

Portmarnock Phase 1B

Natura Impact Statement

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Environmental Assessment **Built Environment**

Client:

St. Marnock's DAC II & Clear Real
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1 Introduction

1.1 Background

St Marnock's DAC11 and Clear Real Estate Investments Plc are applying to An Bord Pleanála for planning permission for the development of a residential scheme at Portmarnock South (known as Portmarnock Phase 1B). The proposed development, which is located within the area covered by the Portmarnock South Local Area Plan, comprises the construction of 150 residential units and related infrastructure, landscaping and a detention pond, as well as the delivery of a regional wetland with a storm water outfall to Baldoyle Bay.

This Natura Impact Statement is intended to provide the information required to assist An Bord Pleanála, the competent authority, to undertake a Screening Assessment and, if necessary, an Appropriate Assessment (AA). This will determine the effects, if any, on European sites, (also known as Natura 2000 Sites) (Special Areas of Conservation (SAC) and Special Protection Areas (SPA), designated for nature conservation). The potential impacts on European sites, both as a result of the proposed development and in-combination with other plans and projects, are appraised in this report.

Brady Shipman Martin was commissioned to undertake the study, which was carried out by Consultant Ecologist Matthew Hague CEnv MCIEEM, with additional survey work undertaken by ecologists John Brophy MCIEEM and Fionnuala O'Neil (BEC Consultants Ltd) and by coastal processes and flooding engineer Adrian Bell (RPS Ltd).

The requirements for an Appropriate Assessment are set out under *Article 6 of the EU Habitats Directive (92/34/EEC)*, transposed into Irish law through the *European Communities (Birds and Natural Habitats) Regulations 2011* (SI No. 477 of 2011, known as the *Habitats Regulations*) and the *Planning and Development Act, 2000* (as amended).

2 Methodology

2.1 Baseline data collection and field visits

A desk-based assessment was undertaken of the site at Portmarnock and the wider area. This focused on habitats and species that are listed as Qualifying Interests (QI) (in the case of SACs) and Special Conservation Interests (SCI) (in the case of SPAs) in the designations for the European sites as well as on the published Conservation Objectives for each European site. A number of field visits have also been undertaken over several years, most recently by the author on 27th October 2017.

Informal site consultations have also been undertaken, with the Fingal County Council Biodiversity Officer and with the District Conservation Officer and local Wildlife Ranger of the National Parks and Wildlife Service (NPWS). A formal consultation request in relation to matters concerning nature conservation was sent to the Development Applications Unit (DAU) of the Department of Culture, Heritage and the Gaeltacht on 21st September 2017 and a response was received on 11th December 2017.

This report takes the following guidance documents into account:

- *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 NPWS 1/10 & PSSP 2/10;
- *Assessment of Plans and Projects Significantly Affecting European sites: Methodological Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC* (European Commission Environment Directorate-General, 2001);

- *Managing Natura 2000 sites: The Provisions of Article 6 of the Habitats Directive 92/43/EEC*. Draft Guidance issued by the European Commission (April 2015).

Information was collated from the organisations and websites listed below:

- Data on European sites and rare and protected plant and animal species contained in the following databases:
 - The National Parks and Wildlife Service (NPWS) of the Department of Arts, Heritage and the Gaeltacht (www.NPWS.ie);
 - The National Biodiversity Data Centre (NDBC) (www.biodiversityireland.ie);
 - BirdWatch Ireland (www.birdwatchireland.ie);
 - Bat Conservation Ireland (www.batconservationireland.org).
- Information on land-use zoning from the online mapping of the Department of the Environment, Community and Local Government (<http://www.myplan.ie/en/index.html>);
- Recent and historical OSi mapping and aerial photography;
- Information on the Rivers Boyne and Nanny, and other local watercourses from www.catchments.ie;
- Information on water quality in the area (www.epa.ie);
- Information on soils, geology and hydrogeology in the area (www.gsi.ie);
- Information on the status of EU protected habitats in Ireland (NPWS, 2013);
- Third National Biodiversity Action Plan 2017 – 2021 (Department of Culture, Heritage, and the Gaeltacht, 2017);
- Fingal County Development Plan 2017 – 2023 and the accompanying Natura Impact Report;
- Portmarnock South Local Area Plan 2013 and the accompanying Natura Impact Report.

The report has regard to the following legislative instruments:

- Planning and Development, Act 2000, as amended;
- European Commission (EC) Habitats Directive 92/43/EEC;
- European Commission (EC) Birds Directive 2009/147/EC;
- European Communities (Birds and Natural Habitats) Regulations 2011 (SI no 477 of 2011).

Where relevant, information contained in the following documents has been reviewed:

- Proposed Phase 1A Residential Development at Station Road, Portmarnock, Co. Dublin: Natura Impact Statement and Biodiversity Report (Golder Associates, 2014);
- Conservation Management Plan for Portmarnock Phase 1A Residential Development (Brady Shipman Martin, 2014);
- Portmarnock Foul Water Pumping Station (Draft AA Screening Report prepared by Mott MacDonald Ltd on behalf of Irish Water, 2017);
- Baldoyle to Portmarnock Coastal Path and Cycleway (Draft NIS prepared by WS Atkins Ireland Ltd on behalf of Fingal County Council, 2017);
- Winter Bird Study of Lands around Baldoyle Bay 2016-2017: report prepared for Fingal County Council (Natura Environmental Consultants, August 2017);
- Baldoyle Estuary Storm Water Outfall Estuary Bed Erosion Study (RPS Ltd, for JB Barry and Partners Ltd., 2017 (Appendix 2));
- Portmarnock Storm Outfall: Marine and Coastal Habitats (Report prepared by BEC Ltd, for JB Barry and Partners Ltd., 2017 (Appendix 3));
- Water Quality Report (prepared for this Natura Impact Statement by JB Barry and Partners Ltd. (Appendix 4));
- Construction Management Plan (Linesight Ltd (Appendix 5));

- Conservation Objectives documents for relevant European sites (NPWS), extracts of which are included as Appendix 6.

2.2 Potential Zone of Influence

In ecological and environmental impact assessment, for the risk of an impact to occur there must be a 'source', such as a construction site; a 'receptor', such as a designated site for nature conservation; and a pathway between the source and the receptor, such as a watercourse that links the construction site to the designated site. Although there may be a risk of an impact it may not necessarily occur, and if it does occur, it may not be significant.

Identification of a risk means that there is a possibility of ecological or environmental damage occurring, with the level and significance of the impact depending upon the nature and exposure to the risk and the characteristics of the receptor.

In accordance with the National Roads Authority *Guidelines for Assessment of Ecological Impacts of National Road Schemes* (NRA/TII, 2009 (Rev. 2)), the Zone of Influence of a project may be defined as the ecological areas and features (*i.e.* the ecological resources/receptors) likely to be affected by the biophysical changes caused by the project, however remote from [the project]. From this it will be possible to establish a 'zone of influence' for the project that encompasses all of its potential impacts. There are no set recommended distances for projects to consider European sites as being relevant for assessment. Rather, NPWS (2010) recommends that '*the distance should be evaluated on a case-by-case basis with reference to the nature, size and location of the project, and the sensitivities of the ecological receptors, and the potential for in combination effects*'. As a rule of thumb, it is often considered appropriate to include all European sites within 15km.

In some instances where there are hydrological connections a whole river catchment or a groundwater aquifer may need to be included. Similarly, where bird flight paths are involved the impact may be on an SPA more than 15 km away. Taking this into account, as a starting point a search was carried out for all European sites within 15km of the study area at Portmarnock. This search was then extended to ensure that all European sites with any potential links to the proposed development were accounted for in the study.

3 The Study area and the proposed development

3.1 Study area and surrounding environment

The study area comprises the site, located at Station Road, Portmarnock, close to Baldoyle Bay, defined by the site boundary for the proposed development (see Figure 1), as well as an appropriate distance outside the site (the Zone of Influence as defined in Section 2.2).

The proposed Phase 1B development site is located immediately to the east of Phase 1A, a residential development of 101 units, currently nearing completion, and permitted under planning permission granted by Fingal County Council (Reg. Ref.: F13A/O248). The Phase 1B site comprises the northern and eastern part of a large field, which was formerly in agricultural use as arable land. The western part of the field is occupied by the Portmarnock Phase 1A development. Two temporary surface water attenuation ponds, designed to serve Phase 1A, are present on the site itself. The northern boundary of the site (onto Station Road) comprises a part open section and a part mature deciduous tree lined hedgerow. The eastern boundary comprises an ash and hawthorn dominated tree line/hedgerow with an associated damp ditch. This feature defines the townland boundary between Portmarnock to the west and Maynetown to the east. The southern boundary is open to the remainder of the field.

In addition to the main site, which is located west of the townland boundary hedgerow, the area proposed for development also includes part of the field to the east of the feature, adjacent to the R106 Coast Road, where it is proposed to develop a regional wetland. The proposed development site also includes an area, to the immediate east of the R106 Coast Road, which is within the boundary of a European designated site (Baldoyle Bay SAC and SPA), and where it is proposed to install an outfall from the regional wetland to Baldoyle Estuary.

The proposed development is in accordance with the provisions of the detailed Local Area Plan (LAP) prepared for the overall Portmarnock South lands (Fingal County Council, 2103).

As part of the Phase 1A development, and again in accordance with the provisions of the LAP, significant mitigation measures were put in place, both within the Phase 1A lands itself, and within the wider lands covered by Portmarnock South LAP. These included the following, which were designed to mitigate any potential impacts on the Special Conservation Interests and Qualifying Interests of Baldoyle Bay SPA and SAC resulting from residential development to be delivered as part of Portmarnock South Local Area Plan:

- Provision of a large area of Ecological buffer/parkland, located between residential zoned lands within the LAP to the west and the boundary with Coast Road to the east and with Mayne Road to the south;
- Provision of a 'Quiet Zone' for birds, in the southern part of the Portmarnock South Local Area Plan lands;
- Provision of an arable plot and retention of an existing small attenuation pond located between the above 'Bird Quiet Zone' and Mayne Road.
- Clearing of bramble scrub and reseeded of areas to grassland within the Murragh Spit east of the R106 Coast Road (within Baldoyle Bay SAC and SPA), undertaken in 2016 and 2017. This was undertaken, in agreement with Fingal County Council and NPWS (letter granting permission to carry out an operation or activity on a site to which the European Communities (Birds and Natural Habitats) Regulations 2011 apply), to provide additional areas of foraging habitat for bird species, in particular overwintering light-bellied Brent geese;
- Treatment of invasive species listed on Schedule 3 of the *Birds and Habitats Regulations, 2011* specifically a small area of Japanese knotweed (*Fallopia japonica*) on the Murragh Spit and giant hogweed (*Heracleum mantegazzianum*) located within the Phase 1A lands. The stand of Japanese knotweed is being effectively managed in conjunction with Fingal County Council. A giant hogweed management plan has been in force for the Phase 1A lands over the past 4 years and no giant hogweed growth was observed during 2017. Nevertheless the site will continue to be managed during future construction phases to ensure full control of giant hogweed;

These measures have been implemented and are subject to ongoing management, including mowing of the reseeded grass areas within the Murragh so as to ensure that the sward length is suitable for foraging light-bellied Brent geese.

In compliance with planning conditions for the Phase 1A development, an agreement is in place between the landowner and Fingal County Council to hand over the above lands covered by the ecological buffer lands. It is expected that this transfer will be completed in the near future and this will enable Fingal County Council to take full charge of the long-term management of the ecological buffer area and bird quiet zone.

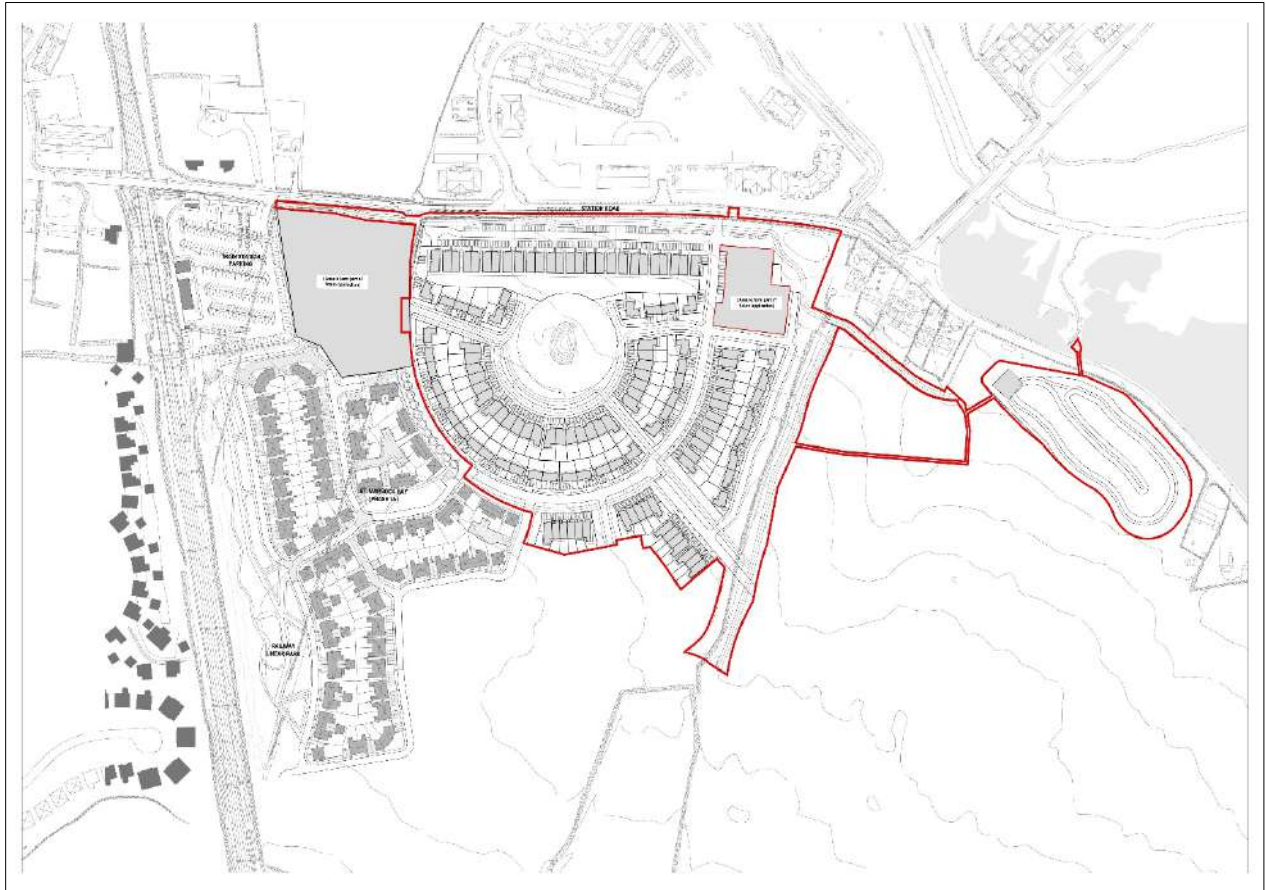


Figure 1 Portmarnock Phase 1B Application Site

3.2 European sites in the vicinity of the proposed development

A number of European sites are located within 15km of the proposed development site at Portmarnock. These European sites are listed in Table 1 and are shown in Figure 2. Figure 3 shows the European sites in close proximity to the site.

Table 1 European sites within 15km

European site (site code)	Location (closest straight line distance from the development site at Portmarnock)
Special Areas of Conservation (SAC)	
Baldoyle Bay (000199)	The proposed surface water outlet from the regional wetland will be situated within the edge of the SAC
Malahide Estuary (000205)	2.3km to the north
North Dublin Bay (000206)	3.4km to the south
Rockabill to Dalkey Island(003000)	4.7km to the east
Ireland's Eye (002193)	4.9km to the east
Howth Head (000202)	5.5km to the south east
South Dublin Bay (000210)	8.8km to the south
Rogerstown Estuary (000208)	8.8km to the north
Lambay Island (000204)	10.7km to the north east
Special Protection Areas (SPA)	

European site (site code)	Location (closest straight line distance from the development site at Portmarnock)
Baldoyle Bay (004016)	The proposed surface water outfall from the regional wetland will be situated within the edge of the SPA.
Broadmeadow/Swords Estuary (Malahide Estuary) (004025)	2.9km to the north
North Bull Island (004006)	3.4km to the south
Ireland's Eye (004117)	4.6km to the east
Howth Head (004113)	6.5km to the south east
South Dublin Bay and River Tolka Estuary (004024)	7.1km to the south
Rogerstown Estuary (004015)	8.6km to the north
Lambay Island (004069)	10.6km to the north east
Dalkey Islands (004172)	15.7km to the south

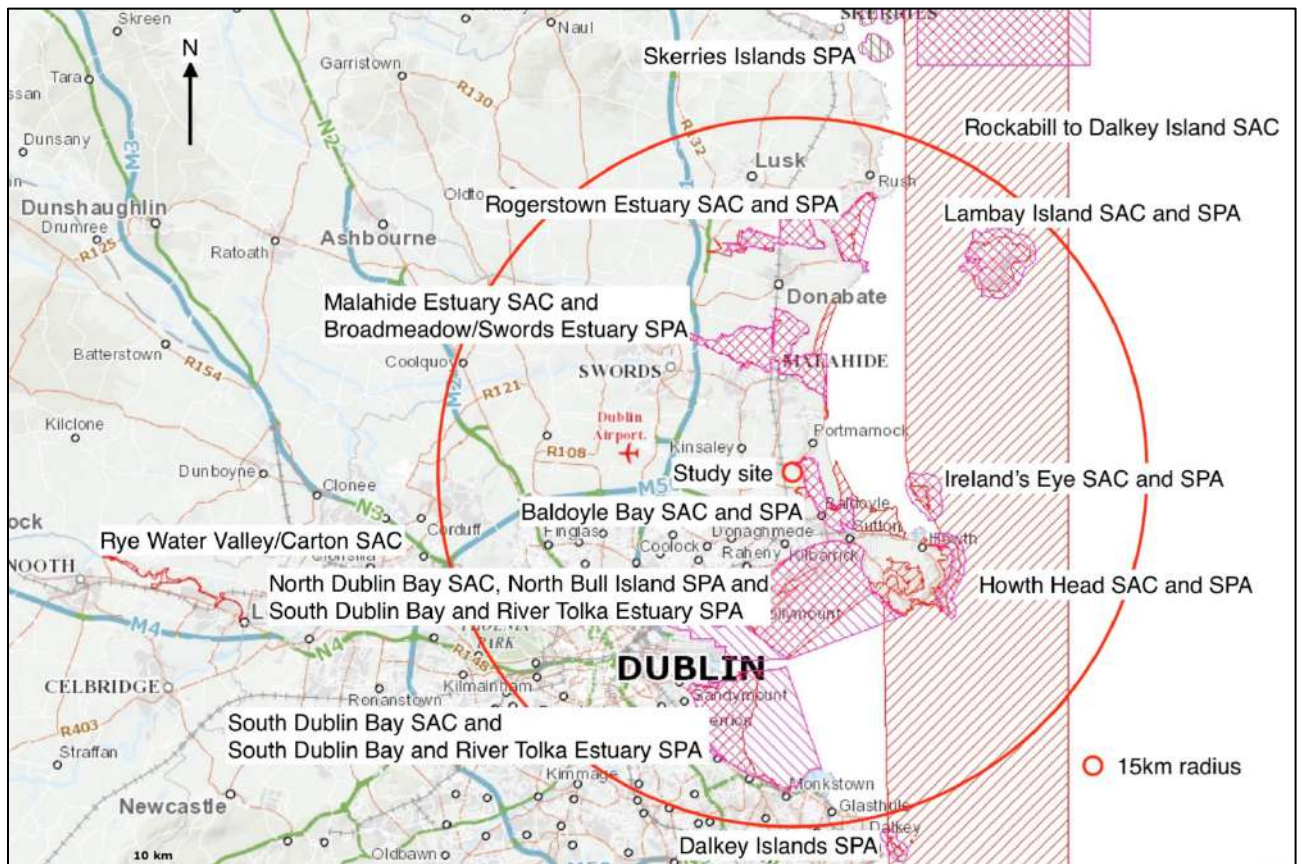


Figure 2 European sites in relation to the study area/application site

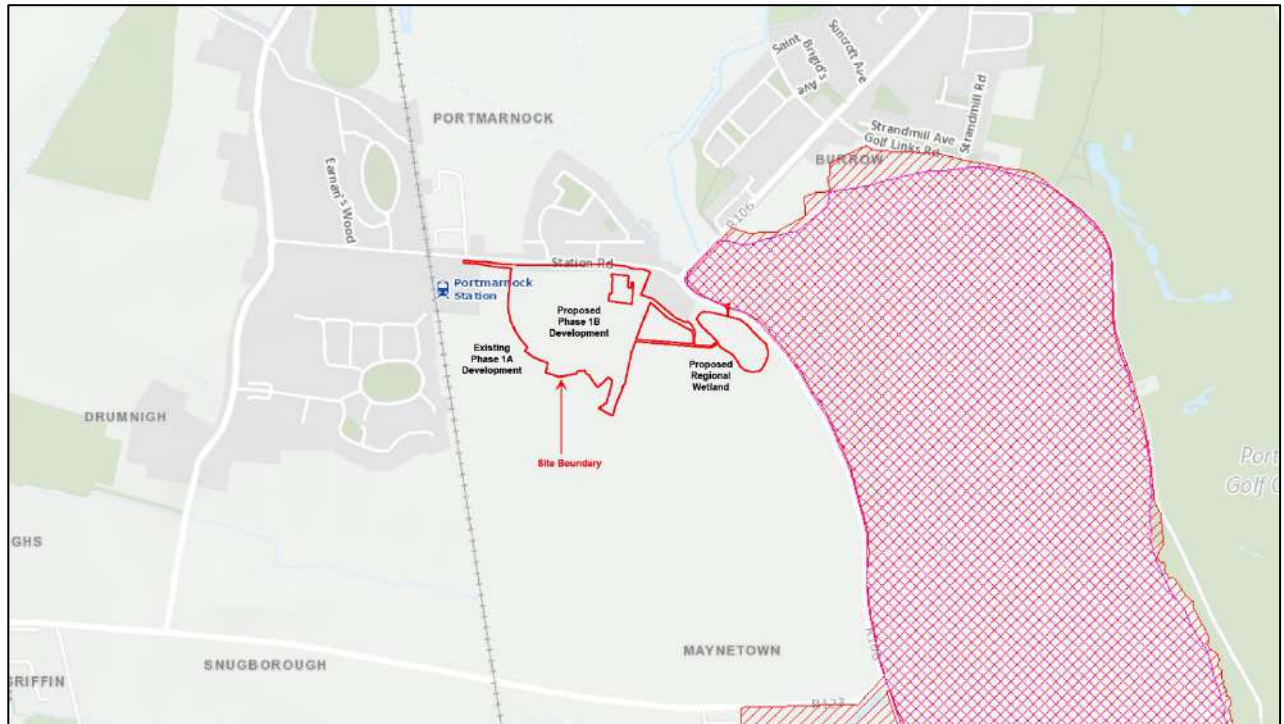


Figure 3 European sites in the vicinity of the proposed development area

3.3 Description of the proposed development

Each element of the development under appraisal is required to conform to the Objectives and Policies of the *Portmarnock South Local Area Plan (2013)* and *Fingal Development Plan (2017-2023)*. In particular, Portmarnock South LAP has at its core a requirement to provide new, high quality urban residential development while protecting and enhancing the existing biodiversity features of the area, as well as maintaining the integrity of the European sites of Baldoyle Bay. Significant elements of these objectives have already been implemented, as part of Portmarnock Phase 1A (including habitat protection measures in the ecological buffer zone).

The Phase 1B development, which is the subject of the current application, will continue to implement the LAP Green Infrastructure and Conservation objectives, through the development of natural habitat and biodiversity-supporting spaces. In addition, the Phase 1B application includes the delivery of new surface water management infrastructure, incorporating Sustainable urban Drainage Systems (SuDS). This infrastructure includes a SuDS designed wetland to be located within the eastern section of the ecological buffer zone, as well as filter strips, swales, green roofs, porous paving and bio-retention areas.

The new SuDS wetland will be a regional wetland, of over 0.9 hectares in area, designed to serve the majority of the LAP area (which provides for up to 1200 residential units). This is in compliance with LAP Objective GI 43 (*Ensure the early completion of the proposed regional SuDS wetland* – refer to Figure 4). It is designed for the benefit of biodiversity and will incorporate native aquatic and marginal aquatic species, incorporating a permanent area of water, with a maximum depth of c.600mm. The regional wetland requires an outfall to Baldoyle Estuary, which will be located adjacent to east side of Coast Road.

The development will consist of 150 residential units, associated roads, footpaths, private driveways, landscaping, site services, SuDS measures including a regional wetland, a surface outfall to Baldoyle Estuary and associated works.



Figure 4 Extract from Portmarnock South Local Area Plan with the proposed development area, including the regional wetland, which is located where the SuDS feature is proposed in the LAP

3.3.1 Key ecological receptors

The NPWS database was consulted with regard to rare species (Curtis & McGough, 1988) and species protected under the *Flora Protection Order* (2015). There are records of a number of protected species within the 10km grid square that covers the proposed development area, including basil thyme (*Acinos arvensis*), lesser centaury (*Centaureum pulchellum*), red hemp nettle (*Galeopsis angustifolia*), meadow barley (*Hordeum secalinum*), oyster plant (*Mertensia maritima*), round prickly-headed poppy (*Papaver hybridum*), tufted saltmarsh grass (*Puccinellia fasciculata*), meadow saxifrage (*Saxifraga granulata*), annual knawel (*Scleranthus annuus*), and hairy violet (*Viola*

hirta). None of these plants are known to occur within the site itself and none were recorded during any of the field surveys undertaken.

No rare habitats or habitats of particularly high ecological value are present on the site proposed for the development. No rare plants were recorded during the site visits. No evidence of badgers was recorded on the site. The hedgerows and tree lines are of local ecological value for nesting birds. No evidence of reptiles or amphibians (breeding or otherwise) was noted during the site surveys.

The site contains very few potentially significant features (trees and buildings) that may be of use for roosting bats. The bat surveys undertaken to date have confirmed that overall, bat activity was very low given that at the time of year the survey was undertaken (November 2013 & September 2016), it is not uncommon for male bats to fly up and down hedgerow hundreds of times in a night, emitting social calls to attract females. Bat activity along the roads surrounding the site was low during the pre-dawn driven transect. This level of activity was also noted in two other nights of survey in this area. Bat activity to the south of the site was concentrated along the R132 Moyne Road linking Balgriffin and the Coast Road. There are no known roosts within the site and there was no evidence of a roost during the survey.

Overall the site (with the exception of the area around the outfall from the proposed regional wetland, which is to be located within the boundary of Baldoyle Bay SAC and SPA) is of **Local Importance (Lower Value)**, in accordance with the ecological resource valuations presented in the National Roads Authority Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009 (Rev. 2)).

The proposed development will necessitate the permanent change of use of part of a former arable field to the west of the north-south hedgerow/tree line (the area now occupied by the construction site related to Portmarnock Phase 1A, including two temporary attenuation ponds). The proposed regional wetland will be developed in the northern part of the lands seeded under Phase 1A works, as ecological buffer area (former arable field) located to the east of Phase 1B and adjacent to Coast Road. The regional wetland is to be provided at the location as indicated in the Portmarnock South LAP.

A short section of approx. 100m of the remaining tree-line/hedgerow that forms the northern perimeter of the site, along Station Road, will be removed. The tree line/hedgerow and associated damp ditch (townland boundary) that runs north-south along the eastern side of the proposed Phase 1B residential development will be substantially retained. A short section of hedgerow removal of c.50m, to allow for development of part of the 'inter-monumental route' proposed between the 2 recorded monuments on the lands, coincides with an existing c.20m break in the hedgerow (formed as part of Phase 1A works) thereby limiting additional removal to c.30m. Otherwise this tree-line/hedgerow is to be retained and managed as an ecological feature within a proposed linear park located along the townland boundary.

Care must be taken during any development to ensure that species protected under the *Wildlife Act* are not harmed. However with appropriate mitigation it is not expected that any significant impacts will arise on ecological receptors such as nesting birds or commuting or foraging bats as a result of these elements of the proposed development. Full details are included in the Biodiversity report for the proposed development, included within the overall planning application documentation.

3.4 Screening for Appropriate Assessment

According to the draft Guidance published by the EC (*Managing Natura 2000 sites: The Provisions of Article 6 of the Habitats Directive 92/43/EEC*, dated April 2015) the "integrity of a site" relates to the site's conservation objectives. For example, it is possible that a plan or project will adversely affect the site only in a visual sense or only affect habitat types or species other than those listed in Annex I or Annex II. In such cases, the effects do not amount to an adverse effect for the purposes of Article 6(3). If none of the habitat types or species for which the site has been designated is significantly affected then the site's integrity cannot be considered to be adversely affected.

