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**Appendix 5.4**  
**Marino Point Winter Bird**  
**Survey 2018/19 Report**

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Appendix 5.4

## Marino Point Winter Bird Survey 2018/19 Report



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## 1. INTRODUCTION

Malachy Walsh and Partners (MWP) commissioned Wildeye wildlife surveyors to conduct wintering bird surveys on a monthly basis between November and March, inclusive, during the wintering bird period of 2018/2019. This report summarises the findings of the survey data gathered and provides an appraisal of the potential impacts of the proposed site demolition, site infrastructure improvements, and utility upgrade works at the Belvelly Port Facility in Marino Point on Great Island in County Cork, on birds utilising the development site and the coastal areas adjacent to it.

The information in this report was used to help determine the impacts on bird populations and also informed the conclusions of the Environmental Impact Assessment Report (EIAR) and Natura Impact Statement (NIS) report for the proposed development and any proposed future development works at Marino Point.

## 2. PROJECT BACKGROUND

Marino Point is a small peninsula located on Great Island, County Cork. The site is bound by Lough Mahon, which forms part of the greater Cork Harbour, to the north, west and south. Passage West which lies to the west of the site on the opposite side of the harbour is approximately 1km from the centre of the site. The immediate surrounding area is lightly populated, while Passage West currently has a population of approximately 6,000 people. The northern coastal boundary of the site is adjacent to intertidal mudflats and sandflats. The eastern boundary of the site is formed by the Cork to Cobh railway and R624 Cork-Cobh regional road. The nearest significant town on the same side of the harbour is Cobh which lies approximately 5km south-east of the site. The site is located at Irish Grid Reference W 177535 E, 069595 N on Great Island in Greater Cork Harbour.

The Belvelly Marino Development Company (BMDC) acquired the former Irish Fertiliser Industries (IFI) site at Marino Point on Great Island, Co. Cork in 2017 with a view to redeveloping the site in line with the existing port-related industrial zoning objective for Marino Point. BMDC is a Public Private Partnership between Lanber Holdings and the Port of Cork Company. The site (referred to herein as the Belvelly Port Facility) contains several derelict IFI buildings and structures. The existing infrastructure and utilities are in poor condition and not fit for purpose and require upgrading to stabilise existing activities on site and provide capacity for future development proposals.

The proposed development involves demolition, site infrastructure and utility upgrade works at the Belvelly Port Facility. The proposed works will clear the site of redundant and derelict buildings and structures, and provide infrastructure and utility services to comply with current engineering standards and environmental protection requirements.

### 3. DESKTOP REVIEW

A desktop review was carried out to identify designated Special Protection Areas (SPA's) in the surrounding landscape and any previous records of water birds (waders and wildfowl) from the study area and surrounding region. From the information identified in the desktop review and a site inspection, it was concluded that winter bird counts would be required to accurately assess any potential ecological impacts on birds from the proposed development.

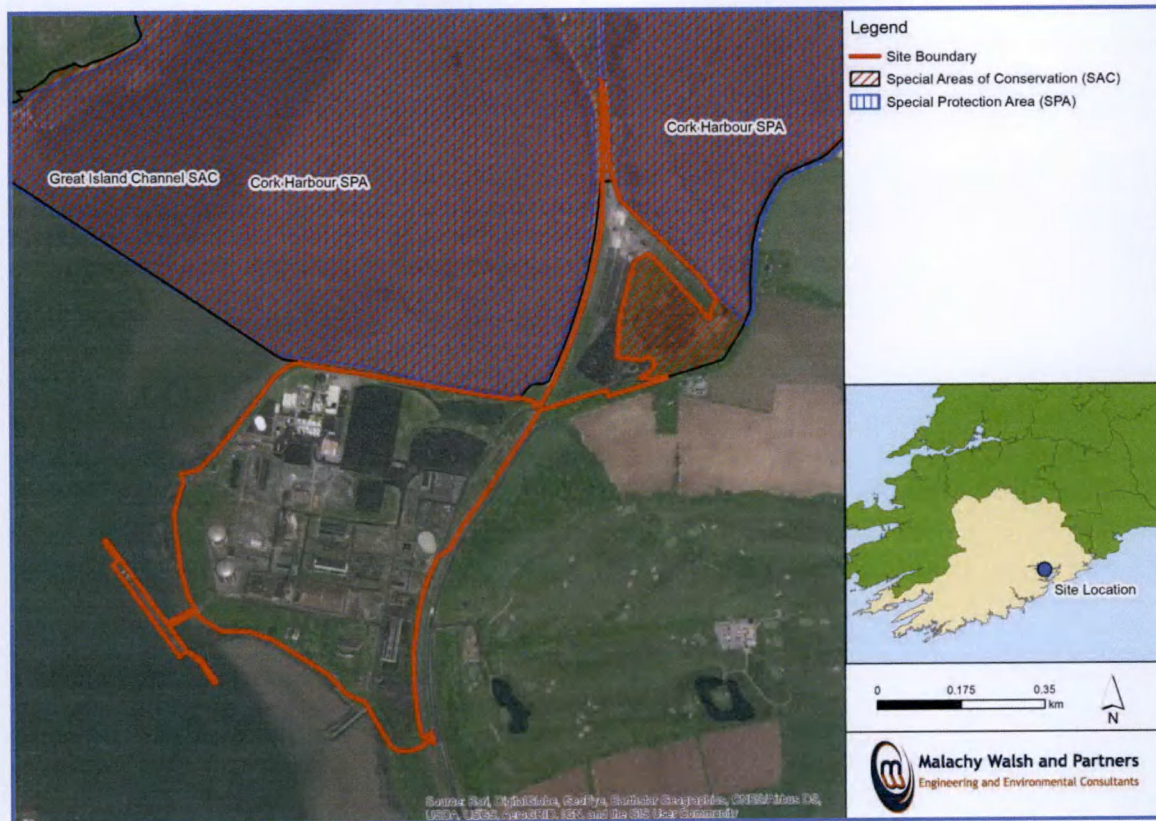
#### 3.1 DESIGNATED SITES

##### 3.1.1 Special Protection Areas (SPAs)

Ireland is required under the terms of the EU Birds Directive (2009/147/EC) to designate Special Protection Areas (SPAs) for the protection of endangered species of wild birds. Sites that meet any of the following criteria may be selected as SPAs:

- A site regularly supporting 20,000 waterbirds or 10,000 pairs of seabirds;
- A site regularly supporting 1% or more of the all-Ireland population of an Annex I species;
- A site regularly supporting 1% or more of the biogeographical population of a migratory species;
- A site that is one of the 'n' most suitable sites in Ireland for an Annex I species or a migratory species (where 'n' is a variable which is related to the proportion of the total biogeographic population of a species held by Ireland).

The closest Special Protection Area for birds is the Cork Harbour SPA (Site code 004030) which lies adjacent to the Belvelly Port Facility site on its northern shore and the land parcel (northern annex) in the northeast on its north-eastern shore (**Figure 1**).



**Figure 1 Proposed development site in relation to adjoining Natura 2000 sites  
i.e. Great Island Channel SAC & Cork Harbour SPA**

Cork Harbour is a large, sheltered bay system, with several river estuaries, principally those of the Rivers Lee, Douglas, Owenboy and Owennacurra. The Belvelly Port Facility site lies immediately to the south of the SPA. The SPA site comprises of a number of the main intertidal areas of Cork Harbour, including all of the North Channel, the Douglas River Estuary, inner Lough Mahon, Monkstown Creek, Lough Beg, the Owenboy River Estuary, Whitegate Bay and the Rostellan and Poul nabibe inlets. Cork Harbour SPA is designated for twenty three predominantly wintering species of bird.

The site is of important conservation interest for holding an assemblage of over 20,000 wintering waterbirds. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds. Cork Harbour has a nationally important breeding colony of Common Tern (3-year mean of 69 pairs for the period 1998-2000, with a maximum of 102 pairs in 1995). The birds have nested in Cork Harbour since about 1970 and, since 1983, on various artificial structures, notably derelict steel barges and the roof of the Martello Tower to the north of the site. The birds are monitored annually and the chicks are ringed<sup>1</sup>. Common tern breeds on the coastal areas, and inland on islets in freshwater lakes.

<sup>1</sup>[https://www.npws.ie/sites/default/files/publications/pdf/Cork%20Harbour%20SPA%20\(004030\)%20Conservation%20objectives%20supporting%20document%20-%20\[Version%201\].pdf](https://www.npws.ie/sites/default/files/publications/pdf/Cork%20Harbour%20SPA%20(004030)%20Conservation%20objectives%20supporting%20document%20-%20[Version%201].pdf)



**Table 1** below lists the Species of Conservation Interest (SCI) of the Cork Harbour SPA along with the conservation objective for each species.

**Table 1 Species of Conservation Interest (SCI) for the Cork Harbour SPA**

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

To acknowledge the importance of Ireland's wetlands to wintering waterbirds, "Wetland and Waterbirds" may be included as a Special Conservation Interest for some SPAs that have been designated for wintering waterbirds and that contain a wetland site of significant importance to one or more of the species of Special Conservation Interest. Thus, a further objective is to maintain or restore the favourable conservation condition of the wetland habitat within the Cork Harbour SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.

The favourable conservation conditions of these SCIs in the Cork Harbour SPA are defined by various attributes and targets, which are shown in **Table 2**.

**Table 2 Attributes and targets for the conservation objectives for the wintering waterbirds and breeding Common Tern**

Species/Habitats	Attribute	Measure	Target
Little Grebe	Population trend	Percentage change	Long term population trend stable or increasing
Great Crested Grebe			
Cormorant	Distribution	Range, timing	No significant decrease in the

Species/Habitats	Attribute	Measure	Target
Grey Heron Shelduck Wigeon Teal Pintail Shoveler Red-breasted Merganser Oystercatcher Golden Plover Grey Plover Lapwing Dunlin Black-tailed Godwit Bar-tailed Godwit Curlew Redshank Black-headed Gull Common Gull Lesser Black-backed Gull		and intensity of use of areas	range, timing or intensity of use of areas by each species, other than that occurring from natural patterns of variation
Common Tern	Breeding population abundance: apparently occupied nests (AONs)	Number	No significant decline
	Productivity rate: fledged young per breeding pair	Mean number	No significant decline
	Distribution: breeding colonies	Number; location; area (hectares)	No significant decline
	Prey biomass available	Kilogrammes	No significant decline
	Barriers to connectivity	Number; location; shape; area (hectares)	No significant increase
	Disturbance at the breeding site	Level of impact	Human activities should occur at levels that do not adversely affect the breeding common tern population
	Habitat area	Hectares	The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 2,587 hectares, other than that occurring from natural patterns of variation

### 3.1.2 Ramsar Sites

The Ramsar Convention on Wetlands of International Importance, especially as Waterfowl Habitat, is an international treaty that was established for the conservation and sustainable use of wetlands. The Ramsar Convention was ratified by Ireland in 1984 and came into force for Ireland on 15 March 1985. Ireland presently has 45 sites designated as Wetlands of International Importance, with a surface area of 66,994 hectares.

