMH 2.0	11	67.912	0.112	22.1	0.3073	0.0000	OK
120 minute winter	SWMH 3.0	104	67.864	0.204	21.2	0.5422	0.0000	OK
120 minute winter	SWMH FCD 5.0	98	67.870	0.420	12.7	0.7701	0.0000	SURCHARGED
15 minute winter	SWMH 3.1	10	68.251	0.081	20.6	0.2458	0.0000	OK
15 minute summer	EX.MH 1.0	1	67.270	0.000	4.2	0.0000	0.0000	OK
120 minute winter	SWMH 4.0	102	67.864	0.324	24.1	38.7274	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute winter	SWMH 1.0	1.000	SWMH 2.0	5.4	0.408	0.128	0.4485	
15 minute winter	SWMH 2.0	1.001	SWMH 3.0	21.5	0.786	0.503	0.5641	
120 minute winter	SWMH 3.0	1.002	SWMH 4.0	21.2	1.068	0.229	1.0440	
120 minute winter	SWMH FCD 5.0	Hydro-Brake®	EX.MH 1.0	4.3				66.2
15 minute winter	SWMH 3.1	2.000	SWMH 3.0	20.4	0.836	0.277	0.6133	
120 minute winter	SWMH 4.0	1.003	SWMH FCD 5.0	11.0	0.308	0.040	1.7417	

Results for 30 year Critical Storm Duration. Lowest mass balance: 99.60%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
180 minute winter	SWMH 1.0	172	68.093	0.073	2.2	0.1351	0.0000	OK
180 minute winter	SWMH 2.0	172	68.093	0.293	8.8	0.8062	0.0000	SURCHARGED
180 minute winter	SWMH 3.0	172	68.093	0.433	23.6	1.1507	0.0000	SURCHARGED
180 minute winter	SWMH FCD 5.0	172	68.093	0.643	12.8	1.1793	0.0000	SURCHARGED
15 minute winter	SWMH 3.1	10	68.269	0.099	29.9	0.3019	0.0000	OK
15 minute summer	EX.MH 1.0	1	67.270	0.000	4.3	0.0000	0.0000	OK
180 minute winter	SWMH 4.0	172	68.093	0.553	25.4	66.0788	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
180 minute winter	SWMH 1.0	1.000	SWMH 2.0	2.2	0.320	0.052	0.8470	
180 minute winter	SWMH 2.0	1.001	SWMH 3.0	8.8	0.613	0.206	0.8226	
180 minute winter	SWMH 3.0	1.002	SWMH 4.0	22.1	1.050	0.238	1.2109	
180 minute winter	SWMH FCD 5.0	Hydro-Brake®	EX.MH 1.0	4.3				97.3
15 minute winter	SWMH 3.1	2.000	SWMH 3.0	29.7	0.954	0.405	0.7281	
180 minute winter	SWMH 4.0	1.003	SWMH FCD 5.0	10.9	0.340	0.040	2.0010	

Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 39.60%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
240 minute winter	SWMH 1.0	232	68.784	0.764	2.8	1.4134	0.0000	FLOOD RISK
240 minute winter	SWMH 2.0	232	68.784	0.984	11.1	2.7080	0.0000	SURCHARGED
240 minute winter	SWMH 3.0	232	68.784	1.124	28.6	2.9881	0.0000	SURCHARGED
240 minute winter	SWMH FCD 5.0	232	68.784	1.334	12.7	2.4482	0.0000	SURCHARGED
240 minute winter	SWMH 3.1	232	68.784	0.614	10.3	1.8720	0.0000	SURCHARGED
15 minute summer	EX.MH 1.0	1	67.270	0.000	4.3	0.0000	0.0000	OK
240 minute winter	SWMH 4.0	232	68.783	1.243	27.6	119.9634	0.0000	SURCHARGED

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
240 minute winter	SWMH 1.0	1.000	SWMH 2.0	2.8	0.319	0.066	1.3229	
240 minute winter	SWMH 2.0	1.001	SWMH 3.0	10.0	0.583	0.234	0.8226	
240 minute winter	SWMH 3.0	1.002	SWMH 4.0	27.6	1.070	0.298	1.2109	
240 minute winter	SWMH FCD 5.0	Hydro-Brake®	EX.MH 1.0	4.3				103.6
240 minute winter	SWMH 3.1	2.000	SWMH 3.0	10.3	0.637	0.140	1.0232	
240 minute winter	SWMH 4.0	1.003	SWMH FCD 5.0	11.3	0.342	0.042	2.0010	