Given the location of the proposed development of Portmarnock Phase 1B, as well as its nature and scale, including the construction of the regional wetland (with its proposed outfall, located within the boundary of Baldoyle Bay SAC and SPA) and connections to services including water supply and foul infrastructure, it is possible to rule out potential significant adverse effects arising out of the development on the following European sites.

- Malahide Estuary SAC;
- North Dublin Bay SAC;
- Rockabill to Dalkey Island SAC;
- Ireland’s Eye SAC and SPA;
- Howth Head SAC and SPA;
- South Dublin Bay;
- Rogerstown Estuary and
- Lambay Island SAC and SPA;
- South Dublin Bay and River Tolka Estuary SPA;
- Rogerstown Estuary SPA;
- Dalkey Islands SPA.

These sites are at such a distance from the proposed development site that there would not be any significant effects on them as a result of:

- Habitat loss and/or fragmentation;
- Impacts to habitat structure;
- Disturbance to species of conservation concern;
- Mortality to species (such as roadkill);
- Noise pollution;
- Emissions to air;
- Emissions to water.

No other European sites (either those listed above or further afield) are considered to be relevant to this assessment of the proposed development at Portmarnock Phase 1B. It is considered that these sites can be screened out (Appropriate Assessment Screening) and they are not considered any further in this report.

The European Sites under appraisal in this Natura Impact Statement are therefore as follows:

- Baldoyle Bay SAC;
- Baldoyle Bay SPA;
- North Bull Island SPA;
- Malahide Estuary SPA.

Table 2 Relevant sites and reasons for designation

European site (site code)	Reasons for designation (information correct as of 29 th November 2017)	Source-pathway-receptor
Special Areas of Conservation		
Baldoyle Bay (000199)	<ul style="list-style-type: none"> ■ Mudflats and sandflats not covered by seawater at low tide [1140] ■ Salicornia and other annuals colonising mud and sand [1310] ■ Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) [1330] ■ Mediterranean salt meadows (<i>Juncetalia maritimae</i>) [1410] <p>According to the SAC’s Natura 2000 information the site comprises a relatively small estuarine and bay system in</p>	There is a potential link between the proposed development of Portmarnock Phase 1B, both during construction and operation (including the regional wetland and associated outfall) and the SAC, specifically the habitat Qualifying Interests for which the site is designated, via disturbance during construction and operation, emissions to water and, potentially, habitat loss within the SAC.

European site (site code)	Reasons for designation (information correct as of 29 th November 2017)	Source-pathway-receptor
	<p>north County Dublin. It receives the flows of the Mayne and Sluice rivers, both of which drain an agricultural / suburban catchment. The inner part of the site is sheltered from the sea by a large sand dune peninsula, though most of the dunes are now used as a golf course. Sediments in the inner sheltered areas are mostly muds or muddy sands, often with a high organic content. Part of the tidal section of the Mayne River and adjoining brackish marshes are included in the site. The outer part of the site is exposed to the open sea and the sediments here are predominantly well-aerated sands. In addition to the intertidal and salt marsh habitats, small areas of sand dunes and sandy beaches are included.</p> <p>It is a typical eastern estuarine system with fairly extensive intertidal sand and mud flats. There is good diversity in sediment types. <i>Zostera</i> spp is present. Quality variable but generally good. Salt marshes are well represented and are at least of moderate quality. Two Red Data Book plant species are present. These plants, Borrer's saltmarsh grass (<i>Puccinellia fasciculata</i>) and meadow barley (<i>Hordeum secalinum</i>) are legally protected under the <i>Flora Protection Order, 2015</i> It is of importance for wintering waterfowl, with an internationally important population of light-bellied Brent geese (<i>Branta bernicla horta</i>) and nationally important populations of a further 6 species including golden plover (<i>Pluvialis apricaria</i>) and bar-tailed godwit (<i>Limosa lapponica</i>). Little tern (<i>Sterna albifrons</i>) formerly bred.</p>	
Special Protection Areas		
Baldoye Bay (004016)	<ul style="list-style-type: none"> ■ Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046] ■ Shelduck (<i>Tadorna tadorna</i>) [A048] ■ Ringed Plover (<i>Charadrius hiaticula</i>) [A137] ■ Golden Plover (<i>Pluvialis apricaria</i>) [A140] ■ Grey Plover (<i>Pluvialis squatarola</i>) [A141] ■ Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157] ■ Wetland and Waterbirds [A999] <p>According to the SPA's Natura 2000 information the SPA comprises a relatively small estuarine system in north County Dublin (it overlaps with Baldoye Bay SAC). It receives the flows of the Mayne and Sluice rivers, both of which drain an agricultural / suburban catchment. Much of the estuary is sheltered from the sea by a large sand dune peninsula (now mostly a golf course). Sediments in the inner sheltered areas are mostly muds or muddy sands, often with a high organic content. Towards Portmarnock Point, the sediments are predominantly well-aerated sands. In addition to the intertidal flats and salt marsh habitats, a small area of sand hills and sandy beach at Portmarnock Point is included in the site.</p>	There is a potential link between the proposed development of Portmarnock Phase 1B, both during construction and operation (including the regional wetland and associated outfall) and the SPA, specifically the birds and wetland habitat Special Conservation Interests for which the site is designated, via disturbance, emissions to water and, potentially, habitat loss within the SPA.

European site (site code)	Reasons for designation (information correct as of 29 th November 2017)	Source-pathway-receptor
	<p>Baldoyle Bay is a typical eastern estuarine system with fairly extensive intertidal sand and mud flats which have <i>Zostera</i> spp. It also has good salt marsh fringes where birds roost. The quality of habitats present is variable but generally good. The site supports a good diversity of wintering waterfowl and notably an internationally important population of light-bellied Brent geese (<i>Branta bernicla hrota</i>). It has nationally important populations of shelduck (<i>Tadorna tadorna</i>), pintail (<i>Anas acuta</i>), ringed plover <i>Charadrius hiaticula</i>), golden plover (<i>Pluvialis apricaria</i>), grey plover <i>Pluvialis squatarola</i>) and bar-tailed godwit (<i>Limosa lapponica</i>). At high tide the shallow waters regularly attract species such as great crested grebe <i>Podiceps cristatus</i>) and red-breasted merganser (<i>Mergus serrator</i>). Little tern (<i>Sterna albifrons</i>) formerly bred at the site, but not since the early 1990s.</p>	
<p>Malahide Estuary (004025)</p>	<ul style="list-style-type: none"> ■ Great Crested Grebe (<i>Podiceps cristatus</i>) [A005] ■ Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046] ■ Shelduck (<i>Tadorna tadorna</i>) [A048] ■ Pintail (<i>Anas acuta</i>) [A054] ■ Goldeneye (<i>Bucephala clangula</i>) [A067] ■ Red-breasted Merganser (<i>Mergus serrator</i>) [A069] ■ Oystercatcher (<i>Haematopus ostralegus</i>) [A130] ■ Golden Plover (<i>Pluvialis apricaria</i>) [A140] ■ Grey Plover (<i>Pluvialis squatarola</i>) [A141] ■ Knot (<i>Calidris canutus</i>) [A143] ■ Dunlin (<i>Calidris alpina</i>) [A149] ■ Black-tailed Godwit (<i>Limosa limosa</i>) [A156] ■ Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157] ■ Redshank (<i>Tringa totanus</i>) [A162] ■ Wetland and Waterbirds [A999] <p>According to the SPA's Natura 2000 information the SPA is situated in north Co. Dublin, between the towns of Malahide and Swords. It comprises the estuary of the River Broadmeadow. A railway viaduct, built in the 1800s, crosses the site and has led to the inner estuary becoming lagoonal in character and only partly tidal. Much of the outer part of the estuary is well-sheltered from the sea by a large sand spit, known as "the island". This spit is now mostly converted to golf-course. The outer part empties almost completely at low tide and there are extensive intertidal flats. Salt marshes occur in parts of the outer estuary and in the extreme inner part of the inner estuary.</p> <p>The site is of high importance for wintering waterfowl and supports a particularly good diversity of species. It has an internationally important population of light-bellied Brent geese (<i>Branta bernicla hrota</i>) (4.8% of</p>	<p>There is a potential link between the proposed development of Portmarnock Phase 1B, both during construction and operation (including the regional wetland and associated outfall) and the SPA, specifically the birds and wetland habitat Special Conservation Interests for which the site is designated, via disturbance.</p>

European site (site code)	Reasons for designation (information correct as of 29 th November 2017)	Source-pathway-receptor
	<p>national total), and nationally important populations of a further 12 species. Of particular note are the populations of shelduck (<i>Tadorna tadorna</i>) (3.0% of national total), pintail (<i>Anas acuta</i>) (2.9% of national total), red-breasted merganser (<i>Mergus serrator</i>) (2.8% of national total), grey plover (<i>Pluvialis squatarola</i>) (2.7% of national total) and knot (<i>Calidris canutus</i>) (3.7% of national total). The site is one of the few in eastern Ireland where substantial numbers of goldeneye (<i>Bucephala clangula</i>) occur. It has a regionally important population of black-tailed godwit (<i>Limosa lapponica</i>). The site is an important and regular site for a range of autumn passage migrants, especially dunlin (<i>Calidris ferruginea</i>) and ruff (<i>Philomachus pugnax</i>). It supports a regular flock of non-breeding mute swan (<i>Cygnus olor</i>).</p>	
<p>North Bull Island (004006)</p>	<ul style="list-style-type: none"> ■ Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046] ■ Shelduck (<i>Tadorna tadorna</i>) [A048] ■ Teal (<i>Anas crecca</i>) [A052] ■ Pintail (<i>Anas acuta</i>) [A054] ■ Shoveler (<i>Anas clypeata</i>) [A056] ■ Oystercatcher (<i>Haematopus ostralegus</i>) [A130] ■ Golden Plover (<i>Pluvialis apricaria</i>) [A140] ■ Grey Plover (<i>Pluvialis squatarola</i>) [A141] ■ Knot (<i>Calidris canutus</i>) [A143] ■ Sanderling (<i>Calidris alba</i>) [A144] ■ Dunlin (<i>Calidris alpina</i>) [A149] ■ Black-tailed Godwit (<i>Limosa limosa</i>) [A156] ■ Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157] ■ Curlew (<i>Numenius arquata</i>) [A160] ■ Redshank (<i>Tringa totanus</i>) [A162] ■ Turnstone (<i>Arenaria interpres</i>) [A169] ■ Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179] ■ Wetland and Waterbirds [A999] <p>According to the SPA's Natura 2000 information 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</p>	<p>There is a potential link between the proposed development of Portmarnock Phase 1B, both during construction and operation (including the regional wetland and associated outfall) and the SPA, specifically the birds and wetland habitat Special Conservation Interests for which the site is designated, via disturbance.</p>

European site (site code)	Reasons for designation (information correct as of 29 th November 2017)	Source-pathway-receptor
	<p>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 landuse within the site.</p> <p>The site is among the top ten sites for wintering waterfowl in the country. It supports internationally important populations of light-bellied Brent geese (<i>Branta bernicla hrota</i>) and bar-tailed godwit (<i>Limosa lapponica</i>) 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 shelduck (<i>Tadorna tadorna</i>) (8.5% of national total), pintail (<i>Anas acuta</i>) (11.6% of national total), grey plover (<i>Pluvialis squatarola</i>) (6.9% of national total), knot (<i>Calidris canutus</i>) (10.5% of national total). North Bull Island SPA is a regular site for passage waders such as ruff (<i>Philomachus pugnax</i>), curlew sandpiper (<i>Calidris ferruginea</i>) and spotted redshank (<i>Tringa erythropus</i>). The site supports short-eared owl (<i>Asio flammeus</i>) in winter. Formerly the site had an important colony of little tern (<i>Sterna albifrons</i>) 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 petalwort (<i>Petalophyllum ralfsii</i>) 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 the site.</p>	

3.4.1 Other designated sites (other than European sites)

Baldoyle Bay proposed Natural Heritage Area (pNHA), site code 000199, is contiguous with the European designations under appraisal in this report. The only other pNHA within the potential zone of influence of the proposed development, Sluice River Marsh (001763), is located approximately 200m to the north of the proposed development site. As confirmed in the accompanying biodiversity report, no impacts are expected on this site, nor on any features that are undesignated but may potentially qualify for designation under the habitats or birds directives.

3.4.2 Other issues

As stated in Section 3.1, Japanese knotweed and giant hogweed, species listed on Schedule 3 of the *Birds and Habitats Regulations, 2011*, have been recorded in the past in the local area, including within the Murragh Spit (within Baldoyle Bay SAC and SPA) and within the proposed development area itself. Long-term management of these species has been undertaken and will continue to be carried out into the future, until it is confirmed that the species are eradicated from the subject area.

In addition there is a risk that during construction these species could be introduced to the site. Avoidance of such risk will be managed during the construction period and no such species will be planted or deliberately imported to the site.

4 Appraisal of potential Impacts on European Sites

4.1 Introduction

Potential impacts on European sites may arise as a result of the proposed development, for the following reasons:

- Potential construction effects on European sites:
 - Potential release of contaminated surface water and other contaminants including dust may pose a temporary risk, resulting in potential effects on the Special Conservation Interests and Qualifying Interests of Baldoyle Bay SPA and SAC;
 - Potential loss of feeding grounds on open agricultural and amenity grassland as well as other habitats may pose a temporary risk, resulting in potential effects on the Special Conservation Interests of Baldoyle Bay SPA, Malahide Estuary SPA and North Bull Island SPA;
 - Potential disturbance to birds, such as that caused by noise, vibration, physical or visual disturbance may pose a temporary risk, resulting in potential effects on the Special Conservation Interests of Baldoyle Bay SPA, Malahide Estuary SPA and North Bull Island SPA;
- Potential operational effects on European sites:
 - Potential release of contaminated surface water, may pose a long-term risk, resulting in potential effects on the Special Conservation Interests and Qualifying Interests of Baldoyle Bay SPA and SAC;
 - Potential loss of feeding grounds on open agricultural and amenity grassland, as well as other habitats may pose a long-term risk, resulting in potential effects on the Special Conservation Interests of Baldoyle Bay SPA, Malahide Estuary SPA and North Bull Island SPA;
 - Potential physical or visual disturbance to birds, such as that caused by proximity to people and human activity may pose a long-term risk, resulting in potential effects on the Special Conservation Interests of Baldoyle Bay SPA, Malahide Estuary SPA and North Bull Island SPA;
 - Potential loss of habitat within a European site may pose a permanent risk, resulting in potential effects on the Special Conservation Interests and Qualifying Interests of Baldoyle Bay SPA and SAC, Malahide Estuary SPA and North Bull Island SPA.

4.2 Conservation objectives, threats and vulnerabilities of the European Sites

A key aim of the Habitats Directive is to '*maintain or restore the favourable conservation status of habitats and species of community interest*'. Site-specific conservation objectives aim to define favourable conservation condition for particular habitats or species within a European site. In the case of European sites for which site-specific conservation objectives have not yet been prepared, generic conservation objectives have been provided by NPWS.

The integrity of a site is the coherence of its ecological structure and function, across its whole area, which enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified.

Site specific conservation objectives for **Baldoyle Bay SAC** were published on 19th November 2012. The conservation objectives are:

- To maintain the favourable conservation condition of each of the Qualifying Interests (habitats), as defined by the range of attributes and targets set out;

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- The attributes include habitat area, habitat distribution, physical structure (sediment supply, creeks & pans and flooding regime), vegetation structure (zonation, vegetation height, vegetation cover), vegetation composition (typical species, negative indicators);
- For each attribute the target as set out in the Conservations Objectives document is to maintain the existing conditions.

Site specific conservation objectives for **Baldoyle Bay SPA** were published on 27th February 2013. The conservation objectives are:

- To maintain the favourable conservation condition of each of the Special Conservation Interests (the bird species and the wetland habitat), as defined by the range of attributes and targets set out;
- The attributes include population trend and distribution (bird species) as well as the wetland habitat;
- For each attribute the target as set out in the Conservations Objectives document is as follows:
 - Population trend: the long term population should be stable or increasing;
 - Distribution: There should be no significant decrease in the range, timing or intensity of use of areas by waterbird species of Special Conservation Interest other than that occurring from natural patterns of variation;
 - Wetland habitat: The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 263ha, other than that occurring from natural patterns of variation.

Site specific conservation objectives for **Malahide Estuary SPA** were published on 16th August 2013. The conservation objectives are:

- To maintain the favourable conservation condition of each of the Special Conservation Interests (the bird species and the wetland habitat), as defined by the range of attributes and targets set out;
- The attributes include population trend and distribution (bird species) as well as the wetland habitat;
- For each attribute the target as set out in the Conservations Objectives document is as follows:
 - Population trend: the long term population should be stable or increasing;
 - Distribution: There should be no significant decrease in the range, timing or intensity of use of areas by waterbird species of Special Conservation Interest other than that occurring from natural patterns of variation;
 - Wetland habitat: The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 1713ha, other than that occurring from natural patterns of variation.

Site specific conservation objectives for **North Bull Island SPA** were published on 9th March 2015. The conservation objectives are:

- To maintain the favourable conservation condition of each of the Special Conservation Interests (the bird species and the wetland habitat), as defined by the range of attributes and targets set out.
- The attributes include population trend and distribution (bird species) as well as the wetland habitat;
- For each attribute the target as set out in the Conservations Objectives document is as follows:
 - Population trend: the long term population should be stable or increasing;
 - Distribution: There should be no significant decrease in the range, timing or intensity of use of areas by waterbird species of Special Conservation Interest other than that occurring from natural patterns of variation;
 - Wetland habitat: The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 263ha, other than that occurring from natural patterns of variation.

4.3 Appraisal of Likely effects on European Sites

4.3.1 Predicted potential impacts on the conservation objectives of the European sites

4.3.1.1 Predicted potential impacts on the conservation objectives of Baldoyle Bay SAC

The conservation objective is to maintain the favourable conservation condition of each of the habitats that are listed as Qualifying Interests in Baldoyle Bay SAC.

Potential impacts on habitat area, habitat distribution, physical structure, vegetation structure and vegetation composition, due to scouring, erosion, pollution, sedimentation, spread of invasive species or loss of or damage to Qualifying Interest habitat will be avoided by appropriate construction and water management measures as set out in Section 4.4 of this NIS, the Water Quality Report (Appendix 4) and the Construction Management Plan (Appendix 5).

4.3.1.2 Predicted potential impacts on the conservation objectives of Baldoyle Bay SPA

The conservation objective is to maintain the favourable conservation status of the six bird species which are listed as Special Conservation Interests in Baldoyle Bay SPA, as well as the wetland habitat in the SPA.

The measures prescribed in Objective GI 12 of the Portmarnock South LAP 2013 (*i.e.* agreed habitat protection measures) have been implemented as part of the Portmarnock Phase 1A development (see Section 3.1) and are subject to ongoing monitoring and management. These measures seek to prevent any changes in bird populations due to any reduction in available feeding habitat or disturbance. In particular the provision of the new dedicated grassland areas in quiet zone lands that have been designed to provide feeding habitat for the birds of Baldoyle Bay SPA will avoid any significant impacts on feeding habitats and disturbance to birds during roosting or feeding.

In addition, potential impacts on habitat quality within Baldoyle Bay SPA due to changes to water quality and water flows will be avoided by appropriately designed construction and water management measures, as set out in Section 4.4 of this NIS, the Water Quality Report (Appendix 4) and the Construction Management Plan (Appendix 5).

Together, these measures will ensure that the attributes and their respective targets defined as part of the conservation objectives for the SPA, will be not be impacted upon by the proposed development.

4.3.1.3 Predicted potential impacts on the conservation objectives of Malahide Estuary SPA and North Bull Island SPA

The conservation objectives for these two SPAs are to maintain the favourable conservation status of the bird species which are listed as Special Conservation Interests in each SPA, as well as the wetland habitat in the SPAs. The measures implemented to protect Baldoyle Bay SPA as described in Section 4.3.1.2 will address any potential impacts on these SPAs.

4.3.2 Potential effects on European sites during construction

4.3.2.1 Disturbance via noise, vibration and human activities

Noise, vibration and visual disturbance may impact on the species of Baldoyle Bay SAC and SPA, for example by reducing feeding time or causing birds to temporarily avoid certain areas. While this may occur during site clearance and construction of the houses associated with the proposed development, given their location, adjacent to Phase 1A and on the west side of the tree lined hedgerow to be retained as a linear park (along the townland boundary) these impacts are not expected to be significant, particularly given the mitigation measures that have already been implemented as part of the Portmarnock South LAP as associated with the Phase 1A development. However development of the regional wetland and outfall to Baldoyle Bay, may, given their proposed location, pose a temporary slight negative impact on Baldoyle Bay SPA. The works are adjacent to the R016 Coast Road.

4.3.2.2 Water quality, dust and other emissions

All construction activities pose a potential risk to watercourses as surface water arising at any site may contain contaminants. The main contaminants arising from construction and demolition activities may include suspended solids, hydrocarbons and concrete/cement products. If not properly managed, such pollutants could pose a temporary risk to surface water quality in local watercourses during the demolition and construction phases. In addition there is a potential risk to flora and fauna arising from dust deposition, which in extreme cases can inhibit photosynthesis in plants and can increase turbidity in water courses.

Given the nature, scale and duration of the construction phase for the proposed development there is the potential for temporary slight negative impacts on Baldoyle Bay SAC and SPA.

4.3.2.3 Site compound location and haulage routes

The locations of the haul routes and the project site compound are shown in the Construction Management Plan. The site compound will be located to the west of the existing north-south tree lined hedgerow that traverses the site (the townland boundary) and as such, it is not expected that there will be any impacts on the bird species of the SPA. Should any haul routes (or a construction compound) be located to the east of the tree line, for example in the vicinity of the proposed regional wetland there is the potential for temporary, moderate negative impacts on the bird species of the SPA, if these works take place in the winter months. Temporary haul routes will be located east of the hedgerow for the duration of the wetland/outfall construction. This will be outside of the overwintering season and no impacts on the bird species overwintering in the SPA will arise.

4.3.2.4 Lighting

Lighting during the construction phase will be limited to the site compound and residential development areas west of the townland hedgerow only. Given the location of the site compound it is not expected that there will be any impacts on the bird species of the SPA. Potential impacts via lighting on other ecological receptors (i.e. bats) are assessed in the accompanying Biodiversity Report.

4.3.3 Potential effects on European sites during operation

4.3.3.1 Loss of, or disturbance to, habitat, including feeding habitat for birds

The proposed development site (i.e. the residential area, the regional wetland site and the proposed outfall to Baldoyle Bay) is not considered to be an important feeding site for the bird species (the Special Conservation Interests) associated with Baldoyle Bay SPA (and, given the complex and interlinked relationships between the birds and their habitat use throughout the wider area of the Dublin coastline and beyond, the SCIs of North Bull Island SPA and Malahide Estuary SPA). Furthermore, the significant measures that have been undertaken and that are currently being managed for wildlife and that stem from the Portmarnock South LAP will ensure that potential 'in-combination effects' potentially arising out of the full implementation of the LAP and other projects (see Section 4.5) will not result in the loss of feeding habitat for the Special Conservation Interests of the SPA, in particular the light-bellied Brent geese, an Internationally important population of which is associated with these SPAs.

A survey has been undertaken by BEC Consultants Ltd (see Appendix 3) in order to determine if any Annex I habitats were present at the proposed surface water outfall location within Baldoyle Bay SAC. The survey found that within the wider vicinity of the proposed outfall, two Annex I habitats are present (Atlantic salt meadows and mudflats and sandflats not covered by seawater at low tide). Species recorded in the Atlantic saltmarsh (lower saltmarsh) habitat included sea purslane (*Atriplex portulacoides*) and common saltmarsh grass (*Puccinellia maritima*) as well as areas of thrift (*Armeria maritima*), sea plantain (*Plantago maritima*), sea arrowgrass (*Triglochin maritimum*), sea aster (*Aster tripolium*) and long-bracted sedge (*Carex extensa*). Smaller areas of upper saltmarsh were also recorded and species noted included saltmarsh rush (*Juncus gerardii*) and red fescue (*Festuca rubra*) as well as sea milkwort (*Glaux maritima*), common scurvygrass (*Cochlearia officinalis*) and sea aster. Lax-flowered sea-lavender (*Limonium humile*)

was also recorded. Common cord-grass (*Spartina anglica*), a species listed on Schedule 3 of the *Birds and Habitats Regulations, 2011*, was also recorded within the study area, but not near or within the proposed development area.

The development of the surface water outfall, together with its concrete headwalls and apron, will require the removal of c. 43m² of habitat within the site boundary of Baldoyle Bay SAC and SPA. However, the habitat to be removed comprises an area of dry/neutral grassland and scrub that occurs largely on the verge between the road itself and the mudflats and saltmarsh habitats that are Qualifying Interests in the SAC. Species present in this area included common couch (*Elytrigia repens*), false oat-grass (*Arrhenatherum elatius*), perennial sow-thistle (*Sonchus arvensis*), large bindweed (*Calystegia silvatica*), field bindweed (*Convolvulus arvensis*), nettle and bramble. Sea beet (*Beta vulgaris* ssp. *maritima*) and sea mayweed (*Tripleurospermum maritimum*) were occasional, according to the habitat survey undertaken in this location by BEC Ltd. Notably, the protected species Borrer's saltmarsh-grass (*Puccinellia fasciculata*) and meadow barley (*Hordeum secalinum*) were not recorded within the study area.

The headwall / outfall has been designed so that no structures will be constructed within an area of Annex 1 habitat. This exclusion from Annex 1 habitat will be further reaffirmed prior to construction works by means of an additional pre-construction survey. The development of the proposed surface water outfall will therefore result in no loss of any Annex 1 habitat, nor any habitat that may form part of the natural succession from mudflat to saltmarsh. The area is also not suitable for use by feeding birds, including light-bellied Brent geese. This habitat loss is not considered significant, and the loss will not cause any delay in progressing towards achieving the conservation objectives of the European sites.

The loss of the area of non-Annex habitat on the edge of Baldoyle Bay SAC adjacent to Coast Road is not an impact on the integrity of Baldoyle Bay SAC. As outlined in the judgement in the Sweetman Case from the European Court of Justice (C-258/11), in order for the integrity of a site not to be adversely affected, the site needs to be preserved at a favourable conservation status, and this entails 'the lasting preservation of the constitutive characteristics of the site concerned that are connected to the presence of a natural habitat type whose preservation was the objective justifying the designation of that site. It is concluded in this report that the loss of the non-Annex habitat, totalling c.43m² in area (or 0.001% of the total area of the SAC), on the edge of the SAC adjacent to the Coast Road will not significantly impact on the designated features, and will have no impact on the integrity of the site.

There will be no impacts on any of the attributes of either the SAC or the SPA, nor on any of the targets set out for these attributes (see Appendix 6). Further, the loss of this small area of habitat will not affect any of the species that the Annex 1 habitats support, as this area has no role in the maintenance of these habitats, or the species located therein.

The presence of the new structure, as modelled in the RPS study (see Appendix 2), will have no impact on surface water flows and run-off in the estuary, either locally or in a across a wider area. There will be no change to the dynamics of the relationships that define the complex habitat structures within the site.

The loss of this very small area of non-Annex habitat, as shown on Figures 5 and 6, will not impact in any way on the key habitats in the SAC, in particular the Annex 1 mudflats and saltmarsh habitats that occur in the vicinity of the outfall area.