Within its 1,436 ha, Cork Harbour Ramsar site (site no. 837) supports various breeding water birds, internationally important numbers of wintering and spring staging water birds, and provides important feeding areas for waders<sup>2</sup>. The site comprises two sections one of which is located in the north east corner of the harbour encompassing the area from Little Island to Midleton, with its southern boundary being formed by Great Island; the other is in the west of the harbour encompassing the intertidal flats of Lough Mahon. The site is a wetland of international importance for its wintering populations of black-tailed godwit, curlew and redshank and its spring migration numbers of whimbrel; while twelve species occur at nationally important levels<sup>3</sup>. The Ramsar site overlaps with Cork Harbour SPA and IBA sites and, with the exception of whimbrel, the species identified in site documentation<sup>6</sup> as occurring in the Ramsar site in important numbers are included as SCI species for which the SPA site is selected.

### 3.1.3 Important Bird Areas

The Important Bird Areas (IBA) Programme is a BirdLife International initiative aimed at identifying and protecting a network of critical sites for the conservation of the world's birds. There are 156 IBA's in Ireland including 140 in the Republic of Ireland and 16 in Northern Ireland, 122 of which support wintering water birds. These sites are important for breeding seabirds and for wintering wildfowl.

5,950 ha of the Cork Harbour waters are designated as an IBA (Site Code: IE088) for the conservation of important wetland, breeding and migratory bird populations. Cork Harbour regularly supports over 20,000 waterfowl which includes: various breeding water birds, internationally important numbers of wintering and spring staging water birds, and provides important feeding areas for waders. It is one of the most important sites in Ireland for breeding tern and for wintering great crested grebe, red-breasted merganser, oystercatcher, and lapwing, as well as for staging whimbrel. Several other species also occur in numbers of national importance, including cormorant, shelduck, wigeon, teal and golden plover<sup>4</sup>. The IBA overlaps with Cork Harbour SPA and Ramsar sites<sup>5</sup> and, with the exception of whimbrel, the species occurring in the IBA site in important numbers are included as SCI species for which the SPA site is selected.

### 3.1.4 Wading Birds, Wildfowl & Gulls

Cork Harbour is of major ornithological significance, being of international importance both for the total numbers of wintering birds (i.e. > 20,000, for which it is amongst the top five sites in the country) and also for its populations of Black-tailed Godwit and Redshank. In addition, it supports nationally important wintering populations of 22 species, as well as a nationally important breeding colony of Common Tern. It is an important site for gulls in winter and autumn, especially Common Gull and Lesser Black-backed Gull.

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<sup>2</sup> <https://www.ramsar.org/wetland/ireland>

<sup>3</sup> <https://rsis.ramsar.org/RISapp/files/RISrep/IE837RIS.pdf>

<sup>4</sup> Except for whimbrel all of the birds listed in this paragraph are Special Conservation Interest species for the SPA

<sup>5</sup> <http://datazone.birdlife.org/site/factsheet/cork-harbour-iba-ireland/text>

Several of the species which occur regularly are listed on Annex I of the E.U. Birds Directive, i.e. Whooper Swan, Little Egret, Golden Plover, Bar-tailed Godwit, Ruff, Mediterranean Gull and Common Tern. The site provides both feeding and roosting sites for the various bird species that use it. Cork Harbour is also a Ramsar Convention site and part of Cork Harbour SPA is a Wildfowl Sanctuary.

### 3.2 PREVIOUS (RELEVANT) STUDIES IDENTIFIED

#### 3.2.1 Review of the Irish Wetland Bird Survey (I-WeBS) & Waterbird Survey Programme

Most species which occur in Ireland migrate from the north and northwest (principally Canada, Greenland and Iceland) or from the northeast (northern continental Europe, including Scandinavia, Russia and Siberia), moving south to winter predominantly in west and northwest Europe and west Africa (Wetlands International, 2006, Wernham et al., 2002). Estuaries and other wetlands of north-west Europe support vast numbers of these migratory wading birds and wildfowl each winter. These wetland habitats along with the mild climate, provide ample feeding throughout the winter period, particularly when many other parts of northwest Europe are frozen over. It is the high densities of benthic macroinvertebrates and easy access which are the main attraction of these wetland sites. Disturbance free roosting and resting areas are additional important ecological requirements. It is a combination of these factors which make Ireland particularly attractive for wintering waterbirds.

The Irish Wetland Bird Survey (I-WeBS) is the scheme that monitors wintering waterbirds in Ireland. The survey runs from September to March each winter. Wetlands of all types and sizes are monitored, including estuaries, coastlines, bays, rivers, turloughs, lakes, streams and flooded fields. I-WeBS is traditionally a high-tide survey and at large, complex estuarine sites with extensive intertidal areas that require some time to cover, counts are typically made within three hours either side of the high tide.

Non-breeding waterbirds are counted at Cork Harbour each winter as part of the Irish Wetland Bird Survey (I-WeBS). The dataset spans the period 1994/95 to 2015/16 and a total of 21 count subsites, covering some 2,961 ha have been monitored regularly.

A review of the Irish Wetland Bird Survey (I-WeBS) data shows that the area directly north of the Belvelly Port Facility site (Subsite: 0L426 Carrigrenan - Great Island & Railway) and northeast of the northern annex (Subsite: 0L425 Belvelly Bridge – Railway) is monitored as part of the I-WeBS scheme. Refer to **Table 4** and **Figure 2** below for reference. The transitional water and adjoining mudflat habitats to the south and southwest of the Belvelly Port Facility site are currently not monitored.

A review of the Irish Wetland Bird Survey (I-WeBS) data for the periods 2012/2013 to 2015/2016 for the subsites 0L425 and 0L426 shows that a small number of species were noted to be of national importance based on both mean and peak values. Refer to **Table 3** below.

**Table 3 Irish Wetland Bird Survey (I-WeBS) data for the periods 2012-2016 for the subsites 0L425 and 0L426, which recorded species above the threshold for the national 1% of the all-Ireland population, based on the most recent estimates for Ireland, namely Crowe and Holt (2013).**

Subsite: : 0L426 Carrigrenan - Great Island & Railway				
Species	1% National	1% International	Mean (12/13 – 15/16)	Peak (12/13 – 15/16)
Great Crested Grebe	30	6,300	26	59*
Grey Plover	30	2,000	16	38*
Dunlin	460	13,300	813*	2,850*
Subsite: 0L425 Belvelly Bridge – Railway				
Species	1% National	1% International	Mean (12/13 – 15/16)	Peak (12/13 – 15/16)
Shelduck	100	2,500	365*	527*
Gadwall	20	1,200	9	36*
Grey Heron	25	5,000	20	46*
Black-tailed Godwit	200	1,100	149	275*
Greenshank	20	3,300	23*	29*
Redshank	240	2,400	378*	538*

\* Above 1% of the all-Ireland population, based on the most recent estimates for Ireland, namely Crowe and Holt (2013)

Of the species recorded all but Gadwall are listed as special conservation interest of the Cork Harbour SPA. Based on the subsite location, as detailed above, the majority of species recorded are located northeast of the northern annex. Of the species noted as occurring at nationally important levels north of the Belvelly Site i.e. Great Crested Grebe, Grey Plover and Dunlin, only two rely on mudflat habitats in relation to foraging. Great Crested Grebe is a piscivorous species.

### 3.2.2 NPWS Winter Bird Survey 2010/2011<sup>6</sup>

During 2010/2011 a waterbird survey programme was conducted by the NPWS within Cork Harbour. This waterbird survey programme was designed to investigate how waterbirds are distributed across coastal wetland sites during the low tide period. The surveys ran alongside and were complementary to the Irish Wetland Bird Survey (I-WeBS). This survey consisted of four low tide counts (October, November and December 2010 and February 2011) and one high tide count (January 2011), where waterbirds were counted within a series of 73 count subsites within the SPA. Subsite locations can be seen in **Figure 2** below and Appendix 6 of Cork Harbour Special Protection Area (Site Code 4030) Conservation Objectives Supporting Document Version 1.

The behaviour of waterbirds during counts was attributed to one of two categories (foraging or roosting/other) while the position of birds was recorded in relation to one of four broad habitat types; Intertidal (area between mean high water and mean low water), Subtidal (area that lies below mean low water), Supratidal and Terrestrial. In addition to the main survey programme described above, a high tide roost survey was undertaken on the 29<sup>th</sup> and 30<sup>th</sup> of November 2010. During this

<sup>6</sup>[https://www.npws.ie/sites/default/files/publications/pdf/Cork%20Harbour%20SPA%20\(004030\)%20Conservation%20objectives%20supporting%20document%20-%20%5BVersion%201%5D.pdf](https://www.npws.ie/sites/default/files/publications/pdf/Cork%20Harbour%20SPA%20(004030)%20Conservation%20objectives%20supporting%20document%20-%20%5BVersion%201%5D.pdf)

survey, waterbird roost sites were located, species and numbers of waterbirds counted and the position of roosts marked onto field maps.

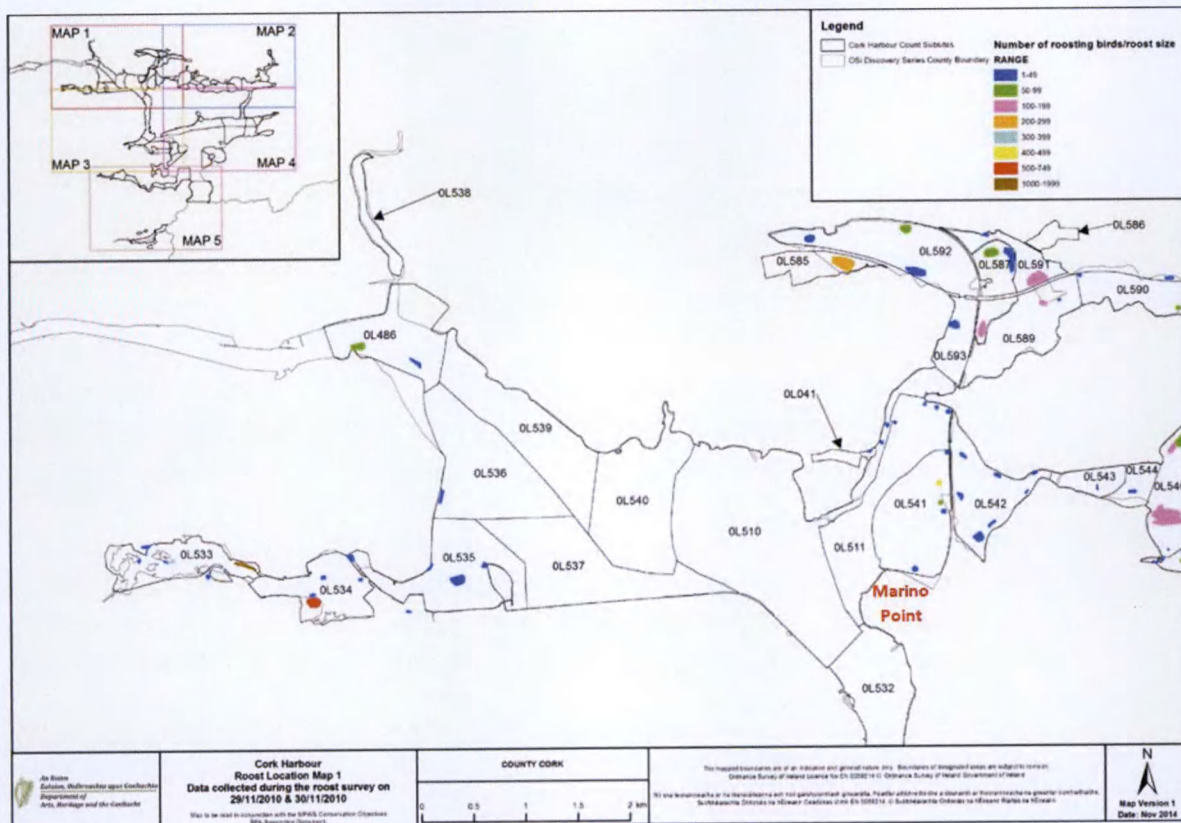


Figure 2 Roost location map in relation to Marino Point (NPWS, 2014)

A total of 58 waterbird species were recorded during the 2010/11 survey programme at Cork Harbour, which includes all species listed as conservation interests for the Cork Harbour SPA. The following lists any records of note in relation to the subsites located adjacent to the Belvelly Port Facility site at Marino Point i.e. Martello west to Carrigrenan (OL541), Belvelly Br. West (OL542), and Marino Pt to Carrigrenan Pt (OL511).

- Shelduck  
259 Shelduck roosted subtidally during the high tide survey in January 2011. Peak numbers were recorded within the subsite Belvelly Br. West (OL542) with a max 73 Shelduck noted.
- Wigeon  
During the low tide surveys, subtidal roosting/other occurred with most regularity (two or more low tide surveys) within a number of subsites, one of which was the Martello west to Carrigrenan (OL541) subsite.
- Little Grebe  
Irregular and often once-off records were made of subtidally roosting/other individuals during low tide surveys. The peak number recorded was 17 at subsite Marino Pt to Carrigrenan Pt (OL511) during the December 2010 survey.

- Great Crested Grebe  
16 Great Crested Grebes were recorded in roosting/other behaviour during the high tide survey. The largest numbers (five individuals) were positioned in subsite Martello west to Carrigrenan (OL541)
- Cormorant  
Subsite Martello west to Carrigrenan (OL541) was noted for recording numbers ranked as 'high' in all four low tide surveys, with roosting/other behaviour commonly seen.
- Oystercatcher  
Oystercatchers roosted supratidally during the high tide survey; the largest number (91) was recorded on shingle/gravel in subsite Martello west to Carrigrenan (OL541). The November 2010 roost survey recorded roosting Oystercatchers in 27 subsites overall. The largest single roost was in Martello west to Carrigrenan (OL541) where the birds roosted in the north of the subsite in the same position as the flock recorded during the high tide survey.
- Grey Plover  
The peak intertidal foraging density was 1.5 Grey Plover ha<sup>-1</sup> recorded for OL511 Marino Pt to Carrigrenan Pt (OL511) in December 2010. This was the only subsite to record a density of over 1 Grey Plover ha<sup>-1</sup>. The whole site average intertidal foraging density was 0.02 Grey Plover ha<sup>-1</sup>.
- Dunlin  
Subsite Martello west to Carrigrenan (OL541) was notable for supporting numbers ranked as 'high' on at least two survey occasions for foraging Dunlin.  
  
An additional high roost survey record (counted outside of the allotted time for the roost survey) noted 1,850 Dunlin roosting in the north of subsite Marino Pt to Carrigrenan Pt (OL511) on shingle/gravel.
- Redshank  
Subsite Belvelly Br. West (OL542) recorded 64 roosting individuals during the high tide survey.

### 3.2.3 Port of Cork Bird Surveys: Report on the Winter 2012 / 2013 Bird Survey at Marino Point (RPS, 2013)

As part of a report into the future development of Marino Point, ornithological staff from RPS and Cork Ecology (subcontracted to RPS) conducted a winter bird survey during the winter of 2012 / 2013. The objectives of the study were as follows:

- To examine the pattern of usage by birds of marine, intertidal and adjacent terrestrial areas in the vicinity of Marino Point, Cork Harbour, during the period November 2012 to February 2013;
- To identify locations of key importance to birds at this time of year; and

- To generate data which can be used for possible forthcoming impact assessments (Environmental Impact Assessment and Appropriate Assessment) for any proposed future development works at Marino Point.

The study area comprised all the intertidal areas of shoreline and areas of open water that lie adjacent to Marino Point. A total of ten counts were conducted, five at high tide and five at low tide, each covering the entire study area.

This survey found that in general, the intertidal areas within 200m of the shoreline of Marino Point did not appear to be of great importance to feeding birds at low tide. The area to the north of Marino that is located within the SPA boundary is of importance within the broader context of Cork Harbour to feeding Shelduck, Grey Plover, Dunlin and Black-headed Gull, and to a lesser extent for other waders including Curlew, Redshank and Oystercatcher.

Only two high tide roosting areas were noted to be areas of importance to wintering birds at high tide in the vicinity of Marino Point i.e. Martello Tower roost and the Jetty, Dolphin and Pier roost.

By far the most important roosting area for birds was located north of the Belvelly Port Facility site in the area around the Martello Tower, particularly the land spit to the north which was noted to be one of the most important high tide roosts in Cork Harbour. This result corresponded to that found by the NPWS during the high tide roost counts in 2010, see **Figure 2** above. The spit to the north of the Martello Tower produced high counts of roosting birds which included up to 2,000 Dunlin, 135 Oystercatcher, 102 Shelduck, 25 Bar-tailed Godwit and 24 Curlew. Small numbers of Cormorant, Grey Plover, Ringed Plover, Knot, Greenshank, Redshank, Black-tailed Godwit, Turnstone and gulls, including up to 208 Black-headed Gulls, were also recorded using the roost.

Both the barges to the west of the Martello Tower and the saltmarsh to the east of the railway track and the east-facing embankment of the railway track to the east of the Martello Tower were also considered important for roosting Redshank, Curlew, Black-tailed Godwit and Teal.

To the southwest of Belvelly Port Facility site a second roosting area was noted. This comprised of three separate structures. The large jetty was noted to support moderate numbers of Cormorant, but was primarily utilized by gull species i.e. Black-headed Gull, Common Gull and Great Black-backed Gull. A few Shags were also recorded. The birds were recorded perching on the handrails, walkways and other structures at both the northern and southern ends of the jetty. The mooring dolphin to the southeast of the jetty was noted to support moderate numbers of primarily Cormorant with a few Shags and Grey Herons recorded. The stone pier adjacent to the dolphin also supports moderate numbers of Cormorant, Oystercatcher and Curlew with a few Greenshank, Redshank and Black-tailed Godwit noted on occasions. During site visits conducted by Wildeye in 2018 and 2019, it was noted that both the mooring dolphin and stone pier were primarily utilized by cormorant with gulls utilising the jetty.

Overall, it was concluded that low numbers of SCI species utilize the intertidal mudflats that are within the SPA and that are also in relatively close proximity (within 200m), of the shoreline at the Belvelly Port Facility site. It is within this 200m zone that birds are potentially the most susceptible to



disturbance. Results show that areas further north, located 200m from the shoreline of Marino at its closest point are of much greater importance.

Therefore, whilst any noisy or visually intrusive activity at the Belvelly Port Facility site is likely to result in a degree of disturbance to birds, it is not considered likely, based upon the findings of the survey, that significant numbers of birds are likely to be disturbed or displaced from feeding areas or roosting areas to the north of Marino during the winter period.

## 4. WINTER BIRD SURVEY 2018/2019

### 4.1 METHODOLOGY

Counts of wintering birds at the Marino Point site and wider area were commissioned in November 2018 by Malachy Walsh & Partners, and all field surveys were conducted by Mr. Ciarán Cronin of Wildeye.

6 counts were completed in the winter of 2018/19 between late November 2018 and March 2019 inc. Counts were monthly over those 5 months, with an extra count inserted in the Nov/Dec period to help establish the situation on site quickly.

A further 4 counts were conducted in 2019 between July and October 2019 with aim, over all surveys, of covering the main period of wader occurrence from July to March. This extends beyond the standard I-WeBS (national waterbird census) count period of September to March, with a view to detecting the first arrival of waders returning in July.

Counts were separated into Low Water and High Water counts, the aim being to monitor the numbers, distribution and major activity of waders and waterbirds around the site at these times. Count dates and times are shown in **Appendix 1**.

The survey locations were based on information gathered during the desktop review, original site walkover and the location of the proposed development works. Boundaries of the count areas were selected primarily to delineate patches of relatively homogenous habitat within the study area in order to compare bird usage of these habitats and spatial areas; but were also selected to be easily perceived by the observer. This was done by use of sight-lines to prominent landmarks such as permanent marker buoys, coastal features and features on the horizon.