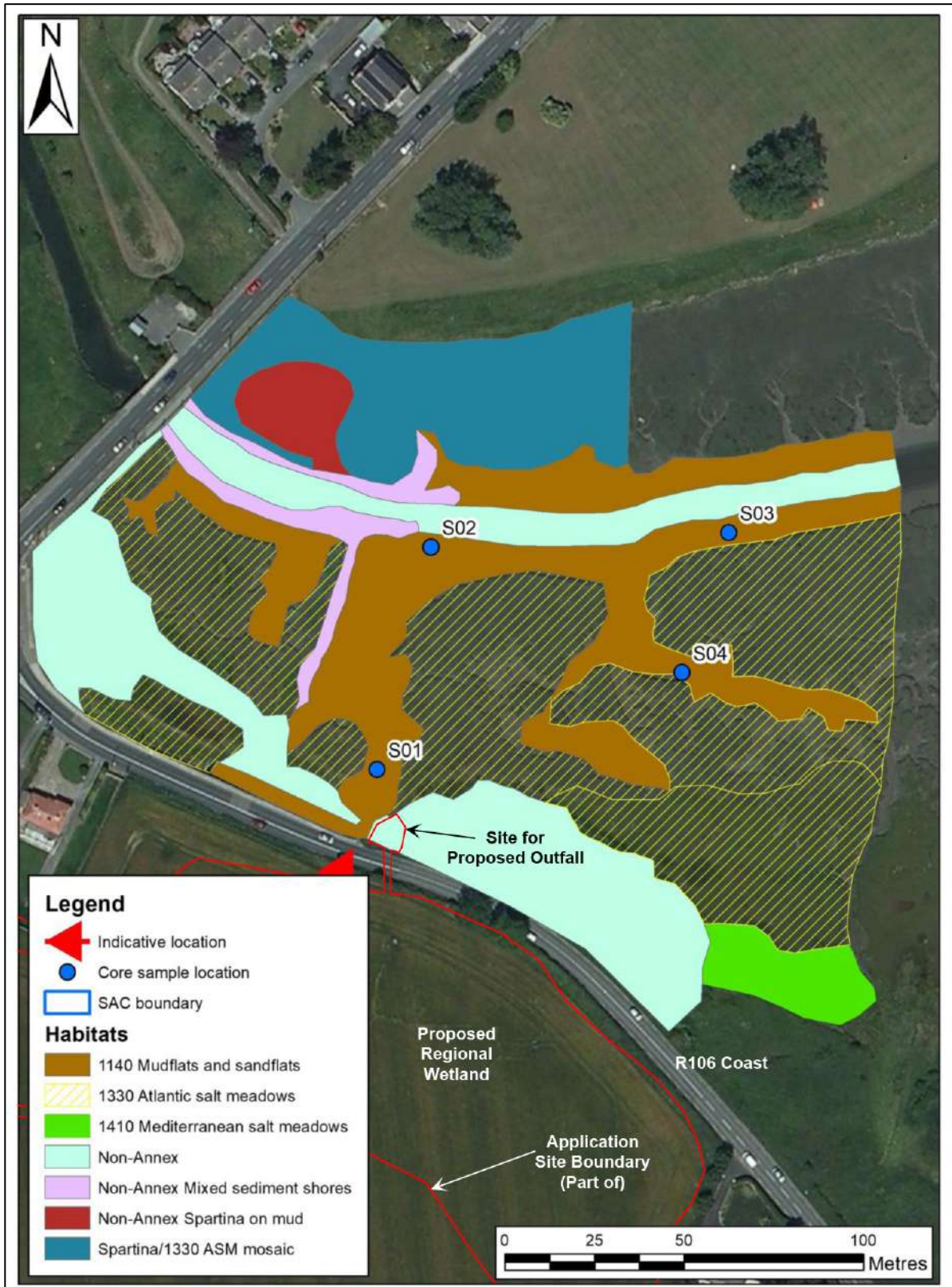


Figure 5 Habitat map extracted from the report prepared by BEC Ltd (*Portmarnock Storm Outfall: Marine and Coastal Habitats*)



Figure 6 Proposed location of the storm water outfall

4.3.3.2 Surface and foul water

The proposed development will incorporate a new surface water outfall to Baldoyle Estuary, via a regional wetland, as described in Section 4.3.3.1. In addition to the physical presence of the structures there is the potential for any change in surface water flows arising to cause scouring or erosion of habitats within Baldoyle Bay SAC. Associated with any such changes to the water flow regime is the potential for effects on the aquatic habitats of the SAC.

However, according to the modelling exercise undertaken by RPS Ltd (refer to Appendix 2) the computational model studies have shown that any increase in the flow velocities due to the proposed storm water outfall discharge are restricted to the channel leading from the proposed outfall to the River Sluice channel. The increase in the flow velocities away from the immediate area of the outfall structure itself will be less than 0.1 m/s even during a 1 in 100 year return period storm event. Thus the proposed storm water outfall will have no significant impact on the overall flow regime of the Baldoyle Estuary.

Modelling of the changes in the sediment transport regime resulting from the operation of the proposed storm water outfall indicates that there will be no significant bed erosion in the estuary channels as a result of storm water discharge for return periods of up to and including 1 in 100 years. Thus the proposed storm water outfall is not expected to have any significant impact on the overall sediment transport regime of the estuary.

The results of the study, which confirm that there will not be a significant impact on the hydraulic or sedimentation regime of the estuary from the proposed storm water discharge, is consistent with the fact that the storm river flows in the Baldoyle Estuary are more than 30 times larger than the proposed storm water outfall discharge.

It can therefore be concluded beyond all reasonable scientific doubt that there will be no impact on either the Qualifying Interests and Special Conservation Interests of Baldoyle Bay SAC or SPA from this element of the proposed development.

Any change to surface water quality associated with the development may affect the habitats and species of the SAC and SPA. Associated with any such changes to water quality is the potential for a slight negative impact on the aquatic habitats and bird species of the SAC and SPA.

In addition, there is the potential for a moderate negative impact on the aquatic habitats of the SAC via foul water arising out of any potential overflows from Mayne Road foul pumping station, once the development is operational.

4.4 Mitigation measures

4.4.1 Construction phase mitigation

All construction works will comply with legislative requirements and best practice, as well as Portmarnock South Local Area Plan. Further, there is the potential that other projects, including the proposed Irish Water Pumping Station and the Baldoyle to Portmarnock Coastal Path and Cycleway, may, if their respective planning applications are successful, be commenced at a similar time. As such there is the potential for cumulative effects arising, as appraised in Section 4.5 of this report, however, it is intended that all of the projects being undertaken will be developed in a co-ordinated manner, allowing a coherent approach to mitigation for all of these separate projects.

A Construction Management Plan (refer to Appendix 5) has been prepared by Linesight Ltd. and all works will comply with the requirements of this document. The mitigation measures comprise the following:

- NPWS will be notified one month prior to commencement of site clearance and development works;
- A suitably qualified and experienced ecologist will be contracted for the entire duration of the construction phase. The ecologist will monitor the construction works to ensure full implementation of all mitigation measures and will be authorised to contact NPWS and Fingal County Council should this be necessary. The ecologist will undertake or arrange and manage all pre-construction surveys that may be necessary to ensure compliance with planning conditions and legislation;
- The working period for the development of the regional wetland, including the construction of the outfall to Baldoyle Bay will be restricted, with no such works being permitted between the months of November and March inclusive;
- No such seasonal restrictions are considered necessary for the construction of the residential development itself. As appraised in Section 4.3, there will be no impacts on the bird species of Baldoyle Bay SPA nor on the habitats or species of Baldoyle Bay SAC arising from this element of the proposed development. This is due in part to the location of the proposed development (to the west of the north south tree-lined hedgerow (townland boundary within proposed linear park) and the fact that significant mitigation measures (the newly created bird quiet zone and ecological buffer zone habitat) have been implemented as part of the Phase 1A development;
- The site compound will be located to the west of the townland boundary, and any haul roads associated with the development of the regional wetland will utilise existing gaps in the townland boundary;
- The working site for the proposed surface water outfall will be reduced to the minimum practicable area. In particular no working will be permitted with the area of Annex 1 habitat that is adjacent to the proposed outfall location. On completion of this element of the works, the area of grassland/scrub will be regraded and reseeded;
- The contractor will take all adequate precautions as part of the construction methodology (in particular during the works within the boundary of the SAC and SPA that are required for the installation of the surface

water outfall) to avoid any pollution from construction activities via run-off to the surface water drainage network or directly to Baldoyle Bay. Petrol interceptors and temporary attenuation and settlement facilities may be required in appropriate locations during construction and are described in the accompanying Construction Management Plan. In order to further ensure that there are no impacts on either designated sites or on water quality and water flow velocities in general during the construction works, all hazardous substances, such as fuels, oils, cement and concrete products will be stored on-site in secure, bunded areas remote from drainage connections to the existing surface water drainage network.

- In addition to taking full account of the Construction Management Plan the contractor will put in place a risk assessment in order to ensure compliance. Any necessary discharge permits and licences will be obtained.
- All retained trees that are within or close to the working wayleave of the proposed development (e.g. along Station Road and Coast Road, and internally, along the townland boundary) will be protected in accordance with the requirements of British Standard BS5837:2012 *Trees in Relation to Design, Demolition and Construction' – Recommendations*, with protective fencing being installed around all trees to be retained, prior to commencement of development;
- The implementation and effectiveness of these standard measures proposed will be inspected and recorded regularly during the entire works period by the contractor and where deficiencies or faults are identified the contractor will immediately remedy them. These measures will ensure that there will be no impacts on water flows or quality, and therefore no impacts on the qualifying interests of any designated sites as a result of the proposed development works.
- All plant will be fully maintained and in full working order, for example with engine covers in place to reduce noise. No works will be undertaken outside permitted hours;
- Traffic management measures, as detailed in the Construction Management Plan will be designed to reduce potential impacts of dust and other emissions. This will include signposting and fencing to prevent vehicular access outside the working area, water tanker use to dampen works areas and suppress dust as required. Construction waste will be dealt with in accordance with the Construction Management Plan or the project Construction Waste Management plan;
- Should it be necessary, and where feasible and practicable, the removal of trees and other features suitable for use by nesting birds will be undertaken outside the bird nesting season (avoiding the period 1st March to 31st August). Should the construction programme require vegetation clearance between March and August bird nesting surveys will be undertaken by suitably experienced ecologists. If no active nests are recorded, vegetation clearance will take place within 24 hours. In the event that active nests are observed, an appropriately sized buffer zone will be maintained around the nest until such time as all the eggs have hatched and the birds have fledged – a period that may be three weeks from the date of the survey. Once it is confirmed that the birds have fledged and no further nests have been built or occupied, vegetation clearance may take place immediately;
- No bat roosts have been recorded at Portmarnock Phase 1B and it will not be necessary to apply for a derogation licence under Regulation 54 or 55 of the *European Communities (Birds and Natural Habitats) Regulations 2011* (S.I. 477/2011). However any mature tree scheduled for removal will first be surveyed by a qualified bat specialist for the presence of bats. Any ivy-covered trees which require felling should be left to lie for 24 hours after cutting to allow any bats beneath the cover to escape. Trees with potential for bat roosting i.e. those showing cavities, should be felled in the presence of a bat specialist in case bats are present. If found, such animals should be safely retained in an escape-proof container until nightfall then released onsite;
- Disturbance to bats from lighting during construction will be prevented by ensuring that light spillage outside the working area does not occur.

4.4.2 Operational phase mitigation

4.4.2.1 Surface water management

Stormwater management will be undertaken in accordance with the principles of Sustainable urban Drainage Systems. The operational and maintenance measures for the SuDS features are fully detailed in Appendix 4 (the Water Quality Report prepared for this NIS by JB Barry Ltd). In summary *The SuDS strategy adopted for the proposed Phase 1B development provides a comprehensive approach to the management of surface water on the site in line with the SuDS triangle namely, water quality, water quantity and amenity/biodiversity. The treatment train approach has been adopted for the design of the surface water system for the development. This approach uses suitable SuDS measures in providing source, site and regional controls. The SuDS recommendations included in the Portmarnock South LAP have been assessed and have been included where deemed appropriate and suitable for this development. The surface water wetland is included as one of the essential SuDS measures for the development.*

As detailed in Appendix 4, the foul and surface water sewer networks for the proposed development will be on separate systems. No foul effluent will discharge to the surface water system. The surface water system for the entire Portmarnock South LAP lands is divided into two catchments namely:

Catchment No 1 (c. 37.55 ha as shown in Figure 7)

Catchment No 2 (c. 1.77 ha along Station Road as shown in Figure 7)



Figure 7 Surface water catchments for the Portmarnock South LAP lands. The area in blue is accommodated in the new regional wetland, to be delivered as part of Phase 1B. The area in orange is accommodated in a new detention basin, also to be delivered as part of Phase 1B.

Catchment No 1 includes the majority of the Phase 1B area and drains to the Baldoyle Estuary via the proposed regional wetland and new surface water outfall. The surface water network for Catchment No 1 has been designed

to cater for the existing Phase 1A, the proposed Phase 1B and future phases of the residential zoned lands within Portmarnock South LAP Development, with the exception of Catchment No 2. Catchment No 2, containing the remainder of Phase 1B, drains via the proposed detention pond to the existing surface water network in Station Road prior to discharge through an existing surface water outfall to the Baldoyle Estuary.

4.4.2.2 Foul water management

Foul effluent in the Portmarnock area drains to the existing Portmarnock Bridge pumping station from where it is pumped to a 225mmØ foul sewer in Coast Road, and then flows by gravity to the wet well of the Mayne Road pumping station. Effluent is then pumped from the Mayne Road pumping station to the North Fringe Sewer which in turn is connected to the Sutton Pumping Station. Effluent from the Sutton Pumping Station is pumped across Dublin Bay via a submarine pipeline to the Ringsend Waste Water Treatment Plant.

Due to capacity issues with the existing Portmarnock Bridge pumping station, Irish Water is advancing plans to construct a new pumping station to replace the existing one on lands northwest of the Portmarnock Bridge roundabout. The new pumping station will be connected directly to the North Fringe Sewer and will cater for all flows from the Portmarnock South LAP lands and all flows from the decommissioned Portmarnock Bridge pumping station. The provision of the new IW pumping station will allow for the downsizing of the Mayne Road pumping station, which will then cater for local flows only. Irish Water is scheduled to make a planning application for the new pumping station in the near future and the pumping station is scheduled for completion in Q3 2019 subject to the statutory processes.

The planning permission for Phase 1A permitted foul effluent to drain by gravity to the existing 225mm sewer in Coast Road and then to the Mayne Road pumping station. A condition of the Phase 1A permission is that the pumping station is upgraded by carrying out the following works:

- Provide an additional duty assist/stand by pump;
- Reconfigure and upgrade the existing internal pipework and cabling;
- Provide a connection point in the control panel for a mobile generator.

These works are in progress and will be complete by the end of January 2018. On completion, the works will provide an enhancement on the current position and will have a positive impact on the Mayne River and Baldoyle Estuary.

The current risk of overflowing to the Mayne River is low and Fingal County Council has advised only 2 overflows occurred in the past year. It is understood there were no pump failures during these overflows and that they occurred during extreme rainfall events. The installation of the new pumping regime as outlined above will reduce the risk of overflowing to the Mayne River.

The upgrade is consistent with the requirements set out for the Mayne Road pumping station in Section 9.2, (Wastewater Network and Treatment) of Portmarnock South LAP.

Flows from the proposed Phase 1B development (150 units) will drain to a temporary pumping station with 24-hour emergency storage located in the northeast corner of the site. These flows will be pumped to the existing 225mm outfall sewer. This sewer is connected to the Mayne Road pumping station, currently being upgraded as described above. A telemetry link will be provided between this temporary pumping station and the Mayne Road pumping station. The purpose of this link is to ensure that no foul effluent will discharge to the Mayne Road pumping station when capacity at the Mayne Road pumping station is limited, *i.e.* during periods of heavy rain or when the pumping station is not operating. Under these conditions, the effluent will drain to the emergency storage tank.

Agreement has been reached with Irish Water for this connection with 24-hour emergency storage (refer to Irish Water's Confirmation of Feasibility Statement included in Appendix 4) as an interim measure pending the construction of the new Irish Water pumping station to replace the existing Portmarnock Bridge pumping station. When the new Irish Water pumping station is operational, all effluent from the Portmarnock South LAP lands will be permanently diverted into the new pumping station. The proposed new pumping station and associated works are consistent with the requirements set out in Portmarnock South LAP.

The upgrade of the existing Mayne Road pumping station and the replacement of Portmarnock Bridge pumping station will significantly reduce the risk of overflow events. These provisions will have a positive cumulative effect on the Mayne River and Baldoyle Estuary.

4.4.2.3 Other measures

Other measures, including the ongoing and full implementation of the Conservation Management Plan (prepared by Brady Shipman Martin and implemented as part of Phase 1A) and ongoing implementation of management measures to eliminate invasive terrestrial species (i.e. giant hogweed and Japanese knotweed) will ensure no significant effects arise on any ecological receptors as a result of the proposed development.

4.4.3 Monitoring

In order to ensure the successful implementation of all of the proposed mitigation measures an Ecological Clerk of Works will be appointed for the duration of the construction period.

Water quality monitoring will be undertaken at locations agreed with Fingal County Council, for the duration of the construction period. Should it be necessary, measures to rectify any exceedances of water quality parameters will be undertaken.

4.5 Appraisal of likely significant effects on European sites and in-combination effects

It is a requirement of the *Birds and Natural Habitats Regulations*, 2011 that when considering whether a plan or project will adversely affect the integrity of a European site the assessment must take into account in-combination effects with other current or reasonably foreseeable plans and projects.

- If it can be clearly demonstrated that the plan or project will not result in any impact on the integrity of a European site then the plan or project should proceed without considering the in-combination test; further,
- If there are identified effects arising from the plan or project even if they are perceived as minor and not likely to have an impact on the integrity of a European site alone, then any such impacts must be considered 'in-combination' with the effects arising from other plans and projects.

The requirements of the Portmarnock South Local Area Plan, 2013 (which includes reference to proposed residential development, of which the current application is part) include the development of the regional wetland and a permanent pumping station.

The foul water pumping station (LAP Objective WW1) will be delivered by Irish Water, at a location to be confirmed, most likely at a location to the northwest of the junction of Strand Road, Station Road and Coast Road. Irish Water, via its consultants, Mott MacDonald Ireland Ltd., has confirmed that it has undertaken screening for Appropriate Assessment and has concluded that the proposed development will not result in any significant effects on any European sites. It should be noted that the pumping station is not necessary for the delivery of the current application, which is restricted to 150 units, that can be accommodated by the existing foul water pumping station at Mayne Road. Irish Water has confirmed this, in a letter dated July 2017 and included in Appendix 4 of this document).

The regional wetland (LAP Objective SW 7) will be delivered as part of the current planning application. With the exception of a small section of the LAP area (which will be catered for by a separate detention basin adjacent to Station Road – see Figure 7) this regional wetland will be designed to accommodate the fully developed residential lands within the entire LAP area, which may comprise up to 1200 units. The appraisal of this regional wetland forms part of the current application.

As previously noted in this document, significant biodiversity protection and enhancement measures required as part of the Portmarnock South LAP have already been implemented as part of the Phase 1A development.

In addition to the Portmarnock South LAP, Fingal County Council has developed a separate Local Area Plan, for the Baldoyle and Stapolin lands, immediately south of the Portmarnock South LAP area. The Baldoyle Stapolin Local Area Plan, 2013 similarly includes required mitigation measures to deal with any potential impacts arising out of the development of housing in close proximity to Baldoyle Bay. These measures include the development of new biodiversity zones including Mayne Marsh Conservation Area and an area known as Racecourse Regional Park, as part of an overall green infrastructure strategy to maintain habitats within Baldoyle Bay SPA and SAC at favourable conservation condition and ensure the ecological integrity of Baldoyle Bay.

Fingal County Council proposes to develop a new coastal route, the Baldoyle to Portmarnock Coastal Path and Cycleway. This project is an objective of the Racecourse Park masterplan. The coastal route, which also includes a standalone NIS, will guide the new and existing residents of the lands covered by the two LAPs, as well as visitors from other areas, away from the more sensitive estuarine lands. Bird survey work undertaken and to be submitted as part of the planning application for that scheme (*Baldoyle to Portmarnock Coastal Path and Cycleway: Bird Impact Study*, prepared by Natura Environmental Consultants on behalf of Fingal County Council) has concluded that the *proposed route will not cause any significant impact on the Baldoyle Bay SPA or the Baldoyle Bay SAC. The path and cycleway will not interfere with the distribution or density of the species or habitats that are qualifying interests of these Natura 2000 sites. There is no likelihood that there will be any adverse effects on the favourable conservation condition of these sites.*

Each of the plans and projects under review in this section of the document have been developed with nature conservation as a core element, and an iterative approach to the preparation of each plan and project has been undertaken, with a view to coordinating the plans and projects for maximum overall benefit and minimum impact. Each has been separately subject to stringent appraisal, both for their potential impacts on European sites and their Qualifying Interests/Special Conservation Interests as well as non-European sites and ecological receptors. In each case it has been reasonably concluded, based on the best available scientific evidence, that there will be no significant effects on designated sites, habitats, species or water quality, either alone or in-combination with other plans or projects.

The result of this iterative approach to the planning process has been to prevent the risk of multiple minor impacts arising on the integrity of the European sites which, if taken in isolation would be insignificant but when combined might result in significant effects on the site.

It is concluded that taking into account these plans and projects no other potential cumulative effects on ecological receptors are expected to arise as a result of the proposed development of Portmarnock Phase 1B.

4.6 Residual impacts

Following the implementation of all mitigation measures associated with the proposed development, including the ongoing and continued management of the newly created bird quiet zone and biodiversity buffer zone habitat, there will be no residual impacts on any Annex habitats and no significant impact on any European site arising from the proposed development, including the regional wetland and surface water outfall to Baldoyle Bay.

5 Summary and conclusions

This Natura Impact Statement has considered the potential impacts of a proposal by St. Marnock's DAC II & Clear Real Estate Investments plc for development of 150 residential units (Portmarnock Phase 1B) on the integrity of the relevant European sites.

This report concludes on the best scientific evidence that it can be clearly demonstrated that no elements of the project will result in any impact on the integrity or Qualifying Interests/Special Conservation Interests of any relevant European site, either on their own or in-combination with other plans or projects, in light of their conservation objectives.

Portmarnock Phase 1B

Natura Impact Statement

It is considered that this NIS provides sufficient relevant information to allow the Competent Authority (An Bord Pleanála) to carry out an AA Screening, and if necessary an Appropriate Assessment, and to reach a determination that the proposed development will not affect the integrity of any of the relevant European sites under Article 6 of the Habitats Directive (92/43/EEC) in light of their conservation objectives.

6 References

- Council of the European Communities (1992) Council Directive of 21 May 1992 on The Conservation of Natural Habitats and of Wild Fauna and Flora (92/43/EEC). O. J. L 206/35, 22 July 1992
- DoEHLG (2010) Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities (Department of Environment, Heritage and Local Government, Rev. Feb 2010)
- DoCHG (2017) Third National Biodiversity Plan 2017-2021
- Environmental Protection Agency (2002). *Guidelines on the information to be contained in Environmental Impact Statement*. Environmental Protection Agency. Wexford
- Environmental Protection Agency (2003). *Advice Notes on Current Practice (in the preparation of Environmental Impact Statements)*. Environmental Protection Agency. Wexford
- Environmental Protection Agency (2015). Revised (Consultation Draft) Advice Notes on Current Practice (in the Preparation of Environmental Impact Statements)
- Revised Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (May 2017);
- European Commission (EC) (2000). Managing Natura 2000 sites: The Provisions of Article 6 of the Habitat's Directive 92/43/EEC (EC Environment Directorate-General, 2000)
- European Commission (EC) (2001). Assessment of Plans and Projects Significantly Affecting Natura 2000 sites: Methodological Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC (European Commission Environment Directorate-General)
- European Commission (EC) (2015 (DRAFT). Managing Natura 2000 sites: The Provisions of Article 6 of the Habitats Directive 92/43/EEC. (Draft Guidance issued by the European Commission, April 2015)
- European Communities (Birds and Natural Habitats) Regulations 2011 (SI No. 477 of 2011)
- NPWS (2010). Circular NPW 1/10 & PSSP 2/10 Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities. (Department of Environment, Heritage and Local Government, March 2010)
- NPWS (2013a). The Status of EU Protected Habitats and Species in Ireland. Species Assessments Volume 2, Version 1.0. Unpublished Report, National Parks & Wildlife Services. Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland
- NPWS (2013b). The Status of EU Protected Habitats and Species in Ireland. Species Assessments Volume 3, Version 1.0. Unpublished Report, National Parks & Wildlife Services. Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland
- Online data available on European sites as held by the National Parks and Wildlife Service (NPWS) (www.npws.ie/protectedsites)
- Planning and Development, Act 2000, as amended.

Appendices

Appendix 1 – Background to Appropriate Assessment

The European¹ network is a Europe-wide network of ecologically important sites (SPAs and cSACs – also known as ‘European Sites’ or ‘Natura 2000 sites’) that have been designated for protection under either the EU Birds Directive (Council Directive 79/409/EEC on the Conservation of Wild Birds) or the EU Habitats Directive (Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna).

The main aim of the Habitats Directive is “to contribute towards ensuring biodiversity through the conservation of natural habitats of wild fauna and flora in the European territory of the Member States to which the treaty applies”. Any actions taken must be designed to “maintain or restore, at a favourable conservation status, natural habitats and species of wild fauna and flora of Community interest”. Under Article 6 of the Habitats Directive, an assessment is required where a plan or project may give rise to significant effects upon a European site.

In addition, it is a matter of law that candidate SACs (cSACs) and Sites of Community Importance (SCI) are considered in this process;

Article 6 (paragraphs (3) and (4)) of the Habitats Directive states that:

- (3) Any plan or project not directly connected with or necessary to the management of the site but likely to have significant effect thereon, either individually or in combination with other plans or projects, shall be subject to Appropriate Assessment of its implications for the site in view of the site’s conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.
- (4) If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of social or economic nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of European is protected. It shall inform the Commission of the compensatory measures adopted.”

The requirements of the Habitats Directive are transposed into Irish law by means of the *European Communities (Birds and Natural Habitats) Regulations 2011* (hereafter referred to as the *Birds and Habitats Regulations*)² and by the *Planning and Development Act 2000*, as amended.

In Ireland, the statutory agency responsible for the designated areas is NPWS.

¹ The EU Habitats Directive, Article 3.1, states “A Coherent European ecological network of Special Areas of Conservation and Special Protection Areas pursuant to Directive 79/409/EEC shall be set up under the title European”

² SI No. 477 of 2011

Stages in the assessment

European Commission guidance (2001)³ sets out the principles on how to undertake decision making in applying the Habitats Directive. The requirements of the Habitats Directive comprise four distinct stages:

Stage 1: Screening is the process which initially identifies the likely significant effects upon a European site of a project or plan, either alone or in combination with other projects or plans. It is important to note that the burden of evidence is to show, on the basis of objective information, that there will be no significant effect; if the effect may be significant, or is not known, that would trigger the need for an Appropriate Assessment. There is European Court of Justice case law to the effect that unless the likelihood of a significant effect can be ruled out on the basis of objective information, then an Appropriate Assessment must be made.

Stage 2: Appropriate Assessment is the detailed consideration of the impact on the integrity of the European site of the project or plan, either alone or in combination with other projects or plans, with respect to the site's conservation objectives and its structure and function. This is to determine with scientific certainty whether or not there will be adverse effects on the integrity of the site in light of its conservation objectives. This stage also includes the development of mitigation measures to avoid or reduce any possible impacts.

Stage 3: Assessment of alternative solutions is the process which examines alternative ways of achieving the objectives of the project or plan that would avoid impacts on the integrity of the European site, should avoidance or mitigation measures be unable to cancel out adverse effects.

Stage 4: Assessment where no alternative solutions exist and where adverse impacts remain. At Stage 4 an assessment is made with regard to whether or not the development is necessary for imperative reasons of overriding public interest (IROPI) and, if so, of the compensatory measures needed to maintain the overall coherence of the European network.

Conservation objectives of European sites

The conservation objectives for a European Site are intended to represent the aims of the Habitats and Birds Directives in relation to that site. To this end, habitats and species of European Community importance should be maintained or restored to 'favourable conservation status' (FCS), as defined in Article 1 of the Habitats Directive below:

The conservation status of a natural habitat will be taken as 'favourable' when:

- Its natural range and the area it covers within that range are stable or increasing;
- The specific structure and functions which are necessary for its long term maintenance exist and are likely to continue to exist for the foreseeable future;
- Conservation status of typical species is favourable as defined in Article 1(i).

The conservation status of a species will be taken as favourable when:

- Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats;

³ European Commission (2001) *Assessment of Plans and Projects Significantly Affecting European Sites: Methodological Guidance on the Provisions of Article 6 (3) and (4) of the Habitats Directive 92/43/EEC*

- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future;
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

Guidance from the European Commission⁴ indicates that the Habitats Directive intends FCS to be applied at the level of an individual site, as well as to habitats and species across their European range. Therefore, in order to properly express the aims of the Habitats Directive for an individual site, the conservation objectives for a site are essentially to maintain (or restore) the habitats and species of the site at (or to) FCS.

The European Commission guidance recommends that screening should fulfil the following steps:

- 1** Determine whether the plan (or policy) is directly connected with or necessary for the management of European sites;
- 2** Describe the plan and describe and characterise any other plans or projects which, in combination, have the potential for having significant effects on European sites;
- 3** Identify the potential effects on European sites;
- 4** Assess the likely significance of any effects on European sites.

⁴ Managing European sites: the provisions of Article 6 of the Habitats Directive 92/43/EEC. (European Commission 2000)

Appendix 2 – Baldoyle Estuary Storm Water Outfall Estuary Bed Erosion Study (RPS Ltd)

J B Barry & Partners Ltd

**Baldoyle Estuary Storm Water Outfall
Estuary Bed Erosion Study**

December 2017



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J B Barry & Partners Ltd**Baldoyle Estuary Storm Water Outfall
Estuary Bed Erosion Study****STUDY REPORT****DOCUMENT ISSUE**

Client	J B Barry & Partners Ltd					
Project Title	Baldoyle Estuary Storm Water Outfall - Estuary Bed Erosion Study					
Document Title	Study Report					
Document No.	IBE1396/AKB/Baldoyle-v2					
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1.0 INTRODUCTION

J B Barry and Partners Ltd have been appointed by St Marnock's II DAC to design a storm water outfall to serve residentially zoned land south of Station Road, Portmarnock, Fingal, County Dublin.