As per best practice and having regard to the precautionary principle, all water birds were regarded as target species for the purposes of this assessment. Waterbirds are defined as “birds that are ecologically dependent on wetlands” (Ramsar Convention, 1971) which are a diverse group that includes divers, grebes, swans, geese and ducks, gulls, terns and wading birds.

#### Low Water Counts

Low water counts broadly followed the count methodology used in the national IWeBS surveys. Counts were conducted within 3 hours either side of Low Water. IWeBS recommend completing all counts within 3 hours but this was not possible on site. However, it was generally possible to count

the primary areas from Belvelly to Little Island within 3 hours, and this area overlaps closely with the IWeBS count areas. Other areas, including Monkstown Creek, were counted in the remaining time. Counts were only conducted when conditions were suitable so count accuracy was maintained.

The count areas extended to cover areas of open water and mud, to approximately 1km from the site (or obvious land border). This included the area from Belvelly Bridge in the north, across to Little Island/Carrigenan Point, the outer reaches of Lough Mahon and through the channel at Passage West. The count area was extended southwards to include the important feeding areas at Monkstown Creek. The overall area was subdivided into 7 sectors to aid counting and recording. These sectors are detailed in **Table 4** and shown in **Figure 3** below. Count Locations are shown in **Appendix 2** below.

Within each sector, birds were recorded in discreet subsectors, defined on the day as containing 'pockets' of birds, with distinct flocks marked separately.

Birds within approximately 100m of the site in each sector were enumerated separately to give an indication of numbers of birds which may be at increased risk of disturbance.

Birds were recorded as either resting (r) or feeding (f). Flying birds were only recorded if they passed the site without landing, otherwise they were recorded either where they took off or landed.

Notes were made of significant flocks flying out of or into the area in order to assist with avoiding double counting.

The internal parts of the main site were not counted specifically during low water counts as the site was not expected to contain any significant numbers of waterbirds at low water (this was evidenced during other work on site).

Counts were conducted by driving or walking between the main vantage points, in order to gain maximum viewing potential, and counting sectors with as few vantage points as possible to reduce the potential for double counting.

#### High Water Counts

High water counts focused on the main development site and immediate surrounds, with a view to recording roosting birds displaced by the high tide.

The High Water count areas are shown on **Figure 4**. The main site was termed 'H-main' and was a composite of 12 areas identified in initial site drawings but amalgamated for count purposes. Areas H13 – H16 were numbered consecutively from there. Areas H-main and H13 were specifically surveyed on each occasion, but areas H14 – H16 were only counted from within the main site.

Waders and waterbirds were recorded as either resting (r) or feeding (f). Flying birds were only recorded if they passed the site without landing, otherwise they were recorded either where they took off or landed.

The main site was walked, and all significant habitats on site approached within 100m. We were not aiming for an accurate census of the entire site, but rather to identify all bird species on site and achieve indicative numbers.

**Table 4 Locations of low water bird counts**

Location code	Location Description
L1	Mudflats northeast of northern annex
L2	Mudflats and open water north of main site including channel between Foaty Island and Carrigrenan Point
L3	West of main site including main channel at Lough Mahon
L4	South of main site including main channel with intertidal mudflats in the northeast corner
L5	Main channel along West Passage
L6	Main channel at Monkstown
L7	Intertidal mudflats at Monkstown Creek



Figure 3 Low water bird count areas

High tide roost counts were also undertaken monthly within the main site and the northern annex, at the intertidal mudflats to the south and north of the main site, and to the northeast of the northern annex. However, not all sites were specifically surveyed on each visit. Refer to **Table 5** and **Figure 4**.

Table 5 Locations of high water bird counts

Location code	Location Description
H (H1-H7 & H9-H12)	Main site
H8	Northern annexe
H13	South of main site
H14	Northeast of northern annexe
H15	North of main site
H16	East of main site and south east of northern annex



Figure 4 High water bird count locations

## 5. RESULTS

It is important to note that waterbird counts represent a 'snapshot' of bird numbers during a count session, so in general and taking into account all potential sources of error, resulting data are regarded to be underestimates of population size.

A total of 71 species were recorded during the winter survey period (2018/2019). The most numerous group was the passerines with 26 species followed by the waders with 15 species. The groups with the least species were the Auks with three species followed by Grebes, Pigeons and Rails and Crakes which all has two species recorded. The only species recorded breeding was Great-crested Grebe in the month of December 2018 at the H15 site.

Species of wintering waterbirds recorded during the surveys, along with mean and peak abundance are shown in **Appendix 3** of this report.

Forty-five waterbird species in total were recorded within the survey areas during the winterbird survey period. Only one Special Protection Area (Cork Harbour SPA, Site Code 004030) is deemed relevant to the proposed works. The qualifying interests for Cork Harbour SPA are shown in **Table 1** together with the conservation objectives for each species. A total of twenty species listed as qualifying interests for the Cork Harbour SPA were recorded, namely, Cormorant, Oystercatcher, Curlew, Redshank, Red-breasted Merganser, Bar-tailed Godwit, Black-tailed Godwit, Dunlin, Grey Plover, Grey Heron, Lapwing, Shelduck, Wigeon, Teal, Shoveler, Great Crested Grebe, Little Grebe, Black-headed Gull, Common Gull and Lesser Black-backed Gull.

Six Annex I bird species were recorded during the survey period i.e. Mediterranean Gull, Bar-tailed Godwit, Kingfisher, Dunlin, Little Egret and Red-throated Diver.

**Table 6 & 7** below shows the max peak count of each species recorded during both low and high tide surveys as a percentage, in relation to the mean values obtained for Cork harbour over a 5-year period between 2012 – 2016.

**Figure 5** shows the High tide roost locations including total bird counts over the 6 monthly survey period for winter 2018-19.

**Table 6 Peak Counts (Low Tide) of Species of Conservation Interest for each of the Study Areas in relation to the I-WeBS Five-Year-Means for Cork Harbour as a Whole.**

Species	I-WeBS 5 yr. Mean Cork Harbour		L1	L2	L3	L4	L5	L6	L7	
	Peak	%	Peak	%	Peak	%	Peak	%	Peak	%
Bar-tailed Godwit	1	0%	6	2%	0	0%	0	0%	29	10%
Black-headed Gull	252	7%	713	21%	169	5%	210	6%	56	2%
Black-tailed Godwit	126	4%	121	4%	0	0%	25	1%	10	0%
Cormorant	17	5%	60	18%	7	2%	39	12%	3	1%
Common Gull	13	4%	57	19%	17	6%	97	32%	25	8%
Curllew	30	2%	72	5%	0	0%	9	1%	0	0%
Dunlin	1129*	26%	985*	23%	0	0%	0	0%	0	0%
Great-crested Grebe	0	0%	18	17%	17	16%	0	0%	0	0%
Grey Plover	4	14%	19	66%	0	0%	0	0%	0	0%
Grey Heron	4	5%	17	21%	2	2%	3	4%	0	0%
Lapwing	58	3%	26	1%	0	0%	0	0%	0	0%
Lesser Black-backed Gull	10	8%	75	56%	0	0%	4	3%	0	0%
Little Grebe	8	11%	3	4%	0	0%	0	0%	0	0%
Oystercatcher	68	4%	109	7%	0	0%	16	1%	0	0%
Redshank	100	6%	84	5%	0	0%	8	1%	0	0%
Red-breasted Merganser	6	9%	15	23%	0	0%	0	0%	0	0%
Shelduck	36	3%	99	9%	0	0%	8	1%	4	0%
Shoveler	2	9%	0	0%	0	0%	0	0%	0	0%
Teal	117	10%	79	6%	0	0%	38	3%	0	0%
Wigeon	34	2%	61	4%	38	3%	8	1%	0	0%

\* Nationally Important Numbers

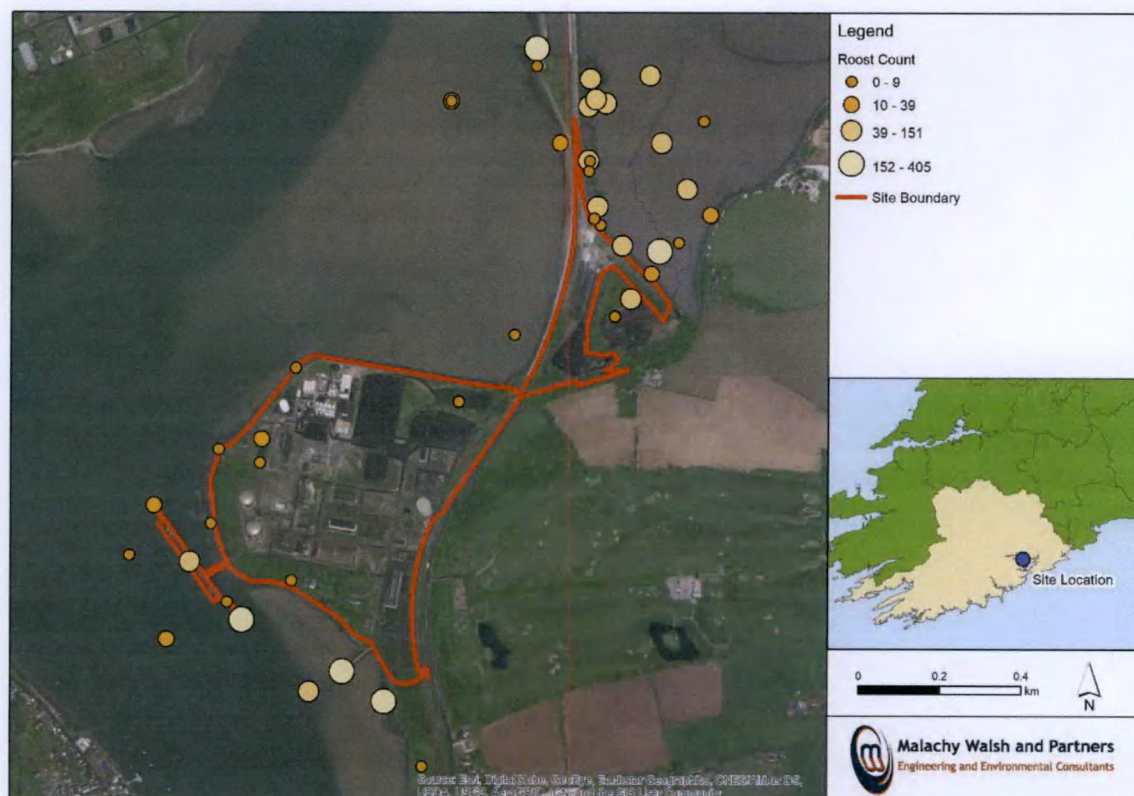
% - max peak count of each species as a percentage, in relation to the mean values obtained for Cork harbour over a 5-year period of 2012 to 2016.