The outfall consists of a 525mm diameter concrete pipe with a tideflex valve and concrete apron, the details of which are shown on J B Barry & Partners Ltd Drawing No. Y17205-C-204 Rev F. The proposed outfall is to discharge via an existing channel below the high water mark at a location approximately 125m south east of Portmarnock Bridge as shown in Figure 1.



Figure 1 Photo showing location of proposed storm water outfall discharge

A storm water outfall for a previous project was proposed for this location and the planning authority requested that a scour study be undertaken to assess the impacts on the estuary. This was carried out by RPS and the firm has now been commissioned to update this study for the proposed revised storm water outfall discharge.

2.0 STUDY METHODOLOGY

2.1 General

RPS used their suite of coastal process models to simulate the changes in the flow regime in the upper part of the Baldoyle Estuary. The flows in the estuary were simulated both with and without the proposed storm water outfall in place so that the regime with the outfall in operation could be compared to the present day conditions. The combined flow and sediment transport models include the simulation of bed level change under the flow regime which was used to assess the risk of bed erosion resulting from the operation of the storm water outfall.

2.2 Computational Model

The Mike21 FM coupled flexible mesh flow and sediment transport model was used for the study. The extent of the model is shown in Figure 2. The model was driven at its seaward boundary by data taken from the RPS tidal and surge model of the Irish coastal waters and the Irish Sea.

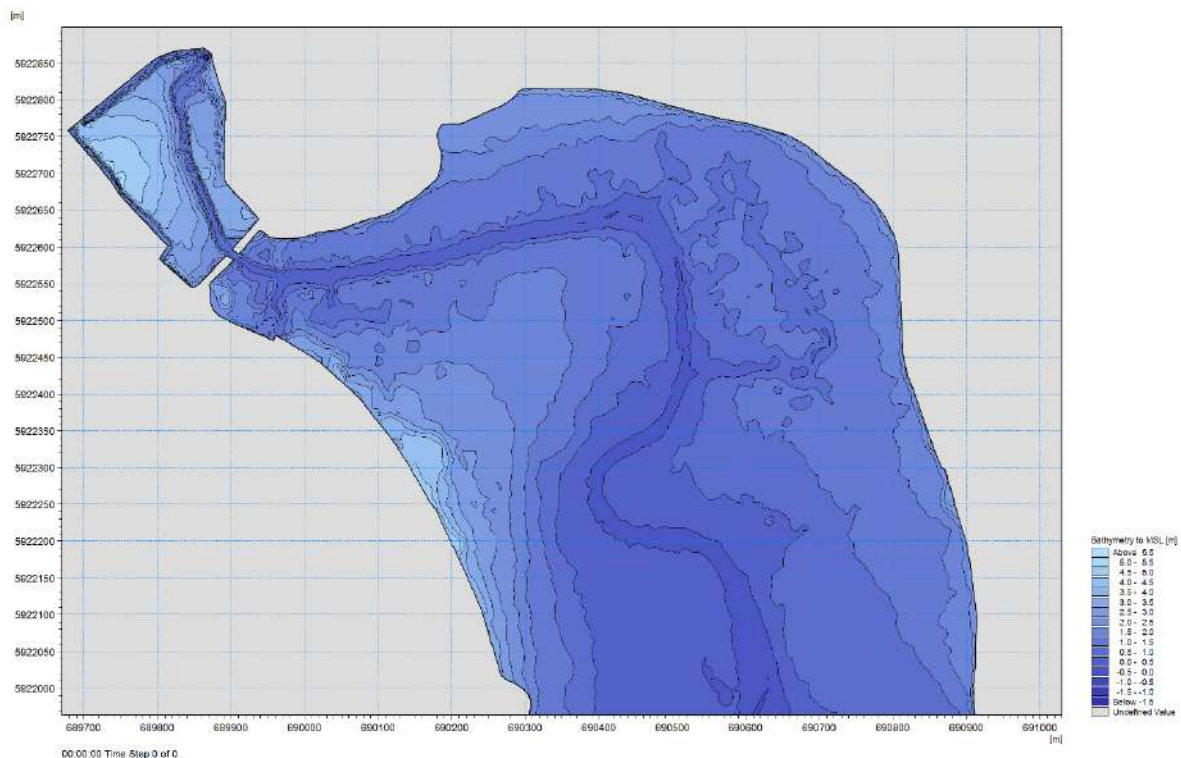


Figure 2 Extent of flexible mesh flow and sediment transport model

2.2.1 Bathymetry

The bathymetry for the model was taken from a variety of sources including LiDAR surveys, topographic surveys and local bathymetry surveys. The extent and resolution of the data sets is shown in the diagrams in Figure 3.

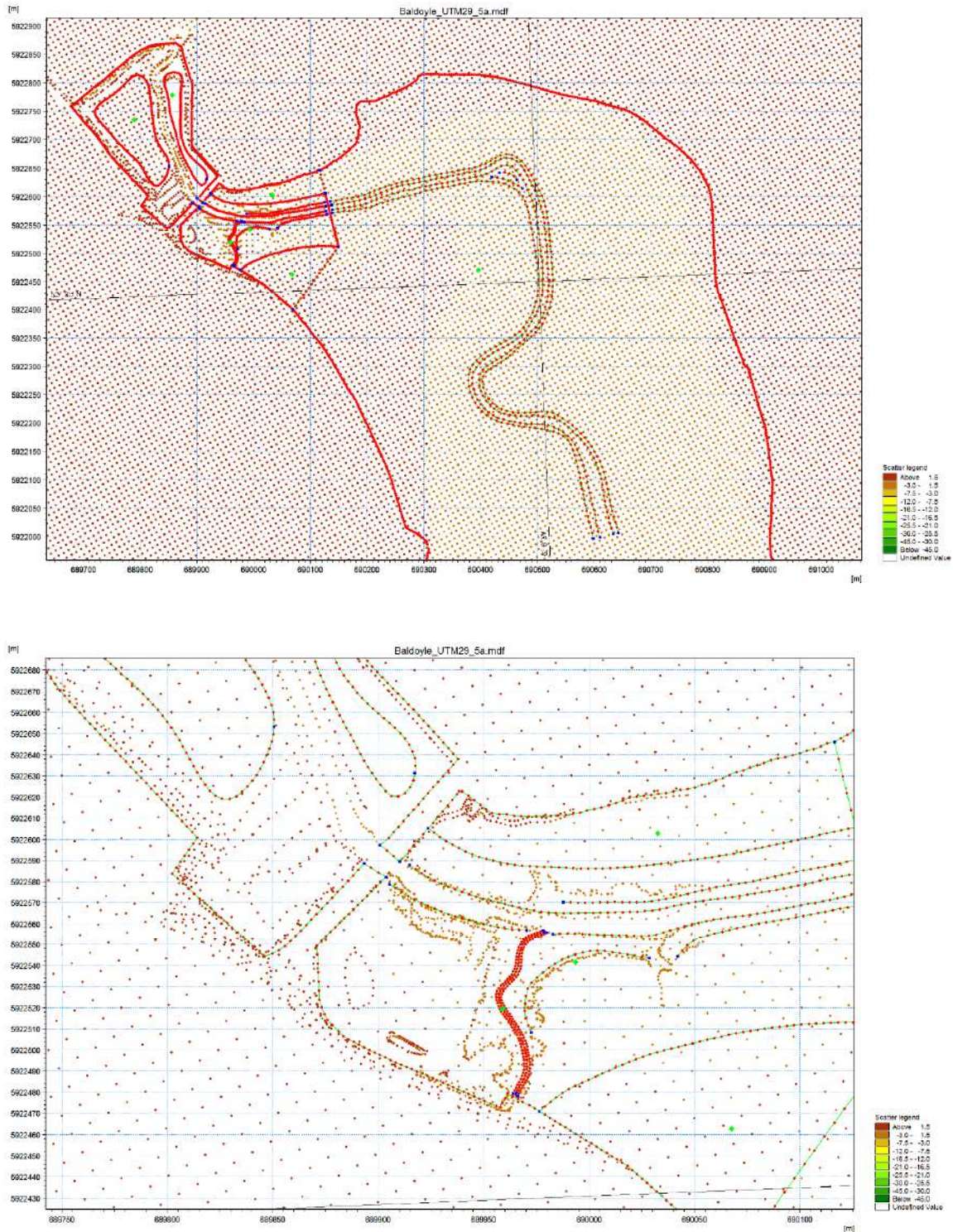


Figure 3 Extent and resolution of bathymetry data used in the model (overall extents and detail around discharge point shown in top and bottom diagram respectively)

2.2.2 Computational mesh

The coupled flow and sediment transport model was built with a flexible mesh grid system. The mesh resolution varied from 100m² in the outer parts of the model down to 10m² in the upper part of the estuary with a resolution of 2m² along the channel leading from the outfall discharge to the Sluice river channel. The overall model mesh is shown in in Figure 4 with the upper and lower diagrams showing the overall model mesh and detail in the proximity of the site respectively.

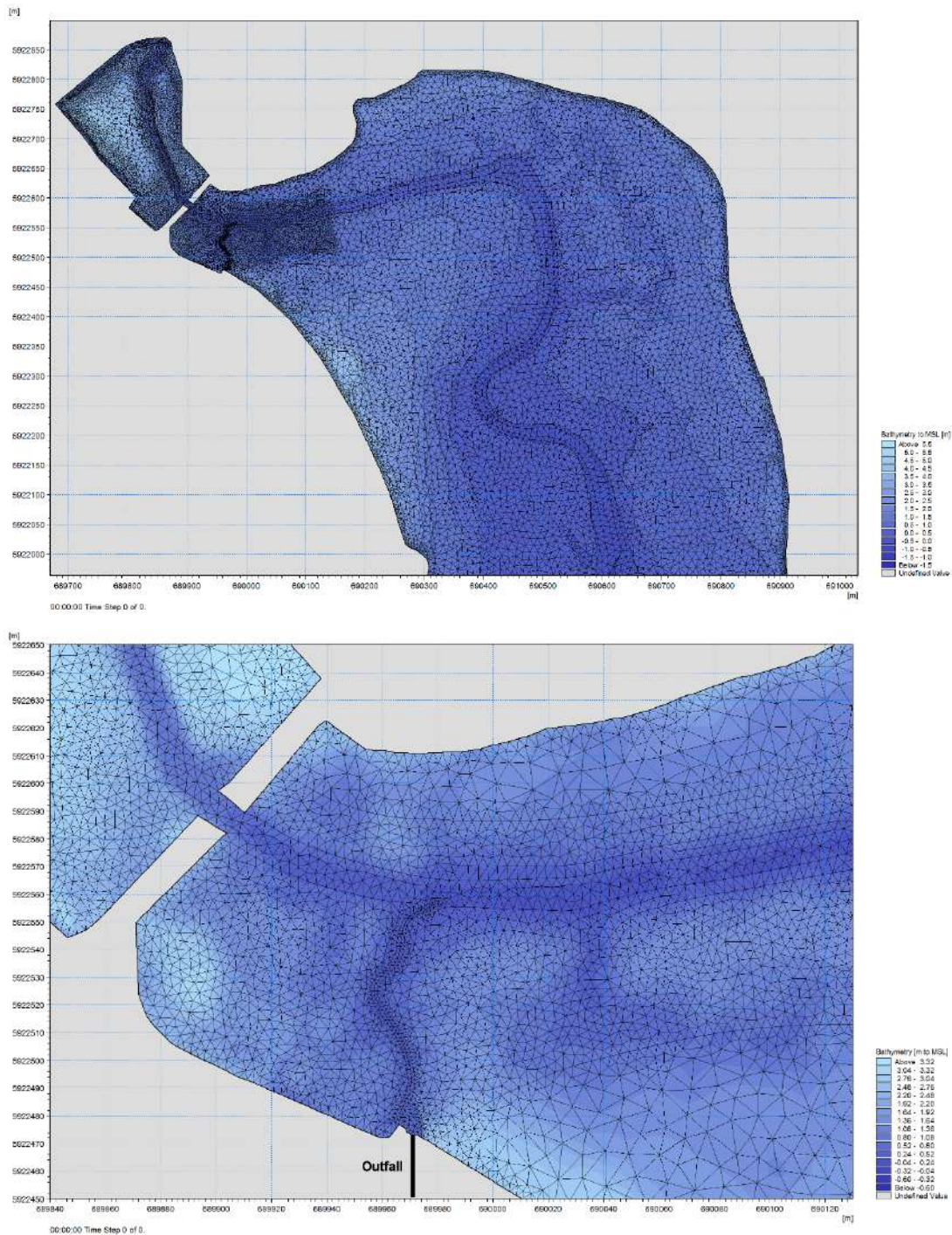


Figure 4 Mesh system used in computational model

2.2.3 Sediment data

The rate of sediment transport is governed by the flow velocity across the bed and the nature of the estuary bed sediments themselves. Samples of the bed sediments in the estuary channel leading from the proposed storm water outfall were taken as part of the previous outfall study. The location of the three pits is shown in Figure 5 and the particle size grading curves shown in Figure 6.

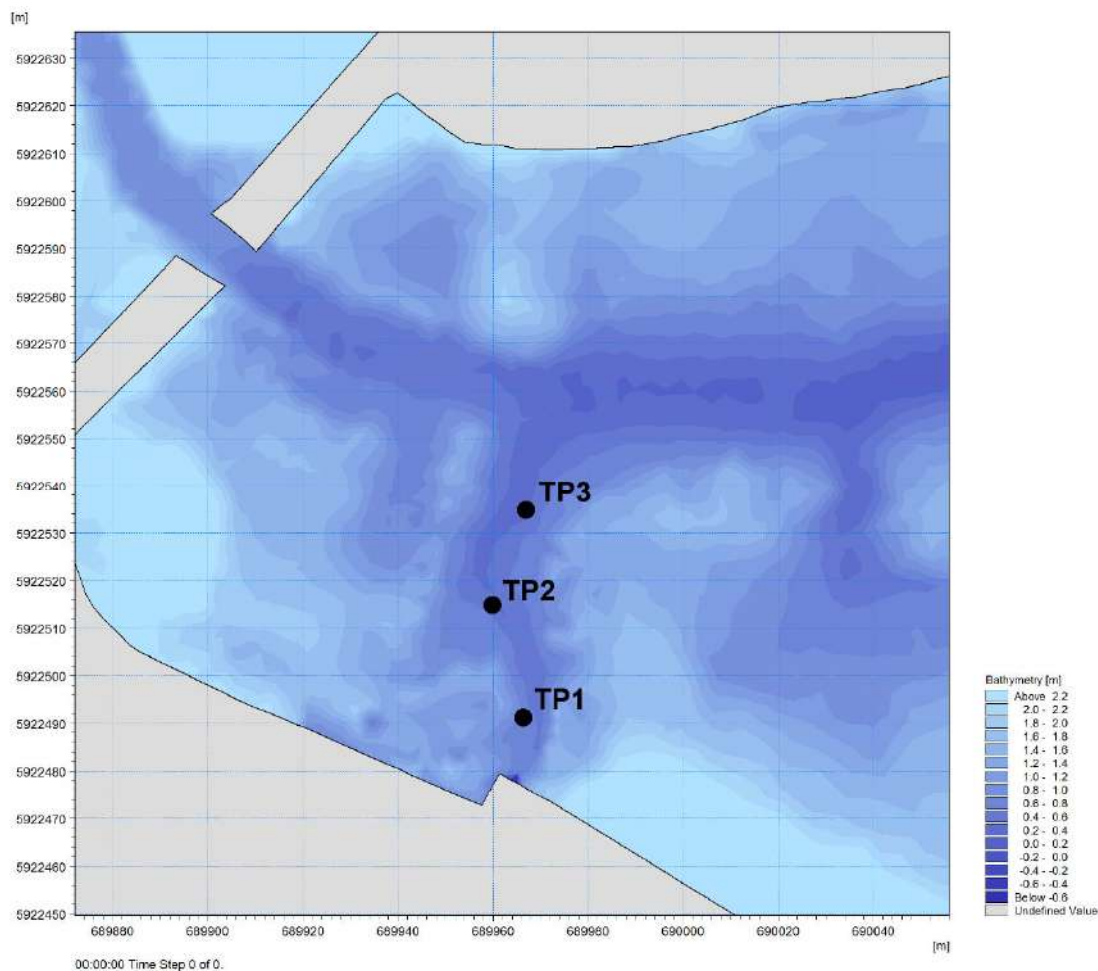
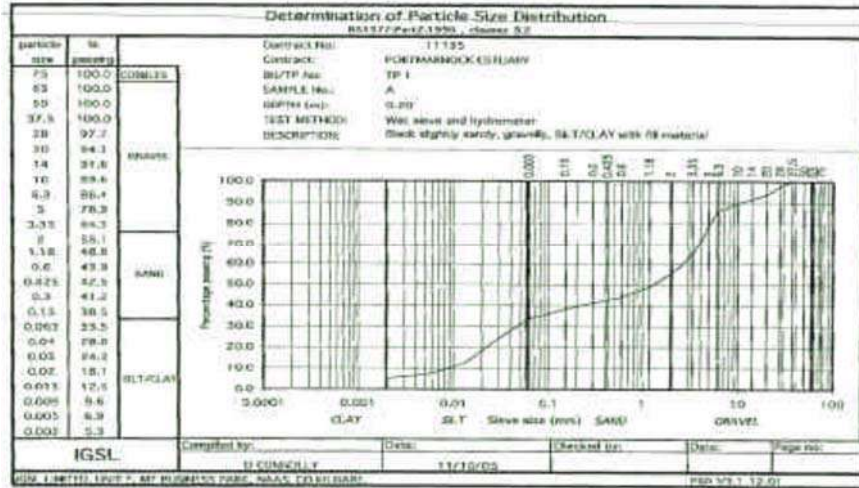
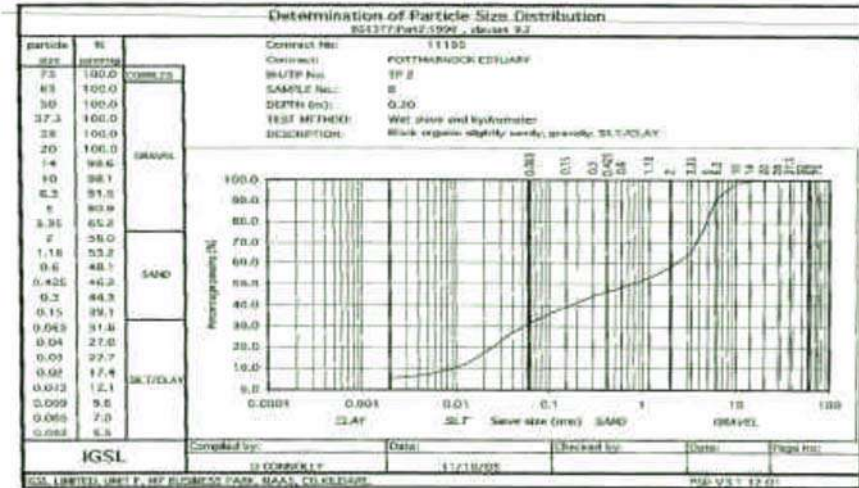


Figure 5 Location of sediment sampling pits in estuary channel.

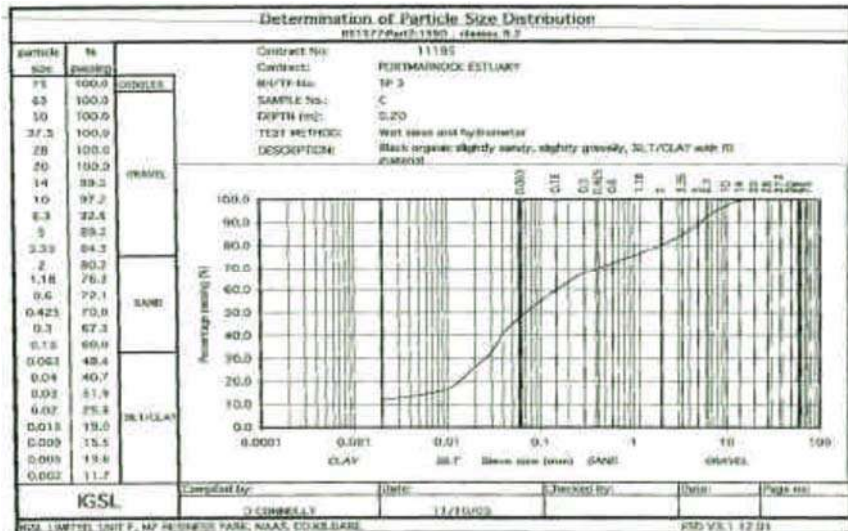
It will be seen from the grading curves in Figure 6 that the estuary bed sediments have a wide grading varying from fine silts to gravel sized material. Under high flows this type of bed sediment tends to “self armour” the surface as the finer fractions are initially carried away to leave the coarser fractions of the material in a layer on the surface which protects the material from further erosion. This process is already evident in Baldoyle Estuary where the surface of the river bed is composed of stony material while the embayments at the edges of the salt marsh have a muddy surface.



Particle Size Distribution – Sample Pit 1



Particle Size Distribution – Sample Pit 2



Particle Size Distribution – Sample Pit 3

Figure 6 Bed sediment particle size distributions

2.2.4 Fresh water flows

The storm water discharges from the proposed outfall have been supplied by J B Barry & Partners Ltd. The discharges and outlet current velocities area shown in Table 2.1 below. In the hydraulic modelling, to be conservative, the higher discharge rates and velocities associated with the high water level conditions were used in all the simulations.

Critical Storm Event	Discharge Conditions.	Pipe Flow (l/s.)	Velocity (m/s.)
1 YEAR	FREE DISCHARGE	145.2	0.67
1 YEAR	+3.70m. OD TIDE LEVEL	172.6	0.79
30 YEARS	FREE DISCHARGE	177.1	0.82
30 YEARS	+3.70m. OD TIDE LEVEL	184.8	0.85
100 YEARS	FREE DISCHARGE	190.5	0.88
100 YEARS	+3.70m. OD TIDE LEVEL	199.4	0.92

Table 2.1 Proposed outfall discharge conditions

In addition to the proposed outfall, fresh water flows into Baldoyle Estuary from the Sluice River. The catchment for this river is small at approximately 4.2 sq. km and there are no flow gauge records for this river. The freshwater flows in the river were therefore estimated using the Poots Cochrane formula for small catchments and by comparison of 10 years of daily gauge records from the nearby Ballyboghil River. The analysis of the flows for the various return period storm events yielded the following flows for the Sluice River at Baldoyle Estuary.

- 1 in 5 year return period storm 3.50 cumecs
- 1 in 30 year return period storm 4.75 cumecs
- 1 in 100 year return period storm 6.10 cumecs

In the computational model the fresh water inputs are included in the model by boundary source functions with specified flow rates and velocities.

2.3 Model Simulations

2.3.1 Flow Regime

As the flows from the proposed outfall are relatively small, it was decided to commence the model simulations using 1 in 100 year return period events and only examine lower return period events if the 1 in 100 year outfall discharge resulted in significant bed erosion. The simulations were undertaken with both the river and the outfall discharging at the storm peak conditions as it is likely that both sources will be subject to the same rainfall event. The model simulations were also run for the same events without the outfall discharge in place so that comparisons could be made with the existing flows in the estuary under storm conditions.

The combinations of extreme fluvial flows and high tidal levels has been studied during the CFRAM flood studies which have recently been completed for OPW. In the CFRAM studies it was considered that extreme 1 in 100 year return period fluvial events could be accompanied by high tidal events with a return period of 1 in 2 years. This combination of storm flows and high tidal water levels has been adopted for this study. Simulations were also undertaken with storm fluvial events and normal tidal levels to check that this combination was not more onerous for bed erosion than that with the extreme tidal conditions.

The flow model was run for 5 tidal cycles to ensure model stability with the tidal curve at the boundary derived from RPS Irish coastal waters and Irish Sea tidal and storm surge model. The 1 in 2 year return period tidal water level was taken from the results of the extreme tidal level analysis undertaken as part of the Irish Coastal Protection Strategy Study which was completed by RPS for the OPW. The extreme 1 in 2 year return period water level was 2.57 metres above MSL. The tidal curves used at the boundary of the upper Baldoyle Estuary model are shown in Figure 7.

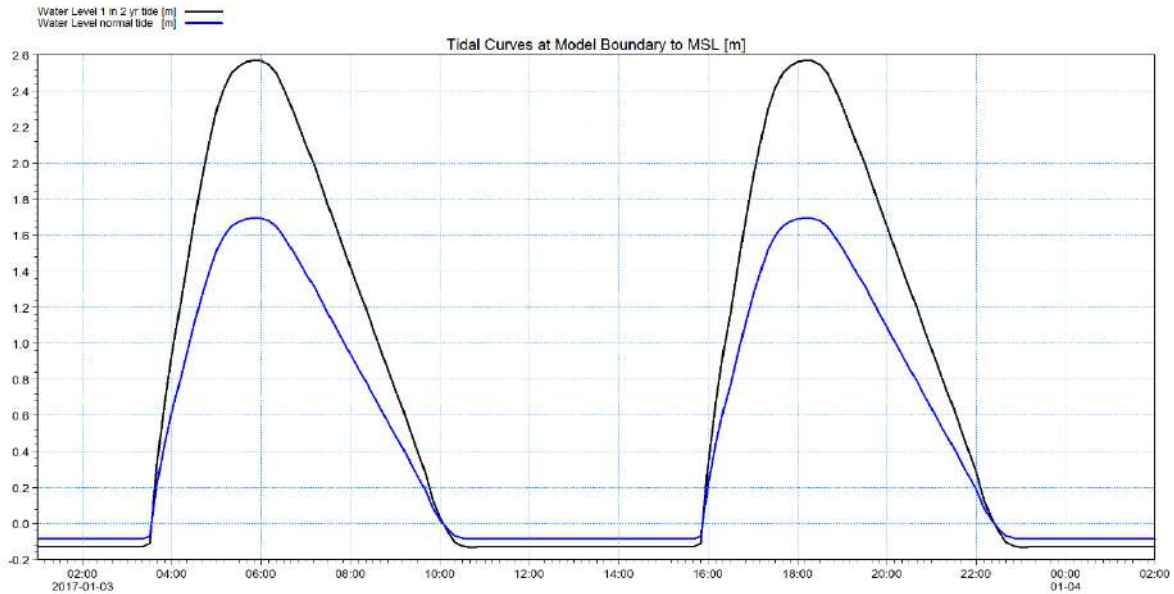


Figure 7 Tidal level profile at model boundary – extreme and normal tides

2.3.2 Sediment Transport

The sediment transport module, Mike21 FM ST uses currents from the hydrodynamic flow module together with bed sediment data to compute the sediment transport rate and then calculates the resulting change in the bed levels. The model allows the user to define areas of the model where the bed is not permitted to erode, e.g. where there is scour protection or the bed material is very coarse. As the study is concerned with possible erosion due to the effect of the storm water outfall discharge, areas of the model which are not affected by the discharge (e.g. areas upstream of the bridge) have been stabilized by including a minimum bed thickness map.

The sediment transport and bed level change was modelled over the complete tidal cycle using 1 in 100 year return period storm flows with both the extreme and normal tidal level profiles. Simulations were undertaken for bed sediment grain sizes of 5mm, 1mm and 0.1mm so that the impact of surface armouring could be correctly assessed from the model results. The bed level change was assessed in terms of the value that occurred at end of a tidal cycle simulation for each of the sediment grain sizes.

3.0 RESULTS OF THE MODEL SIMULATIONS

3.1 Flow Regime

3.1.1 1 in 100 year return period fluvial storm with 1 in 2 year return period tide

The results of the simulations are shown in terms of peak current speeds for the model with the storm water overflow in place in Figure 8 and for the model without the storm water overflow in Figure 9. As it is difficult to see the difference between the current regimes in these diagrams, a difference plot (current speeds with the outfall discharge in place minus the current speeds without the outfall discharge) is also shown in Figure 10.

As will be seen from these Figures 8, 9 and 10 the impact of the outfall discharge only has a noticeable effect in the area of the small channel leading from the outfall to the main river channel. Even then the velocities in the channel beyond the end of the concrete apron are generally only increased by less than 0.08 m/s due to the effect of the proposed outfall discharge. This is a very small increase in current speed.