**Table 7 Peak Counts (Hide Tide) of Species of Conservation Interest for each of the Study Areas in relation to the I-WeBS Five-Year-Means for Cork Harbour as a Whole.**

Species	I-Webs 5 yr. Mean Cork Harbour		H8		H13		H Main		H14		H15		H16	
	Peak	%	Peak	%	Peak	%	Peak	%	Peak	%	Peak	%	Peak	%
Bar-tailed Godwit	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Black-headed Gull	112	3%	12	0%	114	3%	41	1%	77	2%	0	0%	0	0%
Black-tailed Godwit	22	1%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Cormorant	0	0%	0	0%	41	12%	0	0%	7	2%	0	0%	0	0%
Common Gull	0	0%	0	0%	21	7%	0	0%	0	0%	0	0%	0	0%
Curllew	1	0%	0	0%	21	1%	0	0%	23	2%	0	0%	0	0%
Dunlin	0	0%	0	0%	1	0%	0	0%	0	0%	0	0%	0	0%
Great-crested Grebe	0	0%	0	0%	0	0%	0	0%	2	2%	0	0%	0	0%
Grey Plover	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Grey Heron	5	6%	0	0%	8	10%	8	10%	9	11%	0	0%	0	0%
Lapwing	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Lesser Black-backed Gull	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Little Grebe	1	1%	0	0%	1	1%	0	0%	0	0%	0	0%	0	0%
Oystercatcher	2	0%	13	1%	22	1%	0	0%	75	5%	0	0%	0	0%
Redshank	62	4%	0	0%	5	0%	21	1%	0	0%	0	0%	0	0%
Red-breasted Merganser	0	0%	0	0%	0	0%	3	5%	0	0%	0	0%	0	0%
Shelduck	72	6%	0	0%	24	2%	78	7%	0	0%	0	0%	0	0%
Shoveler	0	0%	0	0%	0	0%	2	9%	0	0%	0	0%	0	0%
Teal	96	8%	35	3%	4	0%	83	7%	2	0%	0	0%	0	0%
Wigeon	60	4%	0	0%	2	0%	30	2%	31	2%	0	0%	0	0%

% - max peak count of each species as a percentage, in relation to the mean values obtained for Cork harbour over a 5-year period of 2012 to 2016.





**Figure 5 High tide roost locations including total bird counts over the 6 monthly survey period for winter 2018-19**

Figures presented in **Tables 6 & 7** indicate that both the low tide survey areas L1 and L2 which are located north of the Belvelly Port Facility site (See **Figure 3**) support an array of species, some of which represent a high percentage of the total Cork Harbour population. Of the species listed of conservation interest for the Cork Harbour SPA the only species not recorded within L1 during the low tide surveys was Great Crested Grebe, likewise for L2 the only species not recorded was Shoveler.

No survey area including the Belvelly Port Facility site itself supports a substantial proportion of the Cork Harbours total populations of a particular species during the high tide counts. Black-headed Gull and Cormorant were noted to be the most abundant species recorded roosting/loafing during the high tide survey period but the peak counts only represent a small percentage of the overall Cork Harbour population with approximately one tenth of the Cork Harbour Cormorant population recorded. It is noted that the majority of these birds were recorded roosting along the southern pier and adjacent mooring dolphin. These areas will be unaffected by the proposed development and the erection of hoarding will provide a visual screen from the proposed works. Gulls were the most abundant birds noted roosting on the existing jetty. Gulls in general are relatively tolerant to human disturbance which is evident by presence of gulls in many coastal cities and towns.

With the exception of Dunlin and Grey Heron (see **Table 6**), none of the wintering birds, were recorded in numbers which would be considered nationally significant (i.e. 1% or more of the all-Ireland population of an Annex I species or 1% or more of the bio-geographical population of a migratory species).

## 6. CONCLUSION

Based on results of the winter bird surveys along with I-WeBS, NPWS and RPS data it can be concluded that the areas north of the proposed development site and within the Cork Harbour SPA have the potential to support a range of important bird species due to the presence of high value mudflat habitat. In addition, the open water areas adjacent to Marino Point have the potential to support piscivorous species associated with the Cork Harbour SPA as they forage.

A new study by BirdWatch Ireland has found that the number of waterbirds wintering in Ireland has declined by 15% over the past five years and 40% since the mid-1990's. Wading bird species, including Knot, Dunlin, Golden Plover and Redshank, have been the worst hit, suffering a combined loss of over 100,000 individuals (19%) over the past five years (Burke, et al. 2019). Oystercatcher, Dunlin, Redshank and Grey Plover, four species recorded during the winter bird survey, for example have seen a drop in numbers by more than 20%. Black-tailed Godwit, Grey Heron and Greenshank, three species recorded during the winter bird survey have alternatively shown an increase over the last five year period (Burke, et al. 2019).

The habitats in close proximity to the Belvelly Port Facility site have the potential to support some of the species listed as conservation interest of the Cork Harbour SPA. Different habitats will vary in their sensitivity periods based around function e.g. mudflats are most important during the winter for wintering waterbirds.

Although some waterbird species will be faithful to specific habitats within the SPA, many will at times also use habitats situated in proximate areas or in areas ecologically connected e.g. via coastal waters, to the SPA. These areas may be used as alternative high tide roosts, as a foraging resource or, be simply flown over, either on migration or as commuting corridors between feeding and roosting areas. It must also be taken into account that numerous factors are at play when it comes to numbers and distribution of species within the survey sites e.g. prey abundance, habitat quality and disturbance factors. As wading bird distribution is highly correlated with the densities of their prey (Yates et.al. 1993) it is likely that their distribution is linked to the densities of prey items.

Data collected during the I-WeBS counts between 2012 to 2016 recorded three species at nationally important numbers in the subsite directly north of the Belvelly Port Facility, namely Great Crested Grebe, Grey Plover and Dunlin. Of these three species it was noted the Great Crested Grebe was the only species of conservation interest not recorded during the low tide surveys conducted by Wildeye within the study site L1 during the 2018/2019 survey period.

It is noted that Grey Plover are a relatively disturbance tolerant species who are tolerant of moderate to high level visual disturbance and are presumed moderately sensitive to noise stimuli. Dunlin are a relatively tolerant species that habituates to various works. (Cutts, 2013).

Data collected during the NPWS surveys noted that the subsites north of the Belvelly Port Facility site were also of particular importance to species showing roosting/other behaviour. However, based on the dot density maps (see **Figure 2** above) produced for these surveys it can be seen that the concentrations of birds are primarily located west of the Martello Tower or along the land spit north of the tower. This data showed some correlation with that found by RPS who noted that the area around the Martello Tower, particularly the land spit to the north, was noted to be one of the most important high tide roosts in Cork Harbour. These areas are outside the proposed development site and will be screened from the proposed development by the erection of hoarding and as such birds roosting within these areas will be unaffected by the proposed development.

The Cormorants recorded during the 2018/2019 winter bird survey were noted roosting/loafing during the daytime along the southern pier and the stand alone mooring dolphin in close proximity, with lower numbers on the Jetty. Cormorants roost in shoreline and terrestrial habitats and generally use separate locations for daytime and nocturnal roosts. During the day, they roost on piers, jetties, gravel banks, etc.

There are a large number of known day roosts of Cormorants (approximately 37) within Cork Harbour (Atkins, 2019). See **Figure 6** below. The largest day roost is on the ADM jetty (circa 3.5km south) at the mouth of Monkstown Creek, which is located adjacent to the active deep water berth and ferry port at Ringaskiddy, while other sizeable day roosts occur on the sea wall enclosing the Dunkettle tidal impoundment (circa 4.5km northwest), on a gravel bank on the northern shore at Rathcoursey (circa 8km east) and on a platform 500m offshore from the northern side of ESB Aghada Generating Station (circa 7km outeast). Numerous other smaller daytime roosts occur in proximity (<3km) of the Belvelly Port Facility.

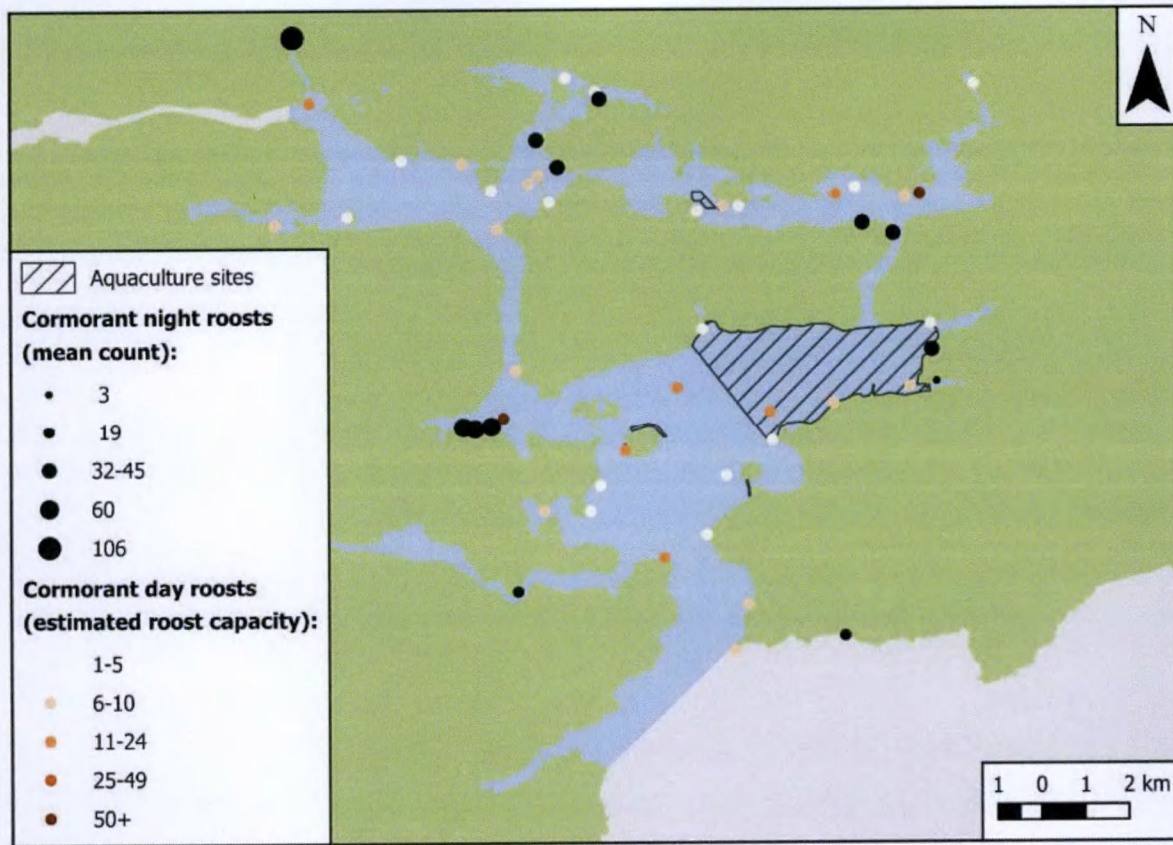


Figure 6 Cormorant Roost Sites in Cork (Atkins, 2019)

It is noted that recorded roosting/loafing sites within the Belvelly Port Facility site, with particular reference to the jetty, are located within a pre-existing and functional port facility. Therefore, given that an operational jetty currently exists at the site, it is safe to assume that these birds are already subject to and tolerant to a certain level of disturbance from jetty works and boat traffic. In Wexford Harbour, Cormorants roosting on the training walls along the navigation channel generally showed no disturbance response to marine traffic (Atkins, 2019).