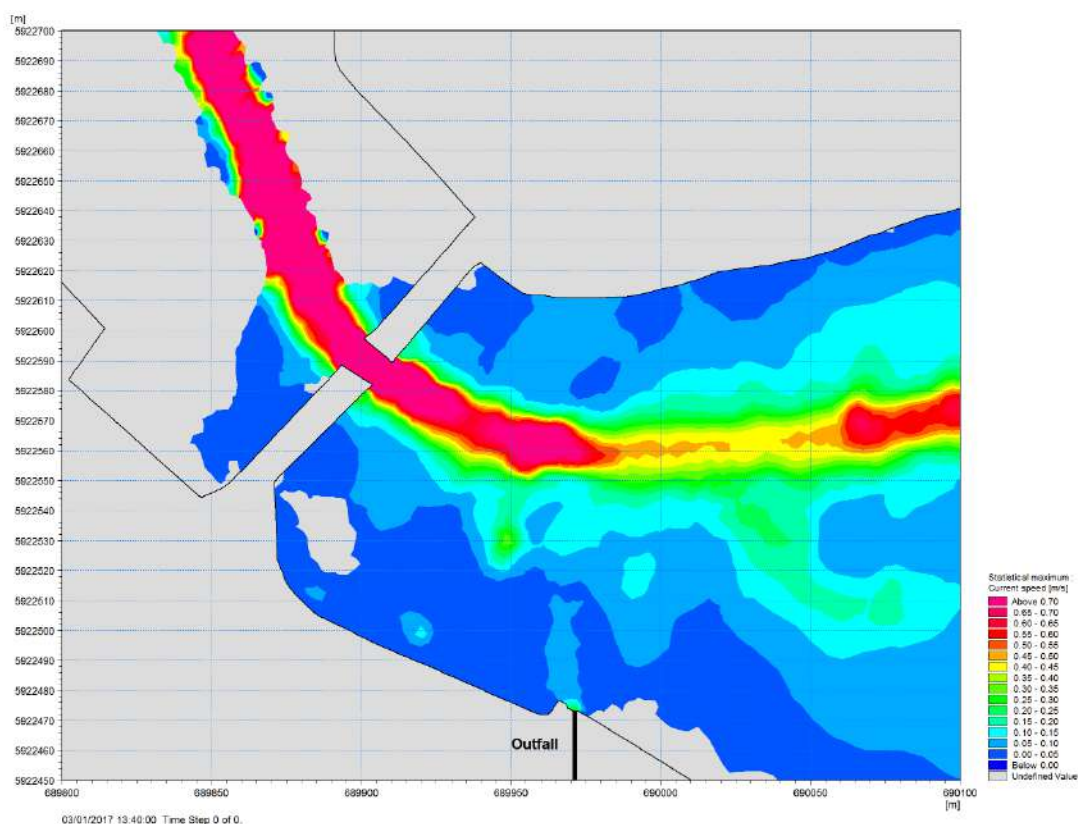


Figure 8 Peak current speed with the proposed outfall in place

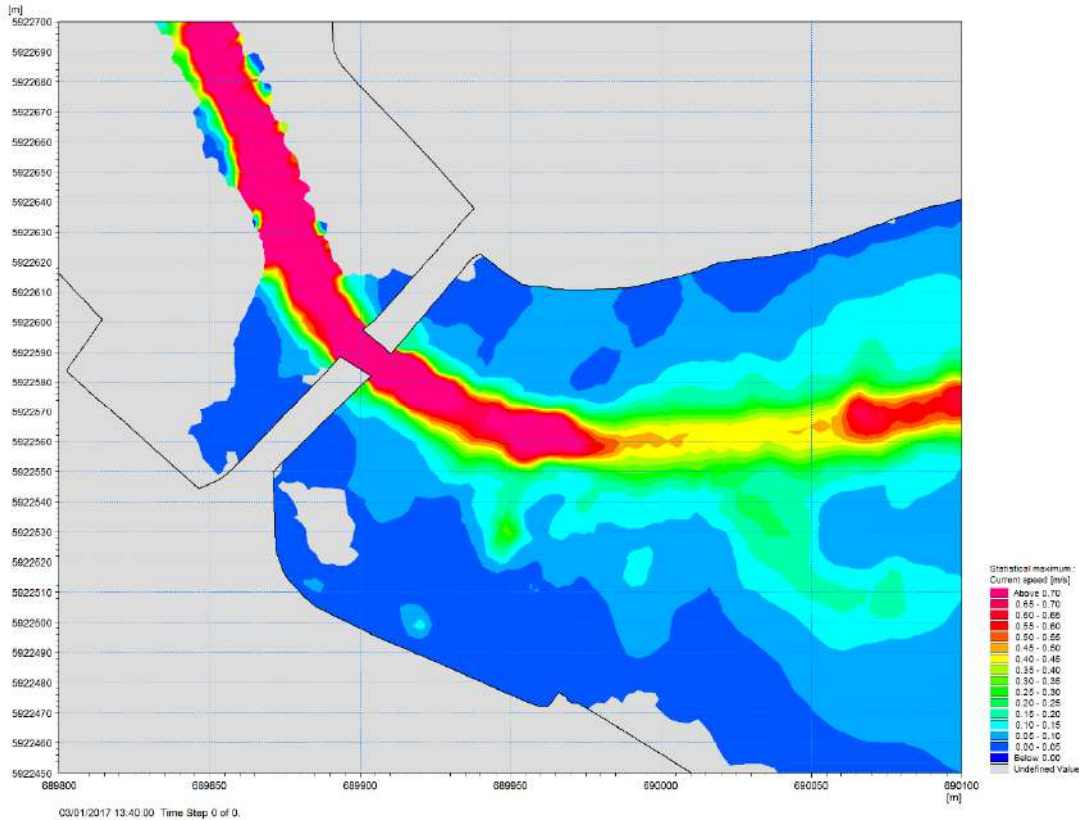


Figure 9 Peak current speed with no outfall discharge

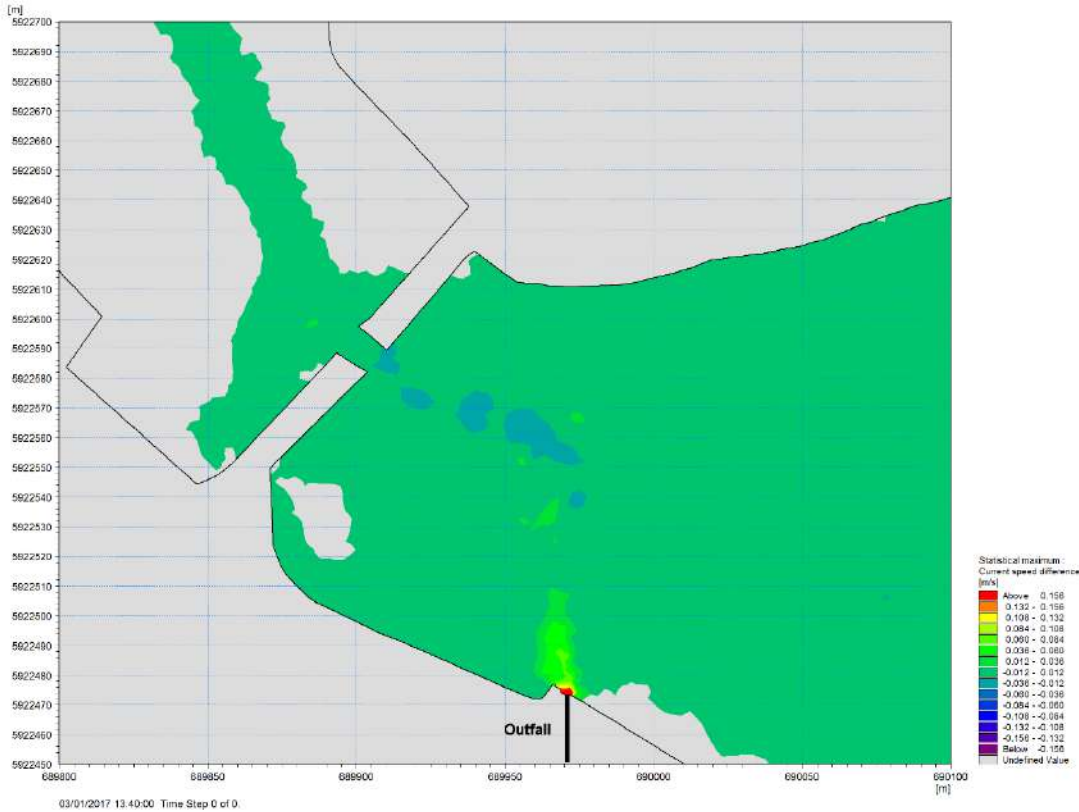


Figure 10 Peak current speed difference (with outfall minus without outfall)

3.1.2 1 in 100 year return period fluvial storm with average spring tide

As a check to see if a less extreme tidal regime would significantly change the peak current values around the proposed outfall area, simulations for the 100 year return period fluvial event were run with an average spring tide. The results of the simulations are shown in terms of peak current speeds for the model with the storm water overflow in place in Figure 11 and for the model without the storm water overflow in Figure 12. In order to see the difference between the current regimes in these diagrams, a difference plot (current speeds with the outfall discharge in place minus the current speeds without the outfall discharge) is also shown in Figure 13.

As with the simulation for the 1 in 2 year return period tide, it will be seen from the peak velocity figures and in particular from the difference plot, in Figure 13, that the impact of the outfall discharge is mainly confined to the area of the small channel leading from the outfall to the main river channel. Even then the velocities in this channel beyond the end of the concrete apron are generally only increased by less than 0.08 m/s due to the effect of the proposed outfall discharge. This is a very small increase in current speed.

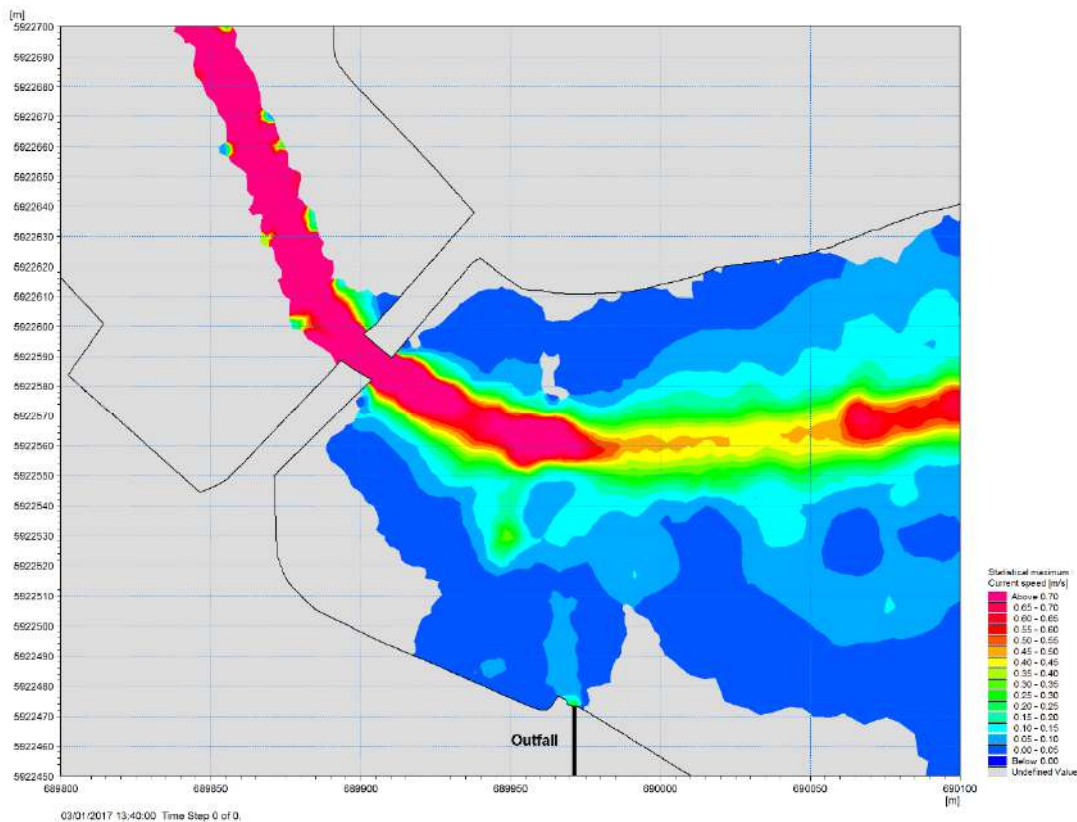


Figure 11 Peak current speed with the proposed outfall in place

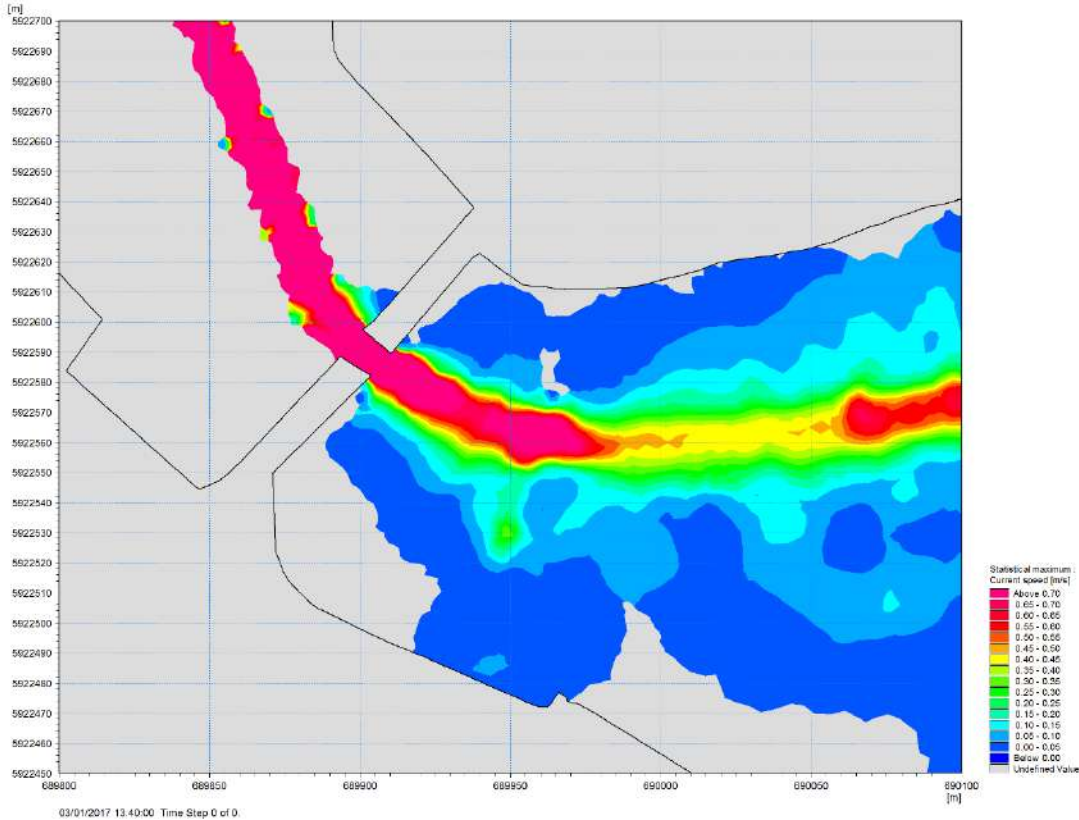


Figure 12 Peak current speed with no outfall discharge

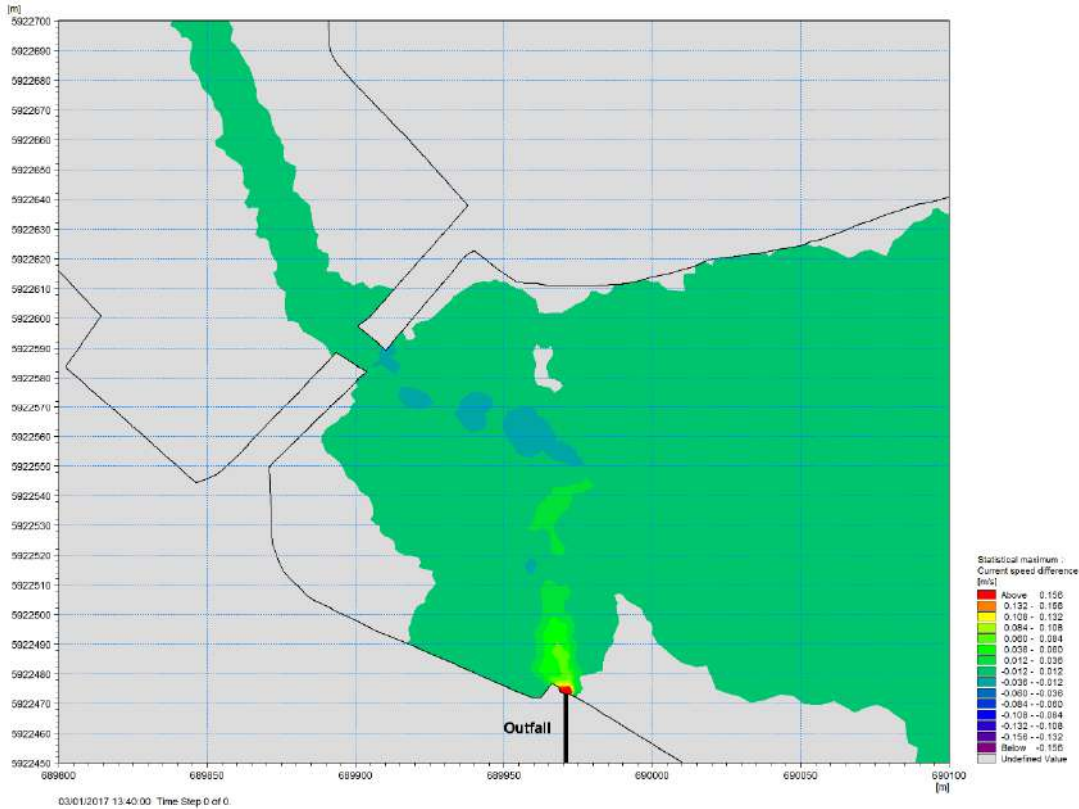


Figure 13 Peak current speed difference (with outfall minus without outfall)

3.2 Sediment Transport and Bed Erosion

3.2.1 1 in 100 year return period fluvial storm with 1 in 2 year return period tide

The sediment transport module includes the predicted bed level change in response to the flow regime. The predicted difference in the change in the bed levels over a tidal cycle (with minus without the outfall discharge in place) are shown in Figures 14, 15 and 16 for 5mm, 1mm and 0.1mm bed sediment grain size respectively.

It will be seen from these diagrams that there is no effect of the proposed outfall on the estuary bed levels as a result of 1 in 100 year return period storm water discharge during a 1 in 2 year return period tidal event. This result is not unexpected as the difference in the tidal currents resulting from the proposed outfall discharge is very small.

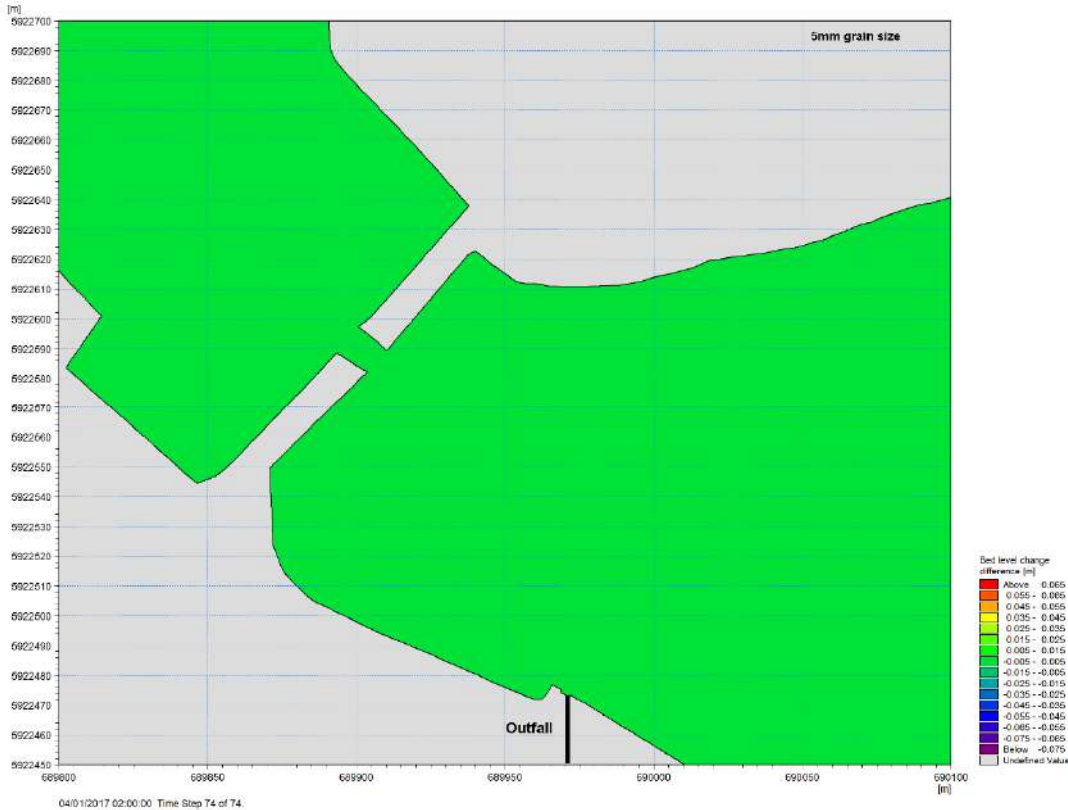


Figure 14 Bed level change difference - 5mm bed sediment grain size

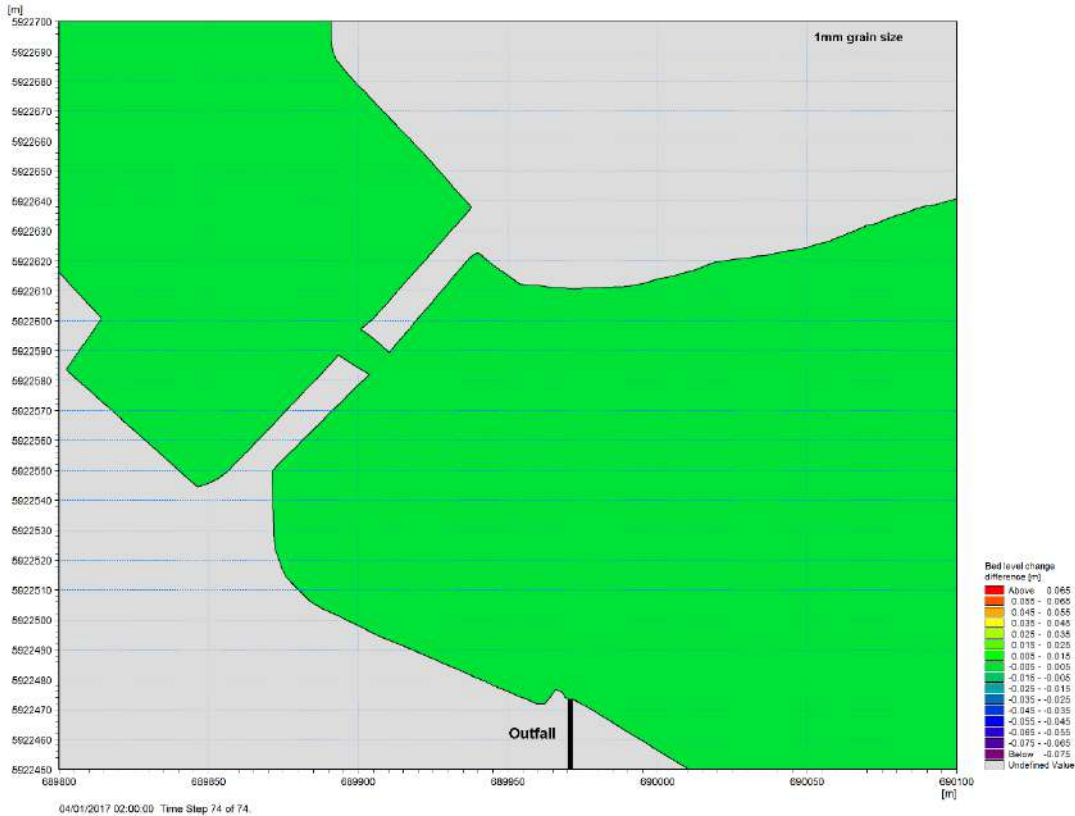


Figure 15 Bed level change difference - 1mm bed sediment grain size

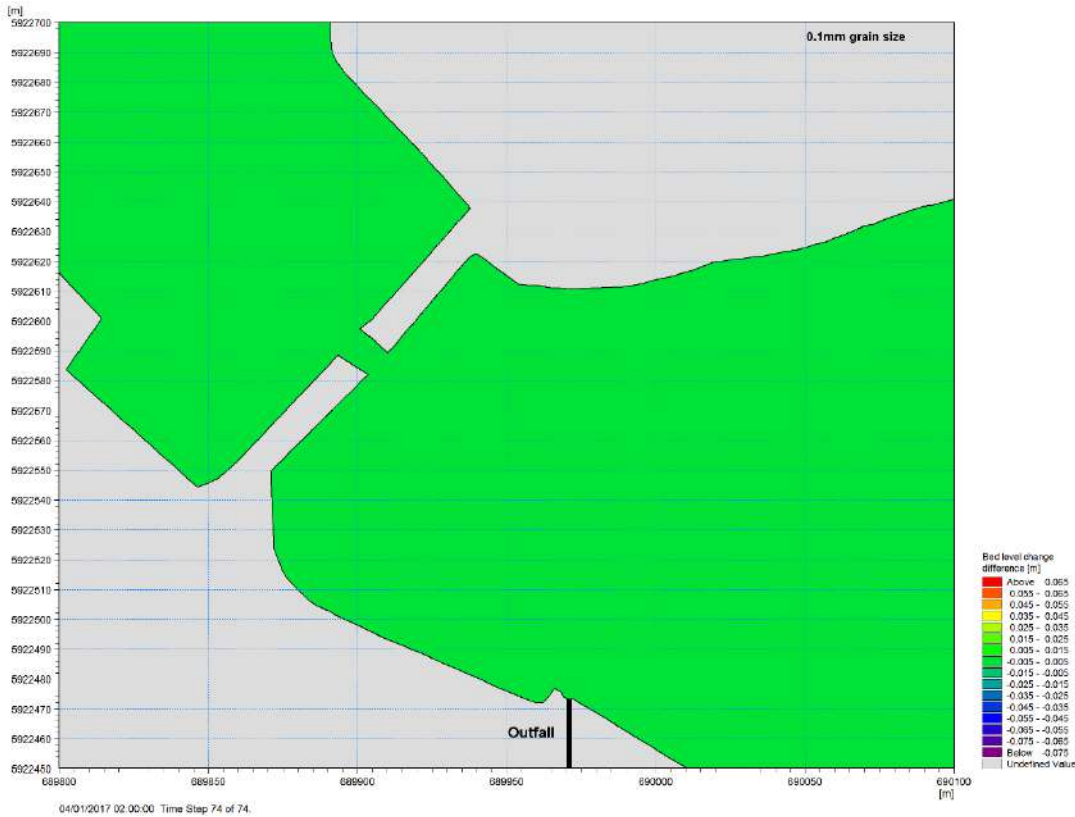


Figure 16 Bed level change difference – 0.1mm bed sediment grain size

3.2.2 1 in 100 year return period fluvial storm with average spring tide

Similarly to the 1 in100 year return period fluvial event with the 1 in 2 year return period tide, the tidal velocity differences between the estuary with and without the outfall discharge for the 1 in 100 year return period event with an average spring tide are very small. Thus it is no surprise that as shown in Figure 17, there is no difference in the change bed levels for the estuary with or without the proposed storm water outfall discharge. Figure 17 shows the bed level change difference for the simulation using 1mm bed sediment grain size. Similar effects were found with both the 5mm and the 0.1mm grain sized bed sediments.