In general, Cormorants disturbed from one day roost, by boats for example, are likely to be able to resettle on another day roost nearby without significant energy expenditure and the disturbance impact is unlikely to be significant. Cormorants are a mobile species and are frequently observed flying around the harbour (Atkins, 2019).

It is noted that both the southern pier and mooring dolphin will be unaffected by the proposed development. However, to mitigate against any potential disturbance of birds utilising these two structures, temporary hoarding will be erected to screen the development site from birds roosting/loafing on these structures.

As can be seen from **Tables 3 & 6**, four species were recorded as occurring as nationally important numbers directly north of the Belvelly Port Facility site. Grey Heron was noted occurring in nationally

important number within study area L7. Based on distance and visual screening of the site, proposed works within the Belvelly Port Facility site are unlikely to have an impact on Grey Heron utilising the habitats within study area L7. As stated above Great Crested Grebe was the only species of conservation interest not recorded during the low tide surveys conducted by Wildeye within the study site L1.

As part of the site investigations a predictive model for noise levels was run using a worst case scenario for the construction phase of the works. In the SPA areas to the north of the site,  $L_{Aeq\ 1\ h}$  levels associated with the worst case scenario will marginally exceed 65 dB alongside the site boundary and at the onsite lagoon. Levels will be lower further north.

Based on the observed responses of both Grey Plover and Dunlin to various noise stimuli, it has been concluded that the noise levels associated with the proposed development will be within acceptable levels i.e. below 70dB, which are unlikely to cause a response in birds using a fronting intertidal area (Cutts, 2013).

Some of the proposed works at these sites may take place within the winter period when impacts on wading birds listed as qualifying interests for the Cork Harbour SPA could theoretically occur. However, timing of works has the potential to reduce impact levels substantially, including the reduction in disturbance effects. It is noted though that the efficacy of timing in achieving this will depend on the species (and associated habitats) in proximity to the planned works.

Numerous species recorded have the ability to utilize alternative habitats within the wider landscape e.g. agricultural grassland. Curlew and Black-tailed Godwit for example, two species listed as species of conservation concern for the Cork Harbour SPA and recorded in proximity to the Belvelly Port Facility site, have the ability to forage terrestrially. When tidal flats are covered at high water, intertidally-foraging waterbirds are excluded and many will move to nearby fields to feed. Black-tailed Godwit and Curlew can be considered generalists, making use of a range of habitats, for example foraging across both intertidal mudflats and grassland habitats. For Black-tailed Godwit in southern Ireland, the feeding resources provided by grasslands have been shown to be important for the maintenance of the wintering population (Alves et al., 2013). Therefore, any disturbance events caused by the proposed project in proximity to adjoining mudflat habitats, will have a minimal impact on the foraging capabilities of these species due to their ability to utilise a wide array of habitats within the wider landscape that occur outside the zone of influence of the works.

Most disturbances to waterbirds result in an interruption to normal activity and the displacement of birds over variable distances, often into sub-optimal habitats. This can be critical during severe winters and can lead to a reduction in the carrying capacities of important wintering wetland sites. However, in general, studies show that most bird species have the ability to habituate to regular and continual sources of noise and visual disturbances providing there is no large 'startling' component. It is noted that the areas in which it is proposed to develop, are already subject to levels of disturbance by operational works within the Marinochem facility and traffic, including rail and boat. While there may be some temporary displacement of species during construction it is considered highly unlikely to have a negative

effect on their overall survival rate due to the close proximity of identical habitat and roosting and foraging resources i.e. high value mudflats with high densities of macro-invertebrates.

Cork Harbour is of high value for birds and mudflat habitat supports high numbers of wintering birds. Based on the desktop review of data and the results of the bird counts it is concluded that the habitats in proximity to the proposed development site, primarily those located to the north, are of moderate to high value for birds and works during the winter period should be avoided during the winter period. It is noted that the intertidal mudflats within the SPA that are in relatively close proximity i.e. within 200m, to the shoreline at the Belvelly Port Facility site are potentially the most susceptible to disturbance. However, results show that areas further north, located 200m from the shoreline of Marino at its closest point are of much greater importance (RPS, 2013). Birds within this 200m band will be exposed to noise emissions from the construction work at a predicted level of 65dB at the site boundary. It is considered that this is within acceptable noise levels for water birds.

Many species are seen to mitigate the effects of continued but harmless disturbance by habituation; as they become used to disturbance they react less strongly. Wintering birds in Cork harbour have habituated to moderate levels of disturbance associated with the daily activity of a busy harbour. With full implementation of the mitigation measures outlined e.g. erection of hoarding and timing of works where possible outside the wintering period, there will be no significant impacts of the proposed development on wintering birds within the Cork Harbour SPA. It is concluded that there will be no significant impacts of the proposed development on the Conservation Objectives of the Special Protection Areas in Cork Harbour or neighbouring coastlines.

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### Appendix 1- Count dates, times and tidal conditions.

Survey Number	Sector	HW / LW	Year	Month	Day	HW Time	LW Time	Spring / Neap	Start	End	Duration	Disturbance
1	L1	LW	2018	11	25	06:26	12:55	S	11:40	12:55	75	0
1	L2	LW	2018	11	25	06:26	12:55	S	10:00	10:50	50	2
1	L3	LW	2018	11	25	06:26	12:55	S	10:50	11:10	20	0
1	L4	LW	2018	11	25	06:26	12:55	S	12:50	13:20	30	1
1	L5	LW	2018	11	29	09:48	16:19	N	14:00	14:30	30	2
1	L6	LW	2018	11	29	09:48	16:19	N	14:30	15:00	30	2
1	L7	LW	2018	11	29	09:48	16:19	N	15:00	16:40	100	2
2	L1	LW	2018	11	30	10:53	17:30	N	14:30	15:05	35	1
2	L4	LW	2018	11	30	10:53	17:30	N	15:10	15:25	15	1
2	L2	LW	2018	11	30	10:53	17:30	N	15:40	16:10	30	1
2	L3	LW	2018	11	30	10:53	17:30	N	16:10	16:30	30	1
2	L5	LW	2018	12	2	13:23	07:15	N	08:30	08:42	12	2
2	L6	LW	2018	12	2	13:23	07:15	N	08:42	09:00	18	2
2	L7	LW	2018	12	2	13:23	07:15	N	09:00	10:00	60	1
3	L5	LW	2018	12	21	16:17	10:27	S	08:18	08:38	20	2
3	L4	LW	2018	12	21	16:17	10:27	S	08:38	09:06	28	2
3	L1	LW	2018	12	21	16:17	10:27	S	09:10	10:00	50	1
3	L2	LW	2018	12	21	16:17	10:27	S	10:20	11:25	65	2
3	L3	LW	2018	12	21	16:17	10:27	S	11:25	11:40	15	1
3	L6	LW	2018	12	21	16:17	10:27	S	12:05	12:25	20	1
3	L7	LW	2018	12	21	16:17	10:27	S	12:25	13:20	55	2
4	L7	LW	2019	1	2	14:52	08:49	N	10:50	11:50	60	2
4	L6	LW	2019	1	2	14:52	08:49	N	11:50	12:10	20	1
4	L5	LW	2019	1	3	15:44	09:56	N	08:30	08:45	15	1
4	L4	LW	2019	1	3	15:44	09:56	N	08:50	09:10	20	1
4	L1	LW	2019	1	3	15:44	09:56	N	09:15	09:50	35	1
4	L2	LW	2019	1	3	15:44	09:56	N	10:00	10:40	40	2
4	L3	LW	2019	1	3	15:44	09:56	N	10:40	10:50	10	1



Survey Number	Sector	HW / LW	Year	Month	Day	HW Time	LW Time	Spring / Neap	Start	End	Duration	Disturbance
5	L1	LW	2019	2	12	09:56	16:20	S	15:02	15:55	53	1
5	L2	LW	2019	2	12	09:56	16:20	S	13:20	14:35	75	1
5	L3	LW	2019	2	12	09:56	16:20	S	14:35	14:50	15	1
5	L4	LW	2019	2	12	09:56	16:20	S	16:00	16:10	10	2
5	L5	LW	2019	2	12	09:56	16:20	S	16:10	16:18	8	1
5	L6	LW	2019	2	12	09:56	16:20	S	16:28	16:38	10	1
5	L7	LW	2019	2	12	09:56	16:20	S	16:40	17:25	45	1
6	L5	LW	2019	3	18	15:21	09:23	N	08:00	08:20	20	1
6	L4	LW	2019	3	18	15:21	09:23	N	08:20	08:40	20	1
6	L1	LW	2019	3	18	15:21	09:23	N	08:45	09:30	45	1
6	L2	LW	2019	3	18	15:21	09:23	N	09:45	10:35	50	1
6	L3	LW	2019	3	18	15:21	09:23	N	10:35	10:50	15	1
6	L7	LW	2019	3	18	15:21	09:23	N	11:08	11:45	37	1
6	L6	LW	2019	3	18	15:21	09:23	N	11:50	12:05	15	1

### Appendix 2 – Count Locations



Appendix 3 - Mean & Peak Counts for waterbirds recorded during the winter bird survey period.