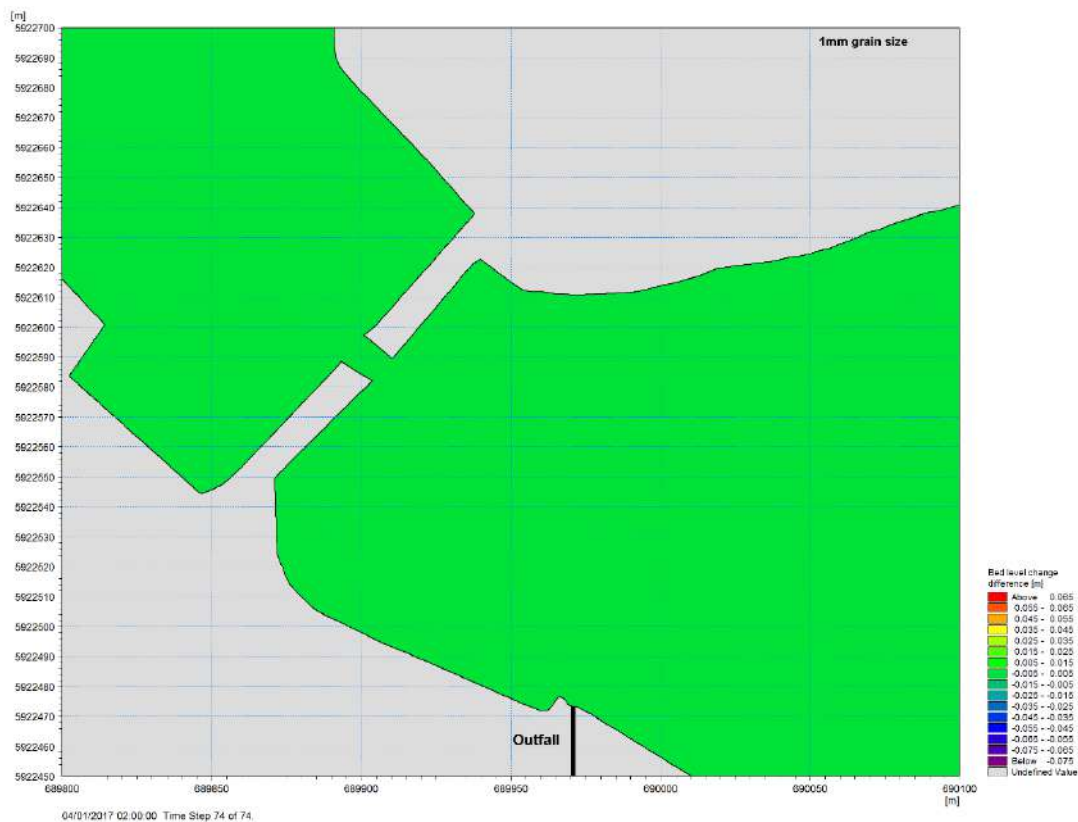


Figure 17 Bed level change difference - 1mm bed sediment grain size

4.0 CONCLUSIONS

The computational model studies have shown that any increase in the flow velocities due to the proposed storm water outfall discharge are restricted to the channel leading from the proposed outfall to the River Sluice channel. The increase in the flow velocities away from the immediate area of the outfall structure itself will be less than 0.08 m/s even during a 1 in 100 year return period storm event. Thus the proposed storm water outfall will have no significant impact on the overall flow regime of the Baldoyle Estuary.

Modelling of the changes in the sediment transport regime resulting from the operation of the proposed storm water outfall indicate that there will be no significant bed erosion in the estuary channels as a result of storm water discharge for return periods of up to and including 1 in 100 years. Thus the proposed storm water outfall is not expected to have any significant impact on the overall sediment transport regime of the estuary.

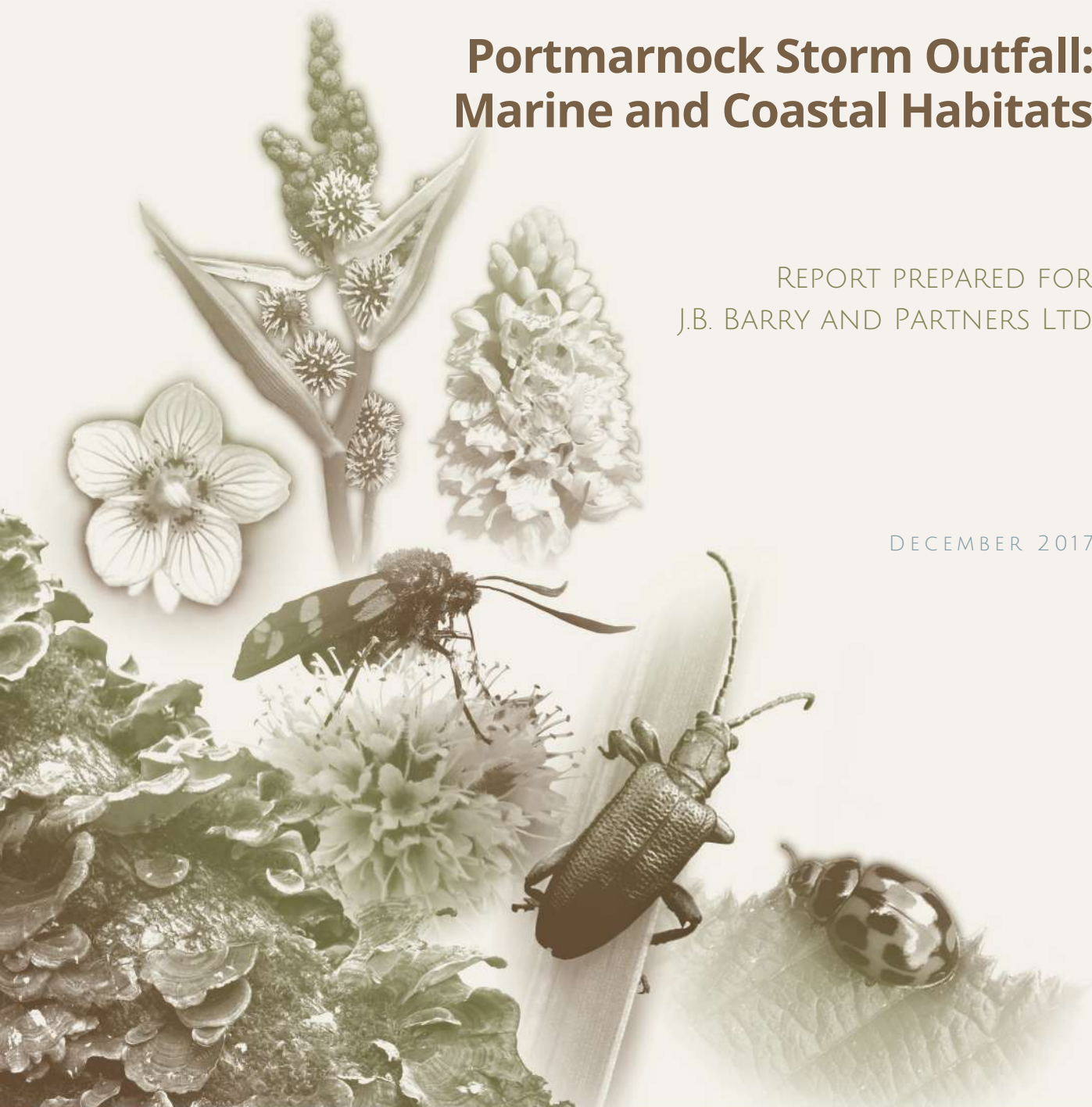
The results of the study which confirm that there will not be a significant impact on the hydraulic or sedimentation regime of the estuary from the proposed storm water discharge is consistent with the fact that the storm river flows in the Baldoyle Estuary are more than 30 times larger than the proposed storm water outfall discharge.

Appendix 3 – Portmarnock Storm Outfall: Marine and Coastal Habitats (BEC Ltd)

Portmarnock Storm Outfall: Marine and Coastal Habitats

REPORT PREPARED FOR
J.B. BARRY AND PARTNERS LTD

DECEMBER 2017



Portmarnock Storm Outfall: Marine and Coastal Habitats

December 2017



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1 Introduction

BEC Consultants Ltd was contracted by J.B. Barry and Partners Ltd to carry out a marine and coastal habitat survey of the northern section of Baldoyle Bay, Portmarnock, Co. Dublin, to inform a foreshore licence application in relation to a proposed storm water outfall servicing proposed development lands to the south. In addition to describing the habitats present and the infauna (animals living within the sediment) inhabiting the mudflats, an impact assessment was carried out in relation to the proposed storm water outfall.

The proposed storm water outfall will enter the estuary adjacent to an existing culvert (Appendix I, Figure A1).

2 Study area

The study area was the northern section of Baydoyle Bay, with the proposed outfall to enter the bay adjacent to an existing culvert approximately 120 m southeast of Portmarnock Bridge, Portmarnock Co. Dublin.

3 Methodology

The survey consisted of a survey of saltmarsh habitat and marine/estuarine habitats and was carried out during low water on the 9th September 2016 by John Brophy and Dr Fionnuala O'Neill of BEC Consultants Ltd. The saltmarsh survey consisted of a walk through the site, recording plant species, and mapping any habitat transitions. General structural characteristics of the saltmarsh, such as creeks/pans or vegetation zonation, as well as any impacts affecting ecological condition, were also noted.

The marine/estuarine habitats were surveyed by mapping biotopes in the field and also carrying out sediment core sampling at four locations. A 0.01 m² stainless steel core was used to take three replicate samples to a depth of 15 cm at each of the four sample locations. Replicates were placed in sealable plastic bags and labelled before being returned to the laboratory for processing. Each sample was sieved using a 0.5 mm sieve and fixed in Formalin. The sample was treated with Rose Bengal to facilitate sorting before being transferred to 70% Industrial Methylated Spirits (IMS) for preservation prior to sorting. Sorting of samples was carried out in white trays, with infauna transferred to sample jars for identification and enumeration.

Based on the results of the infaunal analysis, the biotope was identified using Connor *et al.* (2004).

The primary aim of the survey was to determine if EU Annex I habitats were present at the proposed outfall location.

4 Existing environment

4.1 General

Baldoyle Bay is located on the east coast of Ireland in north County Dublin. The bay is created by a sand spit supporting sand dunes. The Sluice River flows into the bay at its northern extent, with the Mayne River inflowing further south. The bay includes large expanses of mudflat, sandflat and saltmarsh, supporting marine species and waterfowl.

Baldoyle Bay is a Special Area of Conservation (SAC; site code: 000199) under the Habitats Directive (92/43/EEC), which is transposed into Irish legislation by the European Communities (Birds and Natural Habitats Regulations, 2011 – S.I. 477/2011), and is designated for the presence of the following Annex I habitats (NPWS, 2012):

- 1140 Mudflats and sandflats not covered by seawater at low tide
- 1310 Salicornia and other annuals colonizing mud and sand
- 1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)
- 1410 Mediterranean salt meadows (*Juncetalia maritimi*)

Baldoyle Bay is also a Special Protection Area (SPA; site code: 004016) under the Birds Directive (2009/147/EC), which is transposed into Irish legislation by the European Communities (Birds and Natural Habitats Regulations, 2011 – S.I. 477/2011), and is designated for the following bird species, as well as the general category Wetland and Waterbirds [A999] (NPWS, 2013):

- Light-bellied Brent Goose (*Branta bernicla hrota*) [A046]
- Shelduck (*Tadorna tadorna*) [A048]
- Ringed Plover (*Charadrius hiaticula*) [A137]
- Golden Plover (*Pluvialis apricaria*) [A140]
- Grey Plover (*Pluvialis squatarola*) [A141]
- Bar-tailed Godwit (*Limosa lapponica*) [A157]

4.2 Saltmarsh

Two Annex I saltmarsh habitats were recorded from the surveyed area:

- 1330 Atlantic salt meadows
- 1410 Mediterranean salt meadows

The habitats are illustrated in Appendix I, Figure A1. All plant names are according to Preston *et al.* (2002).

4.2.1 1330 Atlantic salt meadows

This was the main Annex I saltmarsh habitat recorded. It is recognised that 1330 Atlantic salt meadows are composed of a range of different plant communities (Devaney & Perrin, 2013). In this site, the majority of 1330 habitat consisted of Sea-purslane (*Atriplex portulacoides*) swathes, which became particularly dense closer to the mudflats. Common Saltmarsh-grass (*Puccinellia maritima*) was found growing among the Sea-purslane. This habitat was classified under the Heritage Council habitat classification of Fossitt (2000) as CM1 Lower Salt Marsh.

Areas of 1330 Atlantic salt meadows that consist of a more herbaceous sward of Thrift (*Armeria maritima*), Sea Plantain (*Plantago maritima*), Sea Arrowgrass (*Triglochin maritimum*) and Sea Aster (*Aster tripolium*) were found, most of it east of the stream/outlet. Long-bracted Sedge (*Carex extensa*) was recorded here. This habitat was also classified under Fossitt (2000) as CM1 Lower Salt Marsh.

A less extensive type of 1330 Atlantic salt meadows consisted of upper salt marsh vegetation (classified under Fossitt (2000) as CM2 Upper Salt Marsh) with a high cover of Saltmarsh Rush (*Juncus gerardii*) and Red Fescue (*Festuca rubra*). Other typical saltmarsh species such as Sea-

milkwort (*Glaux maritima*), Common Scurvygrass (*Cochlearia officinalis*), Sea Arrowgrass and Sea Aster were also recorded here.

Intermediates between the three types were found to occur, particularly in the western half of the survey area, with Lax-flowered Sea-lavender (*Limonium humile*) occasional in some of these areas.

Evidence of the site being used by roosting birds was seen as a concentration of bird droppings and feathers where the 1330 habitat extends as a narrow spit through the mudflat northwards to the end of the sluice wall.

4.2.2 1410 Mediterranean salt meadows

This Annex I habitat was recorded at the eastern periphery of the area surveyed, characterised by the presence of Sea Rush (*Juncus maritimus*), an upper salt marsh species.

4.2.3 Non-Annex habitats

Areas were also recorded that did not conform to an Annex I habitat. These occurred primarily adjacent to the road, on the seaward side of the boundary wall. The main species recorded were Common Couch (*Elytrigia repens*), False Oat-grass (*Arrhenatherum elatius*), Perennial Sow-thistle (*Sonchus arvensis*), Large Bindweed (*Calystegia silvatica*), Field Bindweed (*Convolvulus arvensis*), Common Nettle (*Urtica dioica*) and Brambles (*Rubus fruticosus* agg). Sea Beet (*Beta vulgaris* ssp. *maritima*) and Sea Mayweed (*Tripleurospermum maritimum*) were occasional. Much of this habitat appears to have been disturbed in the past and often occurs on ridges within the site which may have arisen from previous earthworks.

4.2.4 Invasive species

Invasive species can transform ecosystems and threaten native habitats and species (Kelly *et al.* 2013). Regulations 49 and 50 of S.I. 477/2011, the European Communities (Birds and Natural Habitats) Regulations 2011, provide the legislative framework for invasive species within the State. Many invasive species originate outside Ireland and are considered to be non-native, i.e., alien species; however, some of the animals listed within S.I. 477/2011 are native. Species listed on the Third Schedule of S.I. 477/2011 are the only species where there is a legal imperative to ensure that they are not transported or spread as a consequence of the proposed project.

Common Cord-grass (*Spartina anglica*) is the invasive species of most concern that was recorded at the site, as it is listed on the Third Schedule of S.I. 477/2011. To the east of the stream/outlet the 1330 habitat was prone to Common Cord-grass invasion, with many areas covered by more than 40% of Common Cord-grass. The degree of invasion was far lower on the western side, except for the area near the sluice gate to the northwest, where Common Cord-grass was becoming established on bare mud beside the river.

Japanese Knotweed (*Fallopia japonica*) was recorded in a single location some distance southeast of the proposed work site (Appendix I, Figure A1). This species is listed on the Third Schedule of S.I. 477/2011. The area of Japanese Knotweed has been treated with herbicide by Fingal County Council, leaving only dead standing stems, and was showing no sign of regrowth.

Large Bindweed is also invasive, particularly in disturbed ground, which is where it occurs on this site. However, it is not listed the Third Schedule of S.I. 477/2011. Neither was it found on the Annex I saltmarsh. It is therefore not expected to become a problem on the saltmarsh habitats on this site, provided these remain undisturbed.

4.2.5 Condition of the Annex I saltmarsh habitat 1330 Atlantic salt meadows on site:

McCorry & Ryle (2009) devised criteria to assess the condition of Annex I saltmarsh habitats in Ireland. While it is not the primary aim of this survey to carry out a full condition assessment of the Annex I habitats, it is nevertheless useful to examine the site with these criteria in mind, to assess the quality and overall ecological condition of the saltmarsh habitat at Portmarnock. As 1330 Atlantic salt meadow is the only habitat present at the development location, only this habitat was assessed.

- **Physical structure: creeks and pans**

The target is for there to be no further human alteration of creek function (e.g. drainage). Creeks were present through the site, particularly between the Sea-purslane vegetation, and these did not appear to have been modified by drainage or other anthropogenic influences.

- **Vegetation structure: zonation**

The target is to maintain a range of plant zonation typical of the site. A range of plant communities occur across the site, all typical for the type of saltmarsh present here (lower-middle-upper marsh, no pioneer communities), including communities which are transitional between different types of the 1330 habitat.

- **Vegetation structure: sward height**

The target is to maintain site-specific structural variation in the sward. A guideline is to maintain a 25%:75% ratio of tall/short sward height through the whole saltmarsh (McCorry & Ryle, 2009). There was adequate variation in sward height throughout the saltmarsh, with taller Sea-purslane alternating with shorter Thrift/Sea Plantain swards.

- **Vegetation composition: characteristic species**

All of the typical saltmarsh species were found on site, with vegetation composition varying appropriately in the different zones and vegetation communities present.

- **Indicators of negative trend (Common Cord-grass)**

As noted above, this is the greatest impact on the site, with some areas of 1330 habitat having more than 40% cover of Common Cord-grass. The target is for there to be no evidence of recent expansion of Common Cord-grass into saltmarsh during any 6-year monitoring period. This should be borne in mind if the proposed works go ahead.

- **Other negative indicators**

No evidence of other negative impacts, such as dumping, trampling or vehicle use, was noted during the survey. Boundary walls around part of the site present a barrier to landward saltmarsh expansion, introducing the possibility of coastal squeeze becoming an issue if sea levels rise, but further repeated site visits would be necessary to ascertain if this is occurring at this site.

Overall conclusion on the condition of the site:

The Annex I saltmarsh habitat 1330 Atlantic salt meadows at this site appears to be in good condition, with a typical suite of species, habitat heterogeneity and structural diversity. The main impact is from Common Cord-grass invasion, with stone and concrete boundary walls also allowing the potential for coastal squeeze to become an issue in the future, should sea levels rise.

4.3 Mudflats

The marine Annex I habitat 1140 Mudflats and sandflats is the main habitat present in Baldoyle Bay SAC and is found within the proposed development area (Appendix I, Figure A1). As well as being a qualifying interest for the SAC itself, the flora and fauna of the mudflats and sandflats provide foraging for the waterfowl utilising the SPA.

4.3.1 Invertebrates

Sediment core sampling for marine invertebrates was carried out at four locations on the mudflats in the vicinity of the proposed storm outfall (Appendix I, Figure A1, Appendix II, Table A1). A total of eight species were recorded from the samples taken, with the number of species per sample ranging from two to five (Table 1). The ragworm *Hediste diversicolor* was recorded at all sites and in all replicates. The worm *Tubificoides benedii* and the bivalve *Scrobicularia plana* were recorded at all locations, but not in all replicates. Other species were occasionally present and in low numbers.

Table 1: Results of the intertidal marine invertebrate survey in Baldoyle Bay

SPECIES	SAMPLE STATION	S01			S02			S03			S04		
	Replicate	S01a	S01b	S01c	S02a	S02b	S02c	S03a	S03b	S03c	S04a	S04b	S04c
Oligochaeta													
<i>Tubificoides benedii</i>		29	14	20	1	2	-	8	1	-	6	1	1
Polychaeta													
<i>Hediste diversicolor</i>		18	10	22	7	7	7	15	11	9	8	13	8
<i>Eteone longa</i>		1	-	-	-	-	-	-	-	-	-	1	-
<i>Glycera tridactyla</i>		-	1	-	-	-	-	-	-	-	-	-	-
<i>Nephtys</i> sp.		-	-	-	-	-	-	-	-	-	1	-	-
Mollusca													
<i>Scrobicularia plana</i>		2	1	-	3	1	1	1	2	1	2	3	1
<i>Macoma balthica</i>		-	1	-	2	4	2	-	-	-	-	1	1
Crustacea													
<i>Carcinus maenas</i>		-	-	1	-	-	-	-	-	-	-	-	-
No. of species		4	5	3	4	4	3	3	3	2	4	5	4
No. of individuals		50	27	43	13	14	10	24	14	10	17	19	11

4.3.2 Biotopes

Based on the species and substratum present, two marine biotopes were identified within the study area: *Hediste diversicolor*, *Macoma balthica* and *Scrobicularia plana* in littoral sandy mud (LS.LMu.MEst.HedMacScr) and *Fucus ceranoides* on reduced salinity eulittoral rock (LR.LLR.FVS.Fcer) (Connor *et al.*, 2004). The soft-sediment biotope dominates the area, with the *Fucus ceranoides* habitat is largely restricted to the historical retaining walls either side of the Sluice River channel and rocks fallen from them.

The biotope LS.LMu.MEst.HedMacScr corresponds to the Annex I habitat Mudflats and sandflats and is therefore a qualifying interest for Baldoyle Bay SAC.

5 Potential impacts

5.1 Habitat loss & disturbance

The construction of the proposed storm outfall will result in the permanent loss marginal, roadside non-annex habitat that is of low ecological value. No Annex I habitat will be lost or disturbed due to the construction and operation of the proposed outfall due to its location and design.

5.2 Pollution & suspended solids

The operation of plant and machinery has the potential to cause pollution of soils and surface waters through accidental leaks. Hydrocarbons have toxic lethal and sub-lethal effects, which impact on aquatic species.

Construction works have the potential to create suspended solids, which will settle out within Baldoyle Bay. Given the fine sediments involved, and depositional nature of the mudflat habitat, this is not considered to pose a risk to the environment of Baldoyle Bay.

The operation of the proposed storm outfall could introduce pollutants into Baldoyle Bay in the form of heavy metals and hydrocarbons from surface-water run-off of hard surfaces such as roads and car parks. Such substances can have negative effects on aquatic ecology and accumulate in the fine sediments.

5.3 Changes to hydrology

A detailed study carried out by RPS (2017) showed that any changes to flow velocity will be restricted to the channel from the outfall to the main channel of the Sluice River, while there will be no significant impact on the sediment transport regime due to the proposed outfall. In light of this, there will be no significant impact on the mudflat or saltmarsh habitats of Baldoyle Bay due to changes in flow from the proposed development.

5.4 Spread of invasive species

Invasive species can transform ecosystems and threaten native habitats and species (Kelly *et al.* 2013). Common Cord-grass was recorded within the study area, with a high cover in the saltmarsh habitat, while Japanese Knotweed was recorded in terrestrial habitat the southeast. These alien invasive species are listed under the Third Schedule of the S.I. 477/2011. Under these regulations, any person who "...plants, disperses, allows or causes to disperse, spreads..." shall be guilty of an offence. The Japanese Knotweed is well outside the work site and has been treated with herbicide, resulting in no new growth around the dead stems and so there is no risk of this species being spread by the proposed works. As the work vehicles will not be permitted on the Annex I mudflat and sandflat habitat, there is little risk of the work resulting in the spread of Common Cord-grass within the site or to other sites; however, appropriate biosecurity measures should be implemented to ensure this is the case.

6 Mitigation measures

6.1 Habitat loss & disturbance

There will be no loss or disturbance to Annex I habitats during the construction of the proposed outfall and disturbance to surrounding non-annex habitats will be minimised by limiting the working area.

6.2 Pollution

Pollution events during construction works will be avoided through the use of well-maintained plant and machinery, the avoidance of refuelling on-site and the presence of appropriate oil spill kits with staff trained in their use. Best practice guidance on working in the vicinity of surface waters will be

followed, such as *Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters* (IFI, 2016).

During the operation phase, pollution issues will be minimised by implementing Sustainable Urban Drainage Systems (SuDS) on the development lands serviced by the proposed storm outfall as recommended in the Greater Dublin Strategic Drainage Study (Fleming *et al.*, 2005). Source, site and regional controls will be included.

6.3 Spread of invasive species

Appropriate biosecurity measures should be implemented to prevent the spread of invasive species. These may include the marking off of the construction site from areas where Common Cord-grass is present, the use of signage, and the washing down of vehicles before moving to another site.

7 Residual impacts

With the implementation of the proposed mitigation measures, the only impact of note remaining will be the loss and disturbance to a limited area of marginal, roadside non-annex habitat.

8 'Do nothing' scenario

Should the proposed development not go ahead, and in the absence of any other anthropogenic impact, there will be no change to the ecology of Baldoyle Bay beyond those caused by natural processes.

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Appendix I – Map

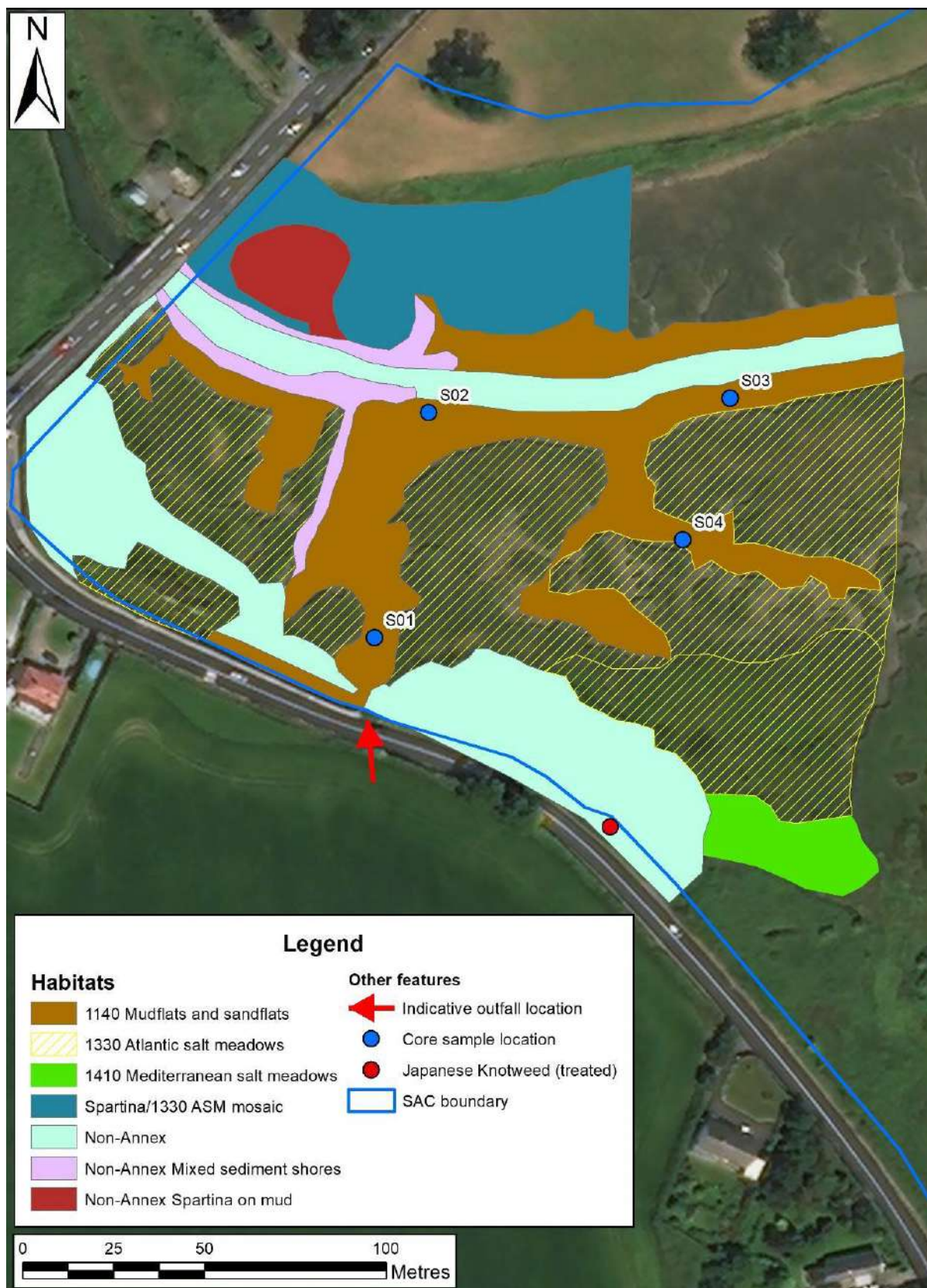


Figure A1. Habitat map of proposed of proposed storm water outfall location showing Annex I habitats.

Appendix II – Tables

Table A1. Location of infaunal core samples in Baldoyle Bay, Co. Dublin.

Sample station	X_Irish Grid	Y_Irish Grid	X_ITM	Y_ITM
S01	323626	242374	723550	742398
S02	323641	242436	723565	742460
S03	323724	242440	723648	742464
S04	323711	242401	723635	742425

Appendix III – Plates



Plate 1. Sea-purslane-dominated Annex I 1330 Atlantic salt meadows; Common Cord-grass is apparent as lighter green in background



Plate 2. Dense swathe of the invasive grass Common Cord-grass



Plate 3. Sea-purslane-dominated Annex I 1330 Atlantic salt meadows; Common Cord-grass is apparent as lighter green in background



Plate 4. Expanse of Sea plantain/Thrift-dominated 1330 Atlantic salt meadows



Plate 5. Habitat transition between lower salt marsh (left) and upper salt marsh (right)



Plate 6. Non-Annex habitat of Common Couch, Sea beet, Red Fescue and Perennial Sow-thistle



Plate 7. Saltmarsh creeks



Plate 8. Annex I 1140 Mudflats and sandflats



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Appendix 4 – Water Quality Report (JB Barry Ltd) incorporating a letter from Irish Water (dated 13th December 2017)

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St. Marnock's II DAC and Clear Real Estate
Investments plc

Portmarnock South Phase 1B

Water Quality Report in support of Natura
Impact Statement

December 2017



Document Control Sheet

Client:	St. Marnock's II DAC and Clear Real Estate Investments plc				
Project Title:	Portmarnock South Phase 1B				
Document Title:	Natura Impact Statement - Water Quality Report				
Document No.:	TOC (incl.)	List of Tables (incl.)	List of Figures (incl.)	Pages of Text	Appendices
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SECTION 1: Introduction

1.1 St. Marnock's II DAC and Clear Real Estate Investments plc are applying for Planning Permission to An Bord Pleanala (ABP) for a residential development at Portmarnock South Phase 1B in the townlands of Maynetown and Portmarnock, Co Dublin. The development will consist of 150 residential units, associated roads, footpaths, private driveways, landscaping, site services, SuDS measures including a regional wetland, a surface outfall to Baldoyle Estuary and sundry related works. This report has been prepared in support of the Natura Impact Statement (NIS) which forms part of the Planning Application Documentation to An Bord Pleanala. It takes account of the requirements of the Portmarnock South Local Area Plan (2013) including Appendix 1 - SuDS Strategy and the Fingal Development Plan (2017-2023).

1.2 This report addresses the following:

- Impacts of surface water discharges on water quality in the Baldoyle Estuary
- Impacts of foul effluent discharges on water quality in the Mayne River and the Baldoyle Estuary

Section 2: Surface Water Quality

2.1 The foul and surface water sewer networks will be on separate systems. No foul effluent will discharge to the surface water system. The surface water system for the entire Portmarnock South LAP lands is divided into two catchments namely:

- Catchment No 1 (c. 37.55 ha as shown in Figure 1 below)
- Catchment No 2 (c. 1.77 ha along Station Road as shown in Figure 1)



2.2 Catchment No 1 includes the majority of the Phase 1B area and drains to the Baldoyle Estuary via a proposed regional wetland and new surface water outfall as shown on drawings Y17205-C-201, C-202 and C-204. The surface water network for Catchment No 1 has been designed to cater for the existing Phase 1A, proposed Phase 1B and future phases of the entire Portmarnock South LAP Development with the exception of Catchment No 2. Catchment No 2, containing the remainder of Phase 1B, drains via a proposed detention pond to the existing surface water network in Station Road prior to discharge through an existing surface water outfall to the Baldoyle Estuary.

2.3 SuDS (Sustainable Urban Drainage Systems) is defined in the SuDS Manual, CIRIA C753, 2015 The SuDS Manual as follows:

"Drainage systems that are considered to be environmentally friendly causing minimal or no long-term detrimental damage."

The SuDS strategy adopted for the proposed Phase 1B development provides a comprehensive approach to the management of surface water on the site in line with the SuDS triangle namely, water quality, water quantity and amenity/biodiversity. The treatment train approach has been adopted for the design of the surface water system for the development. This approach uses suitable SuDS measures in providing source, site and regional controls. The SuDS recommendations included in the Portmarnock South LAP have been assessed and have been included where deemed appropriate and suitable for this development. The surface water wetland is included as one of the essential SuDS measures for the development.

2.4 The various SuDS measures proposed for Phase 1B are discussed below under the following headings:

- Source Controls
- Site Controls
- Regional Controls

2.5 Source Controls

Source Control measures can be defined as: *"the control of runoff at or near its source"* (in the case of this Development the individual buildings, associated footpaths and driveways).

SuDS measures which are proposed within the curtilage of dwellings include the following:

- Permeable Paving for private driveways and footpaths.
- Water butts for the individual housing units for car washing, garden and plant watering.
- Individual soakaways in rear and front gardens.

There is provision for overflows from the above source controls via the house surface water drains to the public surface water sewers in the road reservation.

2.6 Site Controls

Site control is defined as: *"a control which is designed to control storm water quality and/ or quantity for a small development or site"*

SuDS measures which are proposed as site controls within public road reservations and public open space include the following:

- Bioretention areas within public open spaces.
- Swales running parallel to the road carriageways/footpaths.
- Filtration trenches running parallel to the road carriageways/footpaths.
- Silt and Hydrocarbon interceptors for road carriageways/carpark areas.
- Detention Pond for Catchment No 2.

2.7 Regional Controls

Regional Control is defined as: "a storm water control practice which is designed to control storm Water quality and/or quantity from a large urban development, or a group of developments"

It is proposed to provide a surface water wetland as a regional control as recommended in the SuDS Strategy Briefing Document, Portmarnock South LAP for the entire Catchment No 1. The surface water wetland will be located as shown on Drawing No Y17205-C-202. All surface water from Catchment No 1, which includes the existing Phase 1A, the majority of Phase 1B and all future phases will pass through the wetland for attenuation and treatment prior to discharge to Baldoyle Estuary. The surface water wetland will have a minimum permanent water depth of 300mm and will provide pollutants removal through biological treatment and settlement. A settlement forebay will be provided to decrease velocity and sediment loading. The wetland will comply with the Storm Water Wetland Briefing Paper, GSDSDS. Detailed Design of the wetland will be agreed with Fingal County Council.

2.8 Set out in the Table below is a Quality, Quantity, Community and Environmental Performance Matrix for the SuDS measures proposed for Phase 1B. This performance matrix is based on Tables A.5, Appendix 1, Portmarnock South LAP.

*limited data available, ** There may be some public safety concerns with open water that require

SuDS Group	Technique	Water Quality Treatment Potential					Hydraulic Control				Maintenance	Community Acceptability	Cost	Habitat creation potential
		Total Suspended Solids	Heavy Metal Removal	Nutrient (Phosphorus, nitrogen) removal	Bacteria removal (*)	Capacity to treat fine suspended sediments and dissolved pollutants	Runoff Volume Reduction	0.5 (1/2 yr)	Suitability for flow rate contr (10/30 yr)	0.01 (100 yr)				
Wetland	Pond/wetland	H	M	H	M	H	L	H	M	H	H	H	H	H
Infiltration	Soakaway	H	H	H	M	H	H	H	H	L	L	M	M	L
Filtration	Bio-retention / filter strips	H	H	H	M	H	L	H	M	L	H	H	M	H
		H	H	H	M	H	L	H	M	L	M	M	M	L
Detention	Detention Basin	M	M	L	L	L	L	H	H	H	L	H	L	M
Open Channels	Conveyance swale	H	M	M	M	H	M	H	H	H	L	M	L	M
Source Control	Permeable pavement	H	H	H	H	H	H	H	H	L	M	M	M	L

addressing at design stage
H = high potential, M = medium potential, L = low potential

The SuDS measures proposed for Catchment No's 1 & 2 incorporate the benefits of the SuDS triangle namely water quality, water quantity and amenity/diversity.

An examination of the above performance matrix demonstrates the following:

- Water quality is enhanced through the use of soakaways, water butts, permeable paving, filtration trenches, bio-retention areas, swales, detention pond and the Regional Wetland. In addition, all surface water will pass (including from roads) through hydrocarbon interceptors prior to entering the Regional Wetland

International research shows that water quality benefits will arise from the implementation of the above SuDS Measures.

- Water quantity discharge is controlled through the use of water butts, soakaways, permeable paving, filtration trenches, bio retention areas, swales, detention pond and the Regional Wetland. The maximum permissible (greenfield) outflow of 200l/sec from the Regional Wetland for Catchment No 1 is restricted to the 1:100 year critical storm. This outflow, as noted above, is relatively small and will have no significant impact on the Baldoyle Estuary which is a substantial water body.
- Amenity/diversity is enhanced by the provision of the proposed SuDS measures as outlined above

- 2.9 The surface water run-off from the Development will pass through a minimum of 3 SuDS Devices. This treatment train approach complies with Volume 2, New Development, GDSDS and the Portmarnock South LAP, Appendix 1.
- 2.10 The surface water system will be in accordance with "The Regional Code of Practice for Drainage Works, Version 6.

SECTION 3: Operation and Maintenance – SuDS Measures

- 3.1 The SuDS components proposed for Phase 1B will be operated and maintained strictly in accordance with the requirements of the SuDS Manual, CIRIA 753, 2015 to ensure that "water quality standards are maintained".
- 3.2 Each SuDS component proposed is referenced below to the relevant operation and maintenance sections of CIRIA 753, 2015 where appropriate.
- Water butts will be operated and maintained in accordance with "Good Practice and the Manufacturers Specification".
 - Soakaways will be operated and maintained in accordance with Part D, Sub-Section 13.12 including Table 13.1 and Section 32 of CIRIA 753.
 - Permeable pavements will be operated and maintained in accordance with Part D, Sub-Section 20.14 including Table 20.15 and Section 32 of CIRIA 753
 - Bioretention areas will be operated and maintained in accordance with Part D, Sub-Section 18.12 including Table- and Section 32 of CIRIA 753.

- Filter areas will be operated and maintained in accordance with Part D, Sub-Section 16.12 including Table 16.1 and Section 32 CIRIA 753.
- Swales will be operated and maintained in accordance with Part D, Sub-Section 17.12 including Table 17.1 and Section 32 of CIRIA 753.
- Hydrocarbon interceptors will be operated and maintained in accordance with Part D, Sub-Section 14.12 including Table 14.2 and Section 32 of CIRIA 753.
- Detention Basins will be operated and maintained in accordance with Part D, Sub-Section 22.12 including Table 22.1 and Section 32 of CIRIA 753.
- Stormwater wetlands will be operated and maintained in accordance with Part D, Sub-Section 23.12 including Table 23.1 and Section 32 of CIRIA 753.
- Waste management of the various SuDS components proposed for Phase 1B will be carried out strictly in accordance with Section 33 of CIRIA 753.

SECTION 4: Foul Effluent Disposal

- 4.1 Foul effluent in the Portmarnock area drains to the existing Portmarnock Bridge pumping station from where it is pumped to a 225mmØ foul sewer in Coast Road, and then flows by gravity to the wet well of the Mayne Road pumping station.

Effluent is then pumped from the Mayne Road pumping station to the North Fringe Sewer which in turn is connected to the Sutton Pumping Station. Effluent from the Sutton Pumping Station is pumped across Dublin Bay via a submarine pipeline to the Ringsend Waste Water Treatment Plant.

Due to capacity issues with the existing Portmarnock Bridge pumping station, Irish Water is advancing plans to construct a new pumping station to replace the existing one on lands north west of the Portmarnock Bridge roundabout. The new pumping station will be connected directly to the North Fringe Sewer and will cater for all flows from the Portmarnock South LAP lands and all flows from the decommissioned Portmarnock Bridge pumping station. The provision of the new IW pumping station will allow for the downsizing of the Mayne Road pumping station which will then cater for local flows only. Irish Water is scheduled to make a planning application for the new pumping station shortly and the pumping station is scheduled for completion in Q3 2019 subject to the statutory processes.

- 4.2 Planning permission for Phase 1A (Reg. Ref F13A/0248, 101 units) of the Portmarnock South project was granted in July 2014. Construction is currently well advanced with an expected completion date of Q1 2018.

The planning permission permitted foul effluent from the Phase 1A development to drain by gravity to the existing 225mm sewer in Coast Road and then to the Mayne Road pumping station. A condition of the permission is that the pumping station is upgraded by carrying out the following works:

- Provide an additional duty assist/stand by pump.
- Reconfigure and upgrade the existing internal pipework and cabling.
- Provide a connection point in the control panel for a mobile generator.

These works are in progress and will be complete by the end of January 2018. On completion, the works will provide an enhancement on the current position and will have a positive impact on the Mayne River and Baldoyle Estuary.

The current risk of overflowing to the Mayne River is low as Fingal County Council has advised only a very small number of overflows occurred in the past year. It is understood there were no pump failures during these overflows and that they occurred during extreme rainfall events. The installation of the new pumping regime as outlined above will reduce the risk of overflowing to the Mayne River.

The upgrade is consistent with the requirements set out for the Mayne Road pumping station in Section 9.2, Wastewater Network and Treatment, Portmarnock South LAP.

- 4.3 Flows from the proposed Phase 1B development (150 units) will drain to a temporary pumping station with 24-hour emergency storage located in the north-east corner of the site. These flows will be pumped to the existing 225mm outfall sewer as shown on Drawing Y17205-C-200. This sewer is connected to the Mayne Road pumping station, currently being upgraded as described above. A telemetry link will be provided between this temporary pumping station and the Mayne Road pumping station. The purpose of this link is to ensure that no foul effluent will discharge to the Mayne Road pumping station when capacity at the Mayne Road pumping station is limited, i.e. during periods of heavy rain or when the pumping station is not operating. Under these conditions, the effluent will drain to the emergency storage tank.

Agreement has been reached with Irish Water for this connection with 24-hour emergency storage (refer to Irish Water's Confirmation of Feasibility Statement included in Appendix 1) as a temporary measure pending the construction of the new Irish Water pumping station to replace the existing Portmarnock Bridge pumping station as described in 5.1 above. When the new Irish Water pumping station is operational, all effluent from the Portmarnock South LAP lands will be permanently diverted into the new pumping station. The proposed new pumping station and associated works are consistent with the requirements set out for disposal of foul effluent in Section 9.2, Wastewater Network and Treatment, Portmarnock South LAP.

- 4.4 The upgrade of the existing Mayne Road pumping station and the replacement of Portmarnock Bridge pumping station will significantly reduce the risk of overflow events. These provisions will have a positive cumulative effect on the Mayne River and Baldoyle Estuary.

SECTION 5: Relevant Drawings

- 5.1 The following Drawings should be read in conjunction with this report.

Drawing No	Title
Y17205-C-200	Proposed Foul Sewers
Y17205-C-201	Proposed Storm Sewers
Y17205-C-202	Regional Wetland Proposed Plan & Sections
Y17205-C-203	Detention Pond Proposed Plan & Sections
Y17205-C-204	Details of Surface Water Outfall

Appendix 1

Irish Water

Confirmation of Feasibility Statement

JB Barry & partners
Classon House
Dundrum Business Park
Dublin 14

Letter Ref: CDSCOF6



Uisce Éireann
Bosca OP 860
Oifig Sheachadta
na Cathrach Theas
Cathair Chorcaí

Irish Water
PO Box 860
South City
Delivery Office
Cork City

www.water.ie

13th December 2017

Dear Sir/Madam,

**Re: CUST16072 pre-connection enquiry – Subject to contract |
Contract denied
150 Unit Residential Development, Phase 2 Portmarnock South,
Station Road, Portmarnock, Co. Dublin.**

Irish Water has reviewed your pre-connection enquiry in relation to water and wastewater connections at Portmarnock South, Station Road Portmarnock (the **Premises**). Based upon the details you have provided with your pre-connection enquiry and on the capacity currently available as assessed by Irish Water, we wish to advise you that, subject to a valid connection agreement being put in place and the conditions listed below, your proposed connection to the Irish Water network can be facilitated.

Strategic Housing Development

Irish Water notes that the scale of this development dictates that it is subject to the Strategic Housing Development planning process.

You are advised that this correspondence does not constitute an offer in whole or in part to provide a connection to any Irish Water infrastructure and is provided subject to a connection agreement being signed and appropriate connection fee paid at a later date.

A connection agreement can be applied for by completing the connection application form available at www.water.ie/connections. Irish Water's current charges for water and wastewater connections are set out in the Water Charges Plan as approved by the Commission for Energy Regulation.

Should you wish to have any of the above progressed by Irish Water or if you have any further questions, please contact Conor McCarey from the design team on 01-8925442 or email cmccarey@water.ie For further information, visit www.water.ie/connections

Yours sincerely,

Maria O'Dwyer

Connections and Developer Services

Appendix 5 – Construction Management Plan (Linesight Ltd)

Planning Application: Construction Management Plan

Portmarnock South Phase 1B

Prepared for:

**St Marnock's II DAC & Clear Real Estate
Investments plc**

Portmarnock South Phase 1B

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Portmarnock South Phase 1B

1.0 Introduction

Linesight Project Management has prepared this Construction Management Plan as part of a planning application for submission to the An Bord Pleanala on behalf of St. Marnock's II DAC and Clear Real Estate Investments plc. The proposed development, described generally as Phase 1B, will consist of 150 residential units including associated car parking, landscaping boundary treatments and amenities in Portmarnock Co. Dublin and follows the initial Phase 1A [under construction] works carried out under Planning Permission Ref F13A/0248.

The Construction Management Plan sets out the proposed arrangements and measurements which may be undertaken during the construction phase of the project in order to mitigate and minimise disruption/disturbance to the area around the site. The purpose of this plan is to summarise the possible impacts of the construction work activities and measures to be implemented to guide the Main Contractor who will be required to develop and implement the detailed Construction Management Plan post grant of planning permission and compliance with related conditions during the course of the construction period.

The Main Contractor, Designers and Owner are responsible to ensure that all relevant statutory and regulatory obligations are met, including compliance with planning conditions, Health & Safety legislation and promoting best practice industry standards.

As is normal practice, the Main Contractor is responsible for the construction methodology, activities and the sequencing of construction works on the Phase 1B development. The Main Contractor is also responsible for the design and installation of all temporary works and associated safety required to complete the permanent works. This Construction Management Plan will be used by the Main Contractor before commencement of Phase 1B works to develop a detailed Construction Management Plan during the execution stage and is subject to agreement with An Bord Pleanala as part of compliance with stated conditions of planning permission.

Development Description

The development will consist of 150no units. (52no. duplex / apartments and 98no. houses) ranging between 2 and 3 storeys in height comprising the following:

50no. 3 bed 2 storey houses, 48no. 4 bed 2 storey houses, 26no. 2 bed duplex / apartments at ground floor with 26no, 3 bed duplex / apartments on two floors above (3 storey overall) and all associated infrastructure and site works, amenity and landscaping including bin and cycle storage proposed for all duplex / apartments and 1no.electricity sub-stations.

Portmarnock South Phase 1B

Site Location

The Phase 1B site forms part of the ongoing St Marnock's residential development at Portmarnock, North County Dublin.

The St Marnock's residential development is broadly bounded by Station Road to the north of the site, the Dublin-Belfast railway and station carpark to the western boundary and Coast Road to the east of the site

The scope of the Phase 1B development is indicated on BKD architects drawing No.6158-004 and 6158-005 and the overall landscape masterplan drawing No.6312-300.

Reference Documents

The Construction Management Plan is to be read in conjunction with all Planning Application documentation provided to the An Bord Pleanala and should reference the requirements, recommendations and guidance set out in the attached drawings, specifications and reports in support of this phase of the development.

2.0 Construction Programme and Phasing

Subject to Planning Approval, the Phase 1B development is anticipated to start construction in April 2018. It is anticipated that Phase 1B will be completed by December 2019, refer to the outline plan, drawing no. 6158-101 prepared by BKD Architects, the phasing and sequencing of construction will be indicated on the Main Contractors programme and will be subject to overall agreement with An Bord Pleanala.

The phasing of the Phase 1B development is broadly limited by the sequencing and resolution of archaeology in the north east corner of the proposed phase 1B development and completion of the permanent stormwater wetland and associated outfall to Baldoyle Estuary as outlined in JB Barry drawing Y17205-C-204 Rev. 4 and Water Services Report included with the planning application documents.

The proposed development is identified to be within a zone of archaeology interest and it is anticipated subject to planning conditions that the developer will be expected to comply with conditions relating to archaeology and monitoring during all stages of excavation works and in this regard the phasing of the 1B development will take due regard of archaeology during construction works. The Construction Management Plan takes note of any prior notifications to the National Parks and Wildlife Service [NPWS] and the National Monuments Service [NMS] in advance of construction of Phase 1B works.

Portmarnock South Phase 1B

The site establishment and initial phases of the works will include;

- Mitigation measures for tree and hedgerow protection fencing, refer to Brady Shipman Martin drawing 6312-607. The protection of hedgerow will be undertaken in accordance with Brady Shipman Martin report and conditions of planning permission.
- Establishment and fencing off of all identified work areas, including identified Giant Hogweed areas.
- Protection of areas of archaeological and national monument interest, this must be completed in accordance with the archaeological report and in accordance with the conditions of planning permission
- Relocation of the existing construction compound from the Phase 1A development to the Phase 1B development and including fencing off the newly located construction compound as indicated on JB Barry drawing Y17204-C-108 Rev. D, these works will include the connection of all temporary services to the compound.

In the second phase of construction works the Main Contractor will undertake;

- Construction of a new site entrance off Station Road and access haul routes as indicated on JB Barry drawing Y17204-C-101 Rev. F.
- Surveying and programming of phased 1B soil pre-stripping and soil storage.
- Construction of the permanent stormwater wetland and all associated drainage and outfall to Baldoyle Estuary, the completion of which is subject to necessary Foreshore Licence and Road Opening as indicated on JB Barry drawing Y17204-C-202 Rev. F. Particular regard to the requirements of the Natura Impact statement and the conservation management plan during this phase of works.
- Establishment of the Health & Safety Plan, and all associated mitigation measures, signage, induction and liaison with third party regulatory bodies and residents.

The third phase of construction works will generally include;

- The construction of the development as per the Main Contractors programme which will indicate the developments phase of works.
- All infrastructure works and utilities to be provided for each residential unit
- All final connections to the stormwater drainage and the foul drainage to the main outfall
- Phased handover of completed residential units
- The completion of all landscaping, footpaths and general pedestrian & cycle routes
- Demobilisation of all temporary services / works as necessary related to the completion of the Phase 1B development

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Site Operation Hours

The site operation hours are anticipated to be from 8am to 7pm, Monday to Friday and 8am to 1pm on a Saturday or as stated in the Grant of Planning Permission and attached conditions. For any operations occurring outside of these hours, it is anticipated that the Main Contractor will liaise with the Local authority. As is best practice, it is anticipated that the Main Contractor will provide notification by regular newsletter and /or monthly meetings with the neighboring residents that may be affected by the proposed construction work activities generally, and working hours operating outside stated times.

3.0 Health & Safety

The Health & Safety Management System translates Health and Safety policy into processes so that environmental responsibilities and performance can be monitored, reported and improved. The PSDP, JB Barry and Partners are appointed during the design stages to ensure effectiveness in addressing and coordinating safety and health matters from the very early stages of the Phase 1B project.

The PSDP and appointed PSCS shall liaise throughout the construction of the Phase 1B development to ensure that all relevant notifications, procedures, communication and documentation is in place prior to commencement of construction activities and that the Health & Safety Management System to be implemented on site is fully coordinated and managed effectively.

The PSCS, shall also work closely with the site management team, including the site safety officer to ensure that all construction operatives are inducted to best in practice standards to ensure that safety is prioritised on site and that all operatives are made aware of their obligations. Communication is considered key to ensuring Health & Safety standards are met and exceeded, and in this regard the Main Contractor and PSCS will communicate all safety matters to site operatives, sub-contractors, material suppliers, visitors and local residents.

The construction specific H&S risks and mitigation measures associated with the construction of Phase 1B are broadly outlined as follows;

H&S Risks: Protection of Adjoining Buildings

The Phase 1B construction site is located to a nearby pocket of existing houses opposite the existing roundabout junction at Station Road and Coast Road and will adjoin the Phase 1A development [under construction].

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Mitigation Measures

- Site enclosures / boundary fencing will be erected in compliance with safety requirements and align with Conditions of Planning.
- Suitable hoarding / screening will be provided as necessary to protect adjoining properties.
- Minimise work areas close to established dwellings and take all necessary steps to as practical to reduce the impact of the works on local residents and adjoining properties.
- The construction traffic management plan will be developed by the Main Contractor and implemented and managed for the duration of the Phase 1B works and will take full account of adjoining properties / residents.

H&S Risks: Noise & Vibration from Construction Activities

Mitigation Measures

To minimise the anticipated noise and vibration impacts during excavation and general construction activities for the Phase 1B works, the following will be considered;

- The proposed construction compound is located to the west of the townland boundary and will be screened as required to protect adjoining properties, refer to drawing Y17204 – C-108 Rev D.
- Haul routes to the east of the hedgerow, around the wetland to the estuary outfall will be temporary routes only to be removed after construction of the attenuation wetland ponds and outfall and return to the pre-construction state
- Batch mixing will be located to cause minimum effect to local residents and adjoining properties.
- Noise mitigation equipment to be fitted to construction equipment as necessary
- Machinery / equipment covers are to be used to reduce sound transmission
- Mitigate noise through effective excavation methodologies.
- Excavation works as far from existing structures as possible and monitoring of vibration whilst working towards existing properties.
- Heavy rock breaking equipment if required will be minimised closer than 10m to adjoining properties.
- Site enclosures / boundaries and appropriate sound screening to be employed as necessary to ensure separation of construction activities from adjoining neighbors.

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- No work is to occur outside approved working hours or as by agreement with An Bord Pleanála.
- Site operatives to wear PPE and appropriate ear protection as required to comply with legislative and best practice

H&S Risks: Dust from Construction Works

Normal construction activities will generate dust. The Main Contractor is required to take all necessary measures to mitigate the impact of dust on adjoining properties and residents.

Mitigation Measures

- Use of site enclosures / boundaries to prevent widespread of dust.
- Update site operatives during toolbox type discussions.
- Regular cleaning of site.
- Hosing down of construction access / haul roads during dry and windy weather.
- Regular cleaning of adjoining public roadways.
- Hosing down and or wheel wash of construction vehicles leaving site.
- Cover protection to be provided to trucks arriving on site with fill material and departing site with spoil material
- Site operatives must wear PPE and appropriate eye and dust protection at all times

H&S Risks: Stormwater runoff

The management of storm water during construction and the potential impact on the surrounding environment is of key importance. The Main Contractor must identify all potential risks related to storm water during construction and take all necessary measures to mitigate the impact on the adjoining environment.

Mitigation Measures

- Use of onsite sediment basin and treatment prior to pump out.
- Regular checks that stormwater runoff measures are maintained.
- Redirection or catching of offsite stormwater prior to exiting site.
- Regular cleaning of the site to removal waste material.
- Monitor weather forecasts and take action in advance of weather warnings.
- Completion of the permanent wetland attenuation ponds and associated outfall works

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H&S Risks: Removal of Hazardous Materials

Mitigation Measures

- Prior to commencement of works a hazardous material & dangerous goods assessment should be completed by the Main Contractor as part of design/construction safety risk procedures. Subject to outcomes of any surveys and assessments, a disposal methodology plan must be aligned with regulatory and statutory requirements for safe disposal of any hazardous or non-hazardous waste materials if necessary.

H&S Risks: Waste Water

Mitigation Measures

- All foul water generated on site from construction activities will be removed from a localised tank and disposed of off-site to a licensed disposal area or connected to the local authority drainage system by agreement with An Bord Pleanála.

H&S Risks: Construction Traffic

Construction related traffic can often impact normal safety due to the increased traffic loads, vehicular movements and transport of large volumes of related construction materials near construction sites. The Main Contractor is responsible for managing construction related traffic during the construction period and will take all necessary mitigation measures as broadly outlined below, this is further outlined under section 4.0

Mitigation Measures

- The Construction Traffic Management Plan should be compliant with planning approval and conditions of permission.
- A detailed Construction Traffic Management plan is to be prepared by the appointed Main Contractor for the execution of the works.
- Appropriate control measures are employed and managed by the Main Contractor to ensure separation of construction activities from the public/local residents.
- The Main contractor and PSCS must include all necessary barriers and protective measures to site enclosures and phasing boundaries.
- Ensure appropriate directional signage is in place for access pathways and trafficable areas and amended, as the Phase 1B works progress through construction to completion and handover.

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- No unauthorised access to construction zones.
- Ensure site personnel use identified traffic routes to site as shown in the construction traffic management plan.
- Ensure that construction traffic is planned and managed with full regard to control and management requirements of the Giant Hogweed Eradication Plan.
- General briefing to all site personnel on an ongoing basis through initial site safety induction and regular 'tool-box' type talks with operatives.

4.0 Construction Traffic & Parking Management Plan

The construction of Phase 1B works, anticipates a peak on site workforce of circa 150 operatives including operatives associated with supply and delivery of materials/equipment and collection removal of soil/waste from the site. The Construction Management Plan is developed to address issues relating to construction traffic management and the constraints imposed by site conditions and public traffic movements. In the context of this An Bord Pleanála there are a number of key issues that will impact the construction stage of Phase 1B as follows;

- Construction of a new site access from Station Road.
- Site access and egress from the site
- Interaction with adjoining traffic movements on Station Road, the Dart Parking Area and the Phase 1A development.
- Increased traffic movement at Station Road and adjoining approach roads
- Construction on site car-parking.
- Materials and equipment set down areas for suppliers and timing of deliveries.
- Potential for increased levels of noise, dust and vibration
- Avoidance of areas impacted by Giant Hogweed.

Mitigation Measures

The Construction Management Plan is developed to identify the impacts of construction traffic through the provision of a series of controlled and managed mitigation measures described generally as follows;

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Site Access

- The construction site will be accessed via a new site entrance located off Station Road as indicated on JB Barry drawing no. Y17204-C-101. It is the site manager's duty to keep the site secured and managed for the duration of construction works.
- The security access to the site will be permanently controlled during working hours throughout the duration of phase 1B. The access and egress gates will be marked 'For Construction Traffic Only' and notification signage will be located within agreed approach distances from the construction traffic site access / egress.
- Approach directional and information signage will be deployed to approach roads to the site by agreement with An Bord Pleanala.
- On site signage will be incorporated to manage traffic conditions within the confines of the site.
- Temporary parking of delivery vehicles will not be permitted on the public road network leading to the construction entrance on Station Road.
- Material deliveries will be guided to a material parking and set-down area to be agreed with the Main Contractor. It is the responsibility of the Main Contractor and site manager to install directional and instructional signage to guide construction traffic around the Phase 1B site.
- Speed limits and speed reducers will be incorporated within the Phase 1B site and marshalled by the site manager.
- All operatives car parking will be secure and managed to ensure reverse-in car parking on arrival.