Species	Thresholds		I-Webs 5 yr. Mean Peak Counts Cork Harbour	L1		L2		L3		L4		L5		L6		L7		HB		H13		H main		H14		H15		H16		
	1% National	1% International		Mean	Peak	Mean	Peak	Mean	Peak	Mean	Peak	Mean	Peak	Mean	Peak	Mean	Peak	Mean	Peak	Mean	Peak	Mean	Peak	Mean	Peak	Mean	Peak	Mean	Peak	
Bar-tailed Godwit	BA	150	1200	0	1	1	6	0	0	0	0	0	0	0	5	29	0	0	0	0	0	0	0	0	0	0	0	0	0	
Brent Goose	BG	360	400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	
Black-headed Gull	BH	20000	20000	136	252	429	713	92	169	125	210	15	59	20	56	95	176	24	112	3	12	40	114	12	41	19	77	0	0	
Black-tailed Godwit	BW	190	610	27	126	32	121	0	0	15	25	0	0	2	10	41	88	4	22	0	0	0	0	0	0	0	0	0	0	
Cormorant	CA	120	1200	6	17	26	60	4	7	14	39	1	2	1	3	36	51	0	0	0	0	23	41	0	0	2	7	0	0	
Common Gull	CM	16400	16400	4	13	27	57	9	17	23	97	3	12	5	25	17	36	0	0	0	0	10	21	0	0	0	0	0	0	
Common Sandpiper	CS			1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Curlew	CU	350	8400	20	30	43	72	0	0	7	9	0	0	0	0	0	11	32	0	1	0	0	4	21	0	5	23	0	0	
Dunlin	DN	570	13300	239	1129	167	985	0	0	0	0	0	0	0	0	0	5	31	0	0	0	0	0	0	0	0	0	0	0	
Little Egret	ET	20	1300	4	5	1	3	0	0	0	1	0	0	0	0	0	1	1	2	0	0	0	1	0	0	0	0	0	0	
Gadwall	GA	20	600	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Great Black-backed Gull	GB	4200	4200	2	3	31	94	3	7	4	9	2	8	6	22	6	15	0	0	0	0	7	27	0	0	0	2	0	0	
Green Sandpiper	GC	15500	15500	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0	0	2	0	0	
Goldeneye	GE	60	11500	12	1	2	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Great-crested Grebe	GG	40	3500	0	0	6	18	3	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Greenshank	GK	20	2300	7	12	2	4	0	0	1	0	0	0	0	0	2	0	0	0	0	0	0	1	4	0	0	0	0	0	
Common Guillemot	GU			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Grey Plover	GV	30	2500	1	4	7	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Grey Heron	H.	25	2700	3	4	7	17	1	2	2	3	0	0	0	0	0	14	33	2	5	0	0	5	8	2	8	2	9	0	0
Herring Gull	HG	10200	10200	4	8	29	59	3	10	6	15	3	10	33	127	7	28	0	0	0	0	6	15	0	1	5	0	0	0	
Ring-billed Gull	IN	20000	20000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0	0	0	0	0	
Kingfisher	KF			2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	
Lapwing	L.	1100	20000	42	58	6	26	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	
Lesser Black-backed Gull	LB	5500	5500	4	10	34	75	0	0	1	4	0	0	0	0	0	3	7	0	0	0	0	0	0	0	0	0	0	0	
Little Grebe	LG	20	4000	4	8	2	3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	
Long-tailed Duck	LN	17250	17250	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Moorhen	MH	20000	20000	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Mute Swan	MS	90	90	45	0	1	2	0	0	0	0	0	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Oystercatcher	OC	690	8200	43	68	77	109	0	0	4	16	0	0	0	0	22	60	0	2	2	13	8	22	0	0	22	75	0	0	
Mediterranean Gull	MU	770	770	0	0	0	1	0	1	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Razorbill	RA			0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	3	0	0	0	0	0	
Redshank	RK	300	3900	64	100	53	84	0	0	4	8	0	0	0	0	65	161	16	62	0	0	1	5	6	21	0	0	0	0	
Red-breasted Merganser	RM	20	1700	2	6	7	15	0	0	0	0	0	0	0	0	1	3	0	0	0	0	0	0	1	3	0	0	0	0	
Red-throated Diver	RT	20	3000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Ringed Plover	RP	100	730	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5	0	0	
Shag	SA	2000	2000	0	0	0	1	0	1	0	0	1	0	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	
Snipe	SN	20000	20000	0	0	1	3	0	0	0	0	0	0	0	0	0	1	4	1	2	0	1	10	38	1	3	0	0	0	
Shelduck	SU	120	3000	18	36	34	99	0	0	3	8	0	0	1	4	20	36	12	72	0	0	4	24	35	78	0	0	0	0	
Showeler	SV	30	400	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	
Teal	T.	340	5000	48	117	46	79	0	0	24	38	0	0	0	0	103	242	16	96	12	35	1	4	33	83	0	2	0	0	
Turnstone	TT	95	1400	0	0	12	21	0	0	0	0	0	0	0	0	2	13	0	0	0	0	0	0	0	0	0	0	0	0	
Black Guillemot	TY			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Water Rail	WA			0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Whimbrel	WM	6700	6700	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Wigeon	WN	630	15000	7	34	29	61	7	38	3	8	0	0	0	0	0	0	10	60	0	0	0	2	10	30	5	31	0	0	

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## **Appendix 7.1**

### **Flood Risk Assessment**

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# **Malachy Walsh and Partners**

## **Consulting Engineers**

Cork | Tralee | Limerick | London

Proposed Agricultural Fertiliser Facility and  
Additional Port Operational Uses

Flood Risk Assessment

on behalf of  
Goulding Chemicals Limited  
and

Belvelly Marino Development Company DAC (BMDC)

Project	Document	Revision	Issue	Prepared	Checked	Date
21082	6003	C	For Planning	Sean Doyle	Micheál Fenton	December 2020

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## List of Abbreviations

RFRA	Regional Flood Risk Assessment
SFRA	Strategic Flood Risk Assessment
FRA	Flood Risk Assessment
CFRAM	Catchment Flood Risk and Management
AEP	Annual Exceedance Probability
MRFS	Mid-Range Future Scenario

## 1 Introduction

### 1.1 Objectives

Goulding Chemicals Limited and Belvelly Marino Development Company DAC (BMDC) are seeking joint planning permission for the construction and operation of an agricultural fertiliser facility and additional port operational use of the jetty to facilitate cargo vessels at the Belvelly Port Facility, Marino Point, County Cork. The new agricultural fertiliser facility will replace the existing one in Cork City. The purpose of this report is to establish the flood risk associated with the proposed development and, if appropriate, to recommend mitigation measures to prevent any increase in flood risk within or outside the site.

The report has been prepared in the context of *The Planning System and Flood Risk Management – Guidelines for Planning Authorities, November 2009*, published by the Office of Public Works and the Department of Environment, Heritage and Local Government. Flood Risk Assessments are carried out at different scales by different organisations. The hierarchy of assessment types are Regional (RFRA), Strategic (SFRA) and Site-specific (FRA). This report is site-specific.

### 1.2 Development proposal

The proposed development at the Belvelly Port Facility will consist of the following main elements:

- The construction and operation of an agricultural fertiliser blending and bagging facility which facilitates the relocation of Goulding Chemicals Limited from Cork City to the Belvelly Port Facility. The proposed facility will consist of:
  - a storage warehouse;
  - a bagging and palletising facility;
  - an office building to support customer service and weighbridge operations;
  - external storage bays with associated circulation space, weigh-bridges, access control and security facilities; and
  - importation of raw materials at the existing jetty.

The primary use of the proposed fertiliser facility will be for bagging and blending of dry bulk materials for storage and distribution. All finished fertiliser product will be distributed from the facility by road.

- Additional BMDC port operational use of the existing jetty to facilitate general dry cargo vessels at the Belvelly Port Facility. No construction work is required for this additional operational use.

The jetty at the Belvelly Port Facility site is currently used to export dry cargo (wooden logs), as a lay-by berth for Port work vessels and to moor occasional vessels for safe harbour or minor maintenance work. In addition to the shipping associated with Goulding's operations, it is expected that approximately 40 additional ships will berth at the jetty each year, carrying general cargo material. The cargo types proposed will include woodchip, machinery parts, deep sea maintenance and exploratory vessel engineering cargo, and other miscellaneous dry cargo. The size and frequency of cargo vessels will be variable and be subject to the various customers' needs. On average, ships will be berthed for 1 to 2 days to offload / load cargo but may be longer depending on cargo size and weather conditions.

Marino Point is a brownfield site once occupied by Irish Fertiliser Industries (IFI) to manufacture fertiliser. As part of a previously submitted planning application to Cork County Council (Ref 19/6783), it is currently proposed to demolish above and below ground structures and foundations and associated services and to infill a portion of the man-made lagoon to the north of the site using the demolition material. The remaining area of the lagoon will be retained as wetland habitat. It is also proposed to construct a new rail connection and restore the existing rail siding at the northern end of the site. New utilities including electricity, water, waste water and storm water management will be provided. The proposed works will clear the site of redundant and derelict buildings and structures, and provide infrastructure and utility services to comply with current standards and environmental protection requirements.

The site location is shown in Figure 1 and an aerial view is shown in Figure 2.

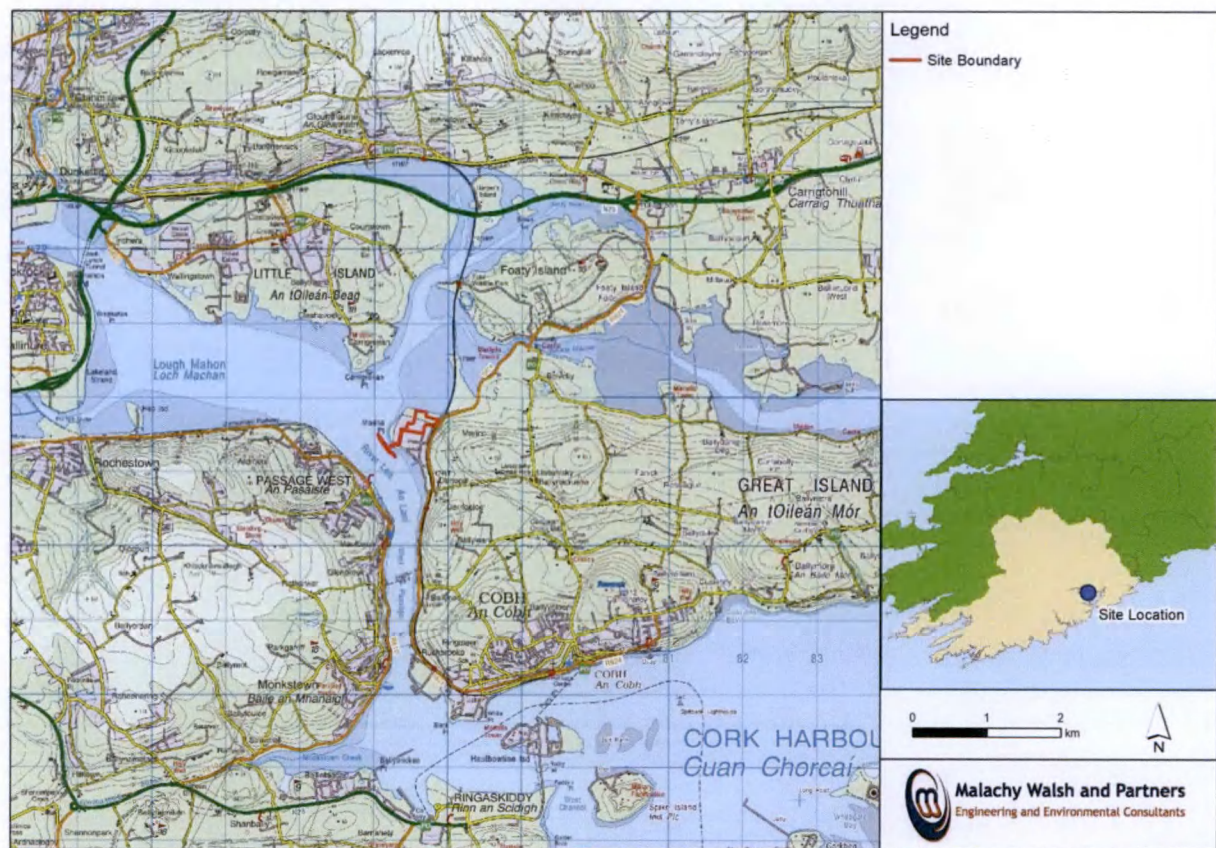


Figure 1 – Site location map<sup>1</sup>

<sup>1</sup> Map reproduced from Ordnance Survey Ireland by permission of the Government, licence number EN 00115720.





Figure 2 – Site location aerial view

### 1.3 Methodology

The Flood Risk Management Guidelines document outlines three stages in the assessment of flood risk as follows:

- *Stage 1 Flood risk identification* – to identify whether there may be any flooding or surface water management issues related to a plan area or proposed development site that may warrant further investigation;
- *Stage 2 Initial flood risk assessment* – to confirm sources of flooding that may affect a plan area or proposed development site, to appraise the adequacy of existing information and to determine what surveys and modelling approach is appropriate to match the spatial resolution required and complexity of the flood risk issues. The extent of the risk of flooding should be assessed which may involve preparing indicative flood zone maps. Where existing river or coastal models exist, these should be used broadly to assess the extent of the risk of flooding and potential impact of a development on flooding elsewhere and of the scope of possible mitigation measures; and
- *Stage 3 Detailed risk assessment* – to assess flood risk issues in sufficient detail and to provide a quantitative appraisal of potential flood risk to a proposed or existing development, of its potential impact on flood risk elsewhere and of the effectiveness of any proposed mitigation measures. This will typically involve use of an existing or construction of a hydraulic model or a river or coastal cell across a wide enough area to appreciate the catchment wide impacts and hydrological processes involved.

This report follows the general sequence of assessment described above.

## 2 Flood Risk Identification (Stages 1 and 2)

Possible sources of flood risk were identified by

- Walkover survey of the site;
- Topographical survey of the site;
- Examination of available information on the OPW website ([www.floodmaps.ie](http://www.floodmaps.ie));
- Reference to the Tidal Flood Extents maps which form part of the Lee CFRAM Study.

The Summary Local Area Report for the area on the OPW web site, <http://www.floodmaps.ie>, identifies some flood event in Passage West but none at or near the site. The Summary Local Area Report map, which lists five of nine results, is shown in Figure 3 below.

Because of its location and the absence of any rivers in or near the site, the only source of potential flooding is the high tide levels in Cork Harbour. The extreme high tides are due to a combination of astronomical effects, low atmospheric pressure, storm surge and wave action.

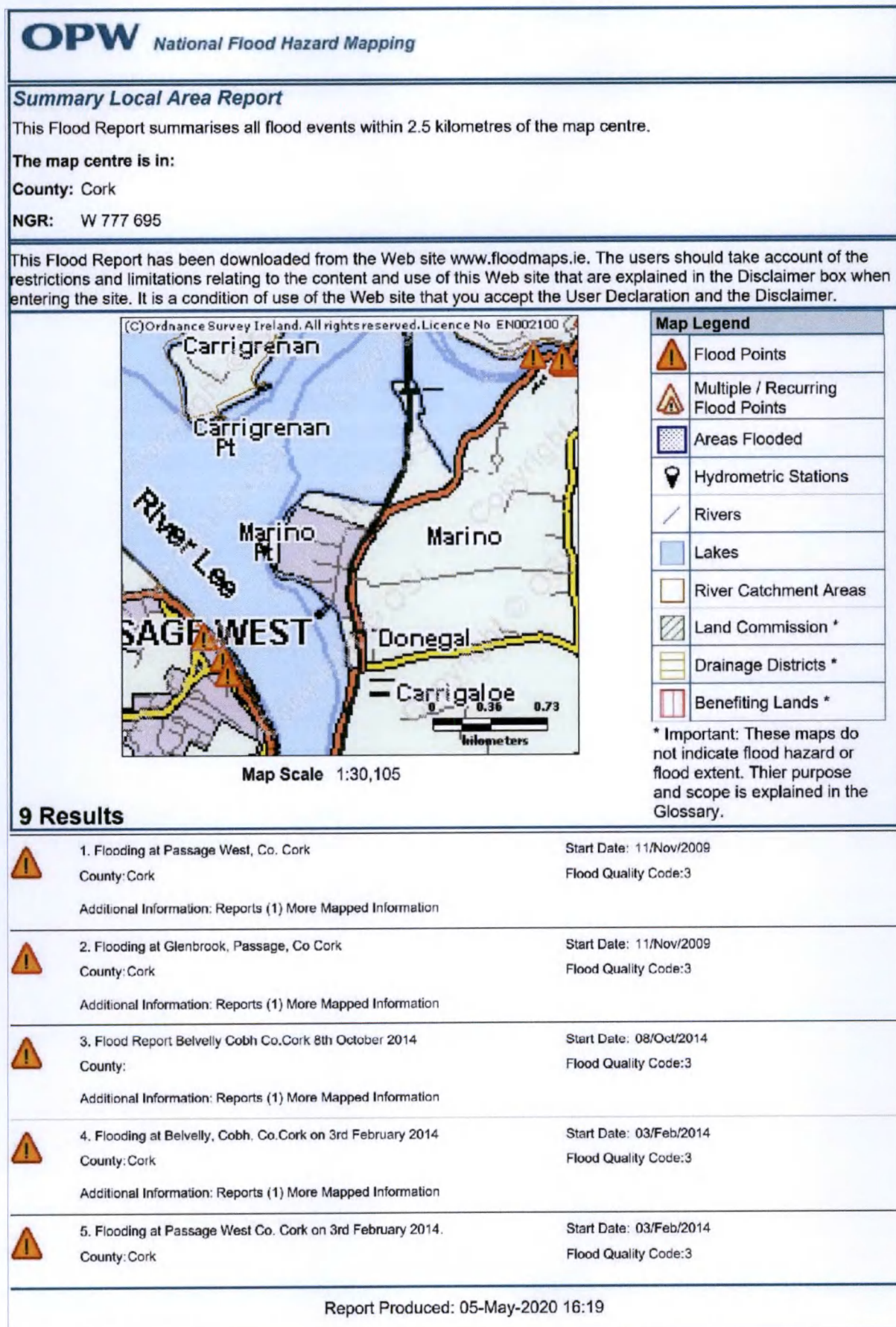


Figure 3 – OPW Summary Local Area Report

### 3 Detailed Flood Risk Assessment (Stage 3)

The most recent documents relating to flood levels in Cork Harbour are the *Flood Risk Management Plan - Lee, Cork Harbour & Youghal Bay, OPW, 2018* (FRMP) and the associated Lee CFRAM Study maps. A summary of the available hydrometric data on which the FRMP was based is shown in Table 2.2 of the document and includes the Irish Coastal Protection Strategy Study Total tide +surge design levels calculated in 2012. Table 1 below shows a summary of the predicted water levels for the 10%, 0.5% and 0.1% AEP events in Cork Harbour. The predicted levels at Marino Point are interpolated from those at Little Island and Passage West.

Table 5.2 of the FRMP 2018 document indicates a Mean Sea Level Rise of 500 mm above the current climate value for the Mid Range Future Scenario (MRFS). The date for the MRFS is not specified but is normally taken as year 2100. The resulting MRFS water levels for each Annual Exceedance Probability (AEP) are also shown in Table 1 below. The AEP is the statistical probability that a flood of a given magnitude will be equalled or exceeded in any year. The AEP gives no indication of when a flood event is likely to occur.

Location	CFRAM Map Reference	WL 10%	WL 0.5%	WL 0.1%
Little Island	M9/UA/EXT/CURS/009	2.46	2.76	2.91
Passage West	M9/UA/EXT/CURS/021	2.43	2.73	2.89
Belvelly Port Facility, Marino Point (Current climate 2012)		2.45	<b>2.75</b>	2.90
Belvelly Port Facility, Marino Point (MRFS)		2.95	<b>3.25</b>	3.40

**Table 1 – Predicted water levels**

The design water level for the Belvelly Port Facility site is based on the 1 in 200 year (0.5% AEP) coastal flooding event which is 3.25 mOD. An appropriate freeboard above this level should be provided depending on the particular design element.

The CFRAM maps for Little Island and Passage West are reproduced in Figure 4 and Figure 5 respectively.



Figure 4 – Lee CFRAM Study, Tidal Flood Extents map for current climate scenario