Construction Traffic Routing

Construction traffic will be restricted to the primary routes in the vicinity of the site. The heavy good vehicles (HGVs) routes to and from the site will depend on the location from where materials are sourced and the end destination for surplus demolition and excavation materials not reused on site. The locations of concrete batching plants and suitable waste recovery / waste disposal facilities have yet to be determined and will be identified when the Main Contractor is appointed and the Construction Traffic Plan is submitted to An Bord Pleanala through Planning Compliance submissions and approvals. The HGV routes from the construction site will be agreed with the Local Authority before commencement of Phase 1B works on the site.

Any requirement for temporary road closure or road opening will be agreed by license with Local Authority and coordinated with essential services and other appropriate authorities as required.

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Minimise Construction Vehicle Movements

Construction vehicle movements would be minimised through;

- Consolidation of delivery loads to / from the site and managing large deliveries on site to occur outside of peak periods
- Optimise the removal of soil from the site
- Contractor is to manage the schedule with procurement of materials and heavy / large equipment to the site

Site Compound & Materials Storage

The proposed site compound is indicated on JB Barry drawing no Y17204-C-108 Rev D, as shown in appendix 1, and is located to the west of townland boundary. This drawing also shows the proposed temporary haul routes to the east of the hedgerow, around the wetland and down to the estuary outfall, these will be removed after construction of the wetlands attenuation ponds and outfall.

Storage of building materials will be confined to dedicated and clearly marked material storage areas within the boundaries of the development or by agreement with the Local Authority. All materials handling will be predominantly by forklift and or mobile cranes.

Manage and Monitoring Construction Traffic Safety

- Review of construction vehicle movements and minimise where possible
- Consolidate delivery loads to / from the site and managing large deliveries on site to occur outside of peak traffic periods in the immediate area
- Provision of adequate storage space on site
- Review the overall construction traffic management strategy to minimise construction material quantities as much as possible
- Regular review of the performance measures identified from the plan and continuous measures to improve
- Coordination and optimisation of operatives car parking
- Review any safety or operational incidents and actions taken / required to address the cause of such incidents
- Monitor complaints and corrective actions taken
- Review all external and internal signage

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In general, the Construction Traffic Management Plan will include the following key objectives;

- The Construction Traffic Management Plan will be developed by the Main Contractor prior to commencement of works on site and by agreement with An Bord Pleanála by means of Planning Compliance submissions and approvals from the Local Authority. The Main Contractor's construction manager is responsible for managing the plan.
- During the execution of the construction works, only site operatives and authorized visitors shall be permitted to enter the works areas with appropriate PPE safety gear. Only authorized vehicles are permitted on site. The Main Contractor's construction site manager is responsible for managing access for site operatives and authorised visitors
- The Main Contractor's construction site manager is responsible for managing the delivery of materials and equipment to minimise disruptions to other users and local residents
- All construction traffic for internal defined works shall access the site via the proposed marked main site access point on Station Road
- Truck movements are to be specified and incorporated into training and induction and restricted to specified routes
- All parking areas for operatives and visitors are to be clearly marked and monitored for compliance with the plan
- Routes for construction traffic will be clearly marked and temporary lighting provided within the site as necessary
- Separated pedestrian traffic routes for site operatives within the site and the public where there is potential for public engagement with the construction works will be clearly marked and guarded as required
- Speed limits imposed shall be strictly adhered to during the construction of the works

5.0 Storm Water Management Plan

The proposed Phase 1B development site is located on lands which are in close proximity to the Baldoyle Estuary which is a designated Special Area of Conservation [SAC], Special Protection Area [SPA], proposed Natural Heritage Area [pNHA], Ramsar Site and Statutory Nature Reserve. The designations listed above highlight the importance of this natural amenity and this Construction Management Plan seeks to address and mitigate the constructability issues and potential risks associated with this development in close proximity to the Baldoyle Estuary. For the purposes of this report, refer generally to JB Barry drawings;

- Y17205-C-200 Rev. F Proposed Foul Sewers Layout.
- Y17205-C-201 Rev. F Proposed Storm Sewers Layout.

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- Y17205-C-202 Rev. F Proposed Regional Wetland - Plan and Sections.
- Y17205-C-203 Rev. D Proposed Detention Pond - Plan and Sections.
- Y17205-C-204 Rev. G Storm Water Outfall Details.
- Y17205-C-205 Rev. C Storm Water Outfall Location Plans.
- Y17205-C-206 Rev. D Alternative Layout of Foul Sewers.
- Y17205-C-207 Rev. A Alternative Layout for Regional Wetland.
- Y17205-C-208 Rev. A Temporary Foul Pumping Station Details.
- Y17205-C-300 Rev. F Proposed Watermain Layout.

It is intended that all surface water from the proposed Phase 1B development will be managed in accordance with the principals of Sustainable Urban Drainage Systems [SUDS]. The foul and stormwater drainage networks are designed as separate systems and no foul effluent will discharge to the surface water system. The surface water system is divided into two catchments;

- Catchment No1
- Catchment No2

Refer to JB Barry's Water Services Report and drawing no. Y17205-C-202 and 203 for details of temporary and permanent storm water attenuation relating to Catchment Area No1 which is designed to cater for the existing, proposed and future phases of the entire development and will drain to the Baldoyle Estuary via the proposed regional wetland.

The construction of the stormwater attenuation, regional wetland and stormwater outfall will be completed during the early stages of construction activities for the Phase 1B works. This allows the temporary attenuation currently serving Phase 1A to be redirected to the permanent stormwater attenuation and opens up the development of Phase 1B houses fronting on to Station Road.

The outfall has been designed to have no impact on the associated Annex 1 habitats in the candidate Special Area of Conservation (cSAC). It is anticipated that the works will be timed to be outside the months November to March – i.e. overwintering period for birds, including Light-bellied Brent Goose.

The timescale of the works to construct the outfall will be determined by the foreshore planning license. A method statement will be lodged with the application for the foreshore license and will be dealt with through the planning compliance submissions that generally cover, the schedule of construction works and details outlining:

- Protection against surface water run-off

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- Protection against potential tidal effects in estuary (for headwall works)
- Removal of all excavated material from headwall construction off site
- Ensuring that no depositing of excavated materials or construction materials on estuary side of Coast Road

Post construction of the outfall the environmental protection measures will include:

- Immediate landscaping/seeding of constructed wetland areas so as to consolidate soil surfaces
- Immediate landscaping/appropriate seeding of disturbed areas around headwall construction

Generally, measures for attenuation, de-silting and hydrocarbon interception will be incorporated for all surface water discharges during construction and operational phases. The falls on access roads and the compound areas will be incorporated to ensure there is no run-off from the site to the adjoining public roads and the Phase 1A development to the west of the proposed Phase 1B development.

The main objectives of the Construction Management Stormwater Plan are noted as follows;

- Minimise and control the construction site to ensure that no unacceptable impact occurs to adjoining waterways, wetlands and the Local Authority stormwater system.
- Ensure that no stormwater migrates to adjoining public roadways and residential areas
- Minimise disturbance to the hydrologic profile of the surrounding landscape
- Maximise opportunity for capture and use of stormwater on site
- Protect ground water from potential construction waste contamination

The construction activities on the Phase 1B site will involve excavation of soils for the construction of the residential buildings. There is potential for excavated and unconsolidated soils to be eroded as a result of wind and rain action over a period. The construction of the Phase 1B development has the potential if not managed to adversely impact;

- The receiving environment of the nearby waterways and wetlands
- Impact the adjoining Phase 1A residential development and adjoining properties on Coast Road
- Hydrology and flooding

The following issues have been identified for mitigation through the construction stage of the Phase 1B development;

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- Potential for contamination as a result of overflow and spillage of fuel and chemicals
- Equipment and plant repair areas could lead to potential for spillage and contamination
- Containment of potential contaminated solids and storm water runoff to storm water outlets and adjoining water course
- Sediment laden water from the construction site that could potential flow into the stormwater inlets
- Site cut off drains eroding and increasing site water sediment loads
- Depositing of dirt and mud from trucks leaving the site onto adjoining roadways
- Containment of bulk soil removal from trucks leaving the site
- Construction and scheduling of permanent stormwater drainage, attenuation and stormwater outfall to the Baldoyle Estuary

In response to the potential issues above, it is considered that soil erosion by significant rainfall and wind in dry weather is a key component of the Construction Management Plan. A stormwater, erosion and sedimentation control map will be prepared prior to site activities and bulk excavations and updated regularly by the Main Contractor as required to ensure it reflects the status of control measures at any time during the works. In support of good practice, the principles of good stormwater management are listed as follows;

- Incorporate petrol interceptors
- Site fuel storage will be provided within bund areas to cater for any potential failure of the fuel tanks
- Limit land disturbance to work areas
- Provide suitable stormwater drainage as designed
- Limit site entry and egress points to Station Road for Phase 1B
- Install temporary swales to manage water runoff if required
- Maintain vegetation as appropriate in and around runoff areas
- Direct runoff from disturbed areas through sediment traps or filters
- Prevent deposition of sediment on the adjoining public roads network due to truck / equipment movement
- Incorporate stormwater management and mitigation measures into site induction programmes

Monitoring and reporting is a key part of the management of the construction works. It is anticipated that the Main Contractor and/or Specialist Bulk Excavation Contractor for the general site stripping and the construction of the attenuation wetland areas will inspect the site weekly and provide particular attention to the following issues;

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- Inspection of sediment controls devices
- Inspect drains and make repairs to damaged drains as required
- Remove spilled soils or other materials as necessary
- Construct additional erosion or sediment control works as necessary
- Removed build-up of sediment from temporary swales
- Maintain records relating to the condition of existing soil erosion and runoff controls
- Record rainfall data and retain records for inspection as requested

The Main Contractor is responsible for managing stormwater on site during construction works and shall review and analyse the cause of any detected non-conformance issues recorded and take appropriate corrective actions to resolve issues.

6.0 Foul Effluent Disposal

The design of the proposed Phase 1B development takes account of the foul effluent disposal for Phase 1A, refer to JB Barry Water Services Report and drawing no's;

- Y17205-C-200 Rev F: Proposed Foul Sewers - Option 1
- Y17205-C-206 Rev D: Proposed Foul Sewers - Option 2

The design allows for the proposed Phase 1B [150no residential units] to drain to a temporary pumping station located in the north-east of the proposed Phase 1B development site as indicated on JB Barry drawing no.Y17205-C-208. This arrangement will include a temporary 24-hour storage tank which will hold back discharges during rainfall events to mitigate the impact on the existing Mayne Road Pumping Station. It is anticipated that the new Irish Water Pump Station will be operational circa Q3 2019 and all foul effluent flows from the existing Phase 1A development, the proposed 1B development and future phases will be diverted to the completed Irish Water Pump Station which will in turn lead to the decommissioning of the temporary pump station, associated pipework and site works proposed as part of this planning application.

7.0 Water Supply

The proposed Phase 1B development will be supplied via the existing water main network in the as shown on JB Barry drawing no.Y17205-C-300.

As referenced in the JB Barry Water Services Report included with this Planning Application, Irish Water have confirmed that water supply to the proposed development is feasible without system upgrades. All watermain works, water conservation measures, metering and pressure control will be designed and installed in accordance with Irish water and the Local Authority

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requirements. It is anticipated that details of the water services installation will be agreed during Planning Compliance submissions.

8.0 Construction Environmental Management

The overall objectives of this plan is to minimise the generation of construction related noise, vibration and dust from the Phase 1B construction activities and to mitigate against such potential impacts on the adjoining residents, wildlife and site operatives. A key component of the management and mitigation of impacts is through effective communication and building of relationships with the community and adjoining residents.

Monitoring and Reporting

The Main Contractor's site manager is responsible for ensuring background levels of dust deposition, vibration and noise levels are continually monitored and reported during the construction of Phase 1B works. The site manager will monitor the data and results to ensure that acceptable levels are managed and that any non-conformance is identified and corrective actions are taken immediately to prevent recurrence.

Control of Noise

By way of comparison with the current site use, noise is a consequence of development and construction, albeit the particular noise associated with construction activities is limited to the duration of the construction project. During the construction activities, noise will be generated by vehicles, heavy machinery and equipment, hand held tools and general site operatives and associated works, including ground excavation and preparation works, concrete works and general building construction.

Construction related noise will comply with BS 5228-1: Code of practice for Noise Vibration Control on Construction and Open Sites or as directed by An Bord Pleanala and Grant of Planning Permission and attached conditions.

Mitigation Measures

- Enforce site working hours and by agreement with the Local Authority
- Main Contractor to fit covers to plant equipment / machinery and operate as per manufacturer's instructions

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- Fit noise reducing equipment to construction vehicles
- Use of electrical mains as opposed to generators where applicable.
- Batch mixing in locations away from nearby residential properties where possible to cause minimum disturbance
- PPE and noise / ear protectors to be worn
- Use of noise equipment monitors at key locations on the Phase 1B site
- Monthly collection of noise collecting data and reporting to the Planning Authority if requested
- Communication with local residents

Control of Vibration

The construction works will be carried out in such a way that the effect of vibration on the adjoining buildings and roads is minimised and does not cause any damage. It is likely that vibration limits will be defined in grant of permission and conditions.

Mitigation Measures

- Minimise use of heavy rock breaking equipment closer than 10m to property boundaries and adjoining buildings
- Minimise heavy truck movements close to existing residential properties
- Use of vibration equipment monitors at key locations on the Phase 1B site
- Monthly collection of vibration collecting data and reporting to Fingal County Council if requested

Control of Dust

The works will be carried out in such a way that the effect of dust on the adjoining dwellings / residents and roads is minimised. The Main Contractor is to implement appropriate controls to suppress dust, odours and other suspended particles in accordance with the conditions of planning permission.

During the construction activities, mobile and fixed heavy equipment may contribute emissions to the atmosphere. Exposed soils and construction activities may lead to dust generation and impact local air quality and affect native fauna local residential amenity.

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Mitigation Measures

- Minimise areas of ground disturbance
- Use of site enclosures / boundaries
- Regular cleaning of site
- Exposed ground surfaces to be sprayed with water
- Exposed stockpiles of soil to be protected
- Haul roads and other trafficable areas to be maintained and hosed down during dry and windy weather
- Trafficable routes to be clearly defined using guide posts to prevent unnecessary vehicular movement onto other areas
- Regular use of road sweeper on approach roadways
- Use of wheel wash system / hosing down for all construction vehicles and machinery exiting the site
- All vehicles to maintain imposed site speed limits
- Maintenance and servicing of all trucks and heavy equipment to minimize fumes
- Trucks transporting loose material to be covered
- Combustible waste material and cleared vegetation shall not be burnt on site
- Use of dust equipment monitors at key locations on the Phase 1B site
- Monthly collection of dust collecting data and reporting to Fingal County Council if requested
- All waste material shall be managed and removed from site in accordance with Waste Management Plan prepared by AWN Consulting

9.0 Construction & Demolition Waste Management Plan

A detailed Construction & Demolition Waste Management Plan is prepared by AWN consulting for the Phase 1B development and is included with the planning application.

Policy and Legislation

The main objectives of the plan are to deliver a sustainable waste management plan for the Phase 1B development and based on the following strategic objectives-

- National Policy: A resource Opportunity- Waste Management Policy in Ireland.
- Regional policy: Eastern- Midlands Region Waste Management Plan 2015-2021.

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The waste management plan is also in accordance with the Fingal Development Plan 2017-2023 which came into existing on March 2017 and sets out a number of objectives of the region waste management plan.

The hierarchy of waste management sets out the guidelines in order of importance as follows:

- Reduction of the amount of waste generated by the construction process.
- Segregation of waste is a key concept that will be implemented during the course of the construction phase of the development to enable in re-use and recycling, wherever appropriate.
- Recycling waste material where feasible, including the use of excess excavations as fill material, recycling of various waste fractions such as metal and packaging etc.

The framework is the guide by which the Main Contractor will manage waste generated on the Phase 1 development. The concept ranges from the most favored to the least favored options, as followed:

- Prevention – This proposes the prevention of generation of waste. The entails as efficient method of management of the construction processes top prevent, where possible, the generation of waste in the first instance.
- Minimisation – Reducing the quantities of waste generated where prevention is not fully possible.
- Energy recovering- waste generated will be segregated for the licensed operators to utilize this method in keeping with the characteristics of the material in question.
- Disposal – By following the hierarchy noted above we will ensure that any disposal will be minimized and managed in a controlled way.

Typical Construction Waste on Site

During the development of phase 1B the contractor shall make an effort to reuse materials where possible. It is generally intended to strip circa 400mm of topsoil from the Phase 1B construction site which will lead to approximately 25,000 m³ of which it is intended to reuse 30%. Spoil from excavations will generate a further 24,000 m³ of which circa 10% will be reused.

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The waste materials from the construction of the outfall as mentioned in Section 5, Storm Water Management Plan will be removed from site, the Contractor shall ensure that all waste material removed from site is tracked with all records being kept on site.

Typical waste that will be generated by the construction works is as follows:

- General site clearance waste.
- Surface water runoff
- Packaging and waste construction materials generated during the course of the construction activities

A full waste management plan for Phase 1B of the development is completed by AWN Consultants. The topics that are covered in the Construction & Demolition Waste Management Plan are:

- Description of Project
- Waste Management
- Estimated Cost of Waste Management
- Training for Waste Manager & Site Crew
- Waste Tracking & Record Responsibility
- Outline Waste Audit Procedures
- Consultant with Relevant Bodies

Tracking and Documentation Procedures for Off Site Waste

The tracking and documentation of off-site waste is detailed in the Construction & Demolition Waste Management Plan prepared by AWN. It states that all waste will be documented prior to leaving site and that all records will be maintained by a nominated project waste manager. The waste project manager will be trained in how to set up and maintain a record keeping system, how to perform an audit and how to establish targets for the waste management on site

Appendix 6 – Summary of predicted impacts on Baldoyle Bay SAC and SPA (attribute and target data extracted from NPWS Conservation Objectives documents)

Baldoyle Bay SAC

Habitat		Mudflats and sandflats not covered by seawater at low tide [1140]	
Attribute	Target	Potential impacts	Predicted impacts
Habitat area	The permanent habitat area is stable or increasing, subject to natural processes. Habitat area was estimated as 409ha using OSi data	Scouring/erosion (uncontrolled discharge of surface water). Habitat loss/loss of function	None. Construction and operational impacts avoided via CEMP, SuDS and no works permitted within Annex 1 habitat. Monitoring by Ecological Clerk of Works (ECoW).
Community distribution	Conserve the following community types in a natural condition: Fine sand dominated by <i>Angulus tenuis</i> community complex; and Estuarine sandy mud with <i>Pygospio elegans</i> and <i>Tubificoides benedii</i> community complex.	Scouring/erosion (uncontrolled discharge of surface water). Habitat loss/loss of function	None. Construction and operational impacts avoided via CEMP, SuDS and no works permitted within Annex 1 habitat. Monitoring by ECoW.

Habitat		Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>) [1330]	
Attribute	Target	Potential impacts	Predicted impacts
Habitat area	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-site mapped: Baldoyle - 11.98ha.	Scouring/erosion (uncontrolled discharge of surface water). Habitat loss/loss of function	None. Construction and operational impacts avoided via CEMP, SuDS and no works permitted within Annex 1 habitat. Monitoring by ECoW.
Habitat distribution	No decline, or change in habitat distribution, subject to natural processes.	Scouring/erosion (uncontrolled discharge of surface water). Habitat loss/loss of function	None. Construction and operational impacts avoided via CEMP, SuDS and no works permitted within Annex 1 habitat.

Habitat	Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) [1330]		
			Monitoring by ECoW.
Physical structure: sediment supply	Maintain natural circulation of sediments and organic matter, without any physical obstructions	Scouring/erosion (uncontrolled discharge of surface water). Sedimentation/pollution.	None. Construction and operational impacts avoided via CEMP, SuDS and no works permitted within Annex 1 habitat. Monitoring by ECoW.
Physical structure: creeks and pans	Maintain/restore creek and pan structure to develop, subject to natural processes, including erosion and succession	Scouring/erosion (uncontrolled discharge of surface water). Sedimentation/pollution.	None. Construction and operational impacts avoided via CEMP, SuDS and no works permitted within Annex 1 habitat. Monitoring by ECoW.
Physical structure: flooding regime	Maintain natural tidal regime	No impact expected.	None.
Vegetation structure: zonation	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Scouring/erosion (uncontrolled discharge of surface water). Sedimentation/pollution.	None. Construction and operational impacts avoided via CEMP, SuDS and no works permitted within Annex 1 habitat. Monitoring by ECoW.
Vegetation structure: vegetation height	Maintain structural variation within sward	No impact expected.	None.
Vegetation structure: vegetation cover	Maintain more than 90% of the area outside of the creeks vegetated	Scouring/erosion (uncontrolled discharge of surface water). Sedimentation/pollution.	None. Construction and operational impacts avoided via CEMP, SuDS and no works permitted within Annex 1 habitat. Monitoring by ECoW.
Vegetation composition: typical species and sub-communities	Maintain range of sub-communities with typical species listed in the Saltmarsh Monitoring Project (McCorry and Ryle, 2009)	Scouring/erosion (uncontrolled discharge of surface water). Sedimentation/pollution.	None. Construction and operational impacts avoided via CEMP, SuDS and no works permitted within Annex 1 habitat. Monitoring by ECoW.
Vegetation structure: negative	No significant expansion of common cordgrass (<i>Spartina anglica</i>),	No impact expected.	None.

Habitat	Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) [1330]		
indicator species- <i>Spartina anglica</i>	with an annual spread of less than 1%		

Habitat	Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410]		
Attribute	Target	Potential impacts	Predicted impacts
Habitat area	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-site mapped: Baldoyle - 2.64ha.	Scouring/erosion (uncontrolled discharge of surface water). Habitat loss/loss of function	None. Construction and operational impacts avoided via CEMP, SuDS and no works permitted within Annex 1 habitat. Monitoring by ECoW.
Habitat distribution	No decline, or change in habitat distribution, subject to natural processes.	Scouring/erosion (uncontrolled discharge of surface water). Habitat loss/loss of function	None. Construction and operational impacts avoided via CEMP, SuDS and no works permitted within Annex 1 habitat. Monitoring by ECoW.
Physical structure: sediment supply	Maintain natural circulation of sediments and organic matter, without any physical obstructions	Scouring/erosion (uncontrolled discharge of surface water). Sedimentation/pollution.	None. Construction and operational impacts avoided via CEMP, SuDS and no works permitted within Annex 1 habitat. Monitoring by ECoW.
Physical structure: creeks and pans	Maintain/restore creek and pan structure to develop, subject to natural processes, including erosion and succession	Scouring/erosion (uncontrolled discharge of surface water). Sedimentation/pollution.	None. Construction and operational impacts avoided via CEMP, SuDS and no works permitted within Annex 1 habitat. Monitoring by ECoW.
Physical structure: flooding regime	Maintain natural tidal regime	No impact expected.	None.
Vegetation structure: zonation	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Scouring/erosion (uncontrolled discharge of surface water). Sedimentation/pollution.	None. Construction and operational impacts avoided via CEMP, SuDS and no works permitted within Annex 1 habitat. Monitoring by ECoW.

Habitat		Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410]	
Vegetation structure: vegetation height	Maintain structural variation within sward	No impact expected.	None.
Vegetation structure: vegetation cover	Maintain more than 90% of the area outside of the creeks vegetated	Scouring/erosion (uncontrolled discharge of surface water). Sedimentation/pollution.	None. Construction and operational impacts avoided via CEMP, SuDS and no works permitted within Annex 1 habitat. Monitoring by ECoW.
Vegetation composition: typical species and sub-communities	Maintain range of sub-communities with typical species listed in the Saltmarsh Monitoring Project (McCorry and Ryle, 2009)	Scouring/erosion (uncontrolled discharge of surface water). Sedimentation/pollution.	None. Construction and operational impacts avoided via CEMP, SuDS and no works permitted within Annex 1 habitat. Monitoring by ECoW.
Vegetation structure: negative indicator species- <i>Spartina anglica</i>	No significant expansion of common cordgrass (<i>Spartina anglica</i>), with an annual spread of less than 1%	No impact expected.	None.

Habitat		Salicornia and other annuals colonizing mud and sand [1310]	
Attribute	Target	Potential impacts	Predicted impacts
Habitat area	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-site mapped: Baldoyle - 0.383ha.	Scouring/erosion (uncontrolled discharge of surface water). Habitat loss/loss of function	None. Construction and operational impacts avoided via CEMP, SuDS and no works permitted within Annex 1 habitat. Monitoring by ECoW.
Habitat distribution	No decline, or change in habitat distribution, subject to natural processes.	Scouring/erosion (uncontrolled discharge of surface water). Habitat loss/loss of function	None. Construction and operational impacts avoided via CEMP, SuDS and no works permitted within Annex 1 habitat. Monitoring by ECoW.
Physical structure: sediment supply	Maintain natural circulation of sediments and organic matter,	Scouring/erosion (uncontrolled discharge of surface water).	None. Construction and operational impacts avoided via

Habitat	Salicornia and other annuals colonizing mud and sand [1310]		
	without any physical obstructions	Sedimentation/pollution.	CEMP, SuDS and no works permitted within Annex 1 habitat. Monitoring by ECoW.
Physical structure: creeks and pans	Maintain/restore creek and pan structure to develop, subject to natural processes, including erosion and succession	Scouring/erosion (uncontrolled discharge of surface water). Sedimentation/pollution.	None. Construction and operational impacts avoided via CEMP, SuDS and no works permitted within Annex 1 habitat. Monitoring by ECoW.
Physical structure: flooding regime	Maintain natural tidal regime	No impact expected.	None.
Vegetation structure: zonation	Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	Scouring/erosion (uncontrolled discharge of surface water). Sedimentation/pollution.	None. Construction and operational impacts avoided via CEMP, SuDS and no works permitted within Annex 1 habitat. Monitoring by ECoW.
Vegetation structure: vegetation height	Maintain structural variation within sward	No impact expected.	None.
Vegetation structure: vegetation cover	Maintain more than 90% of the area outside of the creeks vegetated	Scouring/erosion (uncontrolled discharge of surface water). Sedimentation/pollution.	None. Construction and operational impacts avoided via CEMP, SuDS and no works permitted within Annex 1 habitat. Monitoring by ECoW.
Vegetation composition: typical species and sub-communities	Maintain the presence of species-poor communities with typical species listed in the Saltmarsh Monitoring Project (McCorry and Ryle, 2009)	Scouring/erosion (uncontrolled discharge of surface water). Sedimentation/pollution.	None. Construction and operational impacts avoided via CEMP, SuDS and no works permitted within Annex 1 habitat. Monitoring by ECoW.
Vegetation structure: negative indicator species- <i>Spartina anglica</i>	No significant expansion of common cordgrass (<i>Spartina anglica</i>), with an annual	No impact expected.	None.

Habitat	Salicornia and other annuals colonizing mud and sand [1310]		
	spread of less than 1%		

Baldoyle Bay SPA

Water bird species			
Attribute	Target	Potential impacts	Predicted impacts
Population trend	Long term population trend stable or increasing	Population change (reduction) arising due to disturbance, reduction in feeding habitat or reduction in habitat quality.	<p>None. Significant measures have already been put in place under Phase 1A, in compliance with the LAP requirements (e.g. GI 12). No loss of suitable habitat will take place.</p> <p>Works related to the regional wetland and outfall to Baldoyle Bay will be restricted to outside the bird overwintering period.</p> <p>Full implementation of CEMP and monitoring by ECoW.</p>
Distribution	No significant decrease in the range, timing and intensity of use of areas by light-bellied brent goose, other than that occurring from natural patterns of variation	Population distribution arising due to disturbance, reduction in feeding habitat or reduction in habitat quality.	<p>None. Significant measures have already been put in place under Phase 1A, in compliance with the LAP requirements (e.g. GI 12). No loss of suitable habitat will take place.</p> <p>Works related to the regional wetland and outfall to Baldoyle Bay will be restricted to outside the bird overwintering period.</p> <p>Full implementation of CEMP and monitoring by ECoW.</p>

Wetland habitat			
Attribute	Target	Potential impacts	Predicted impacts
Habitat area	The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 263ha, other than that	Reduction in wetland habitat quality due to sedimentation, pollution or changes in water flows.	<p>None. Construction and operational impacts avoided via CEMP, SuDS.</p> <p>Monitoring by ECoW.</p>

Wetland habitat			
	occurring from natural patterns of variation		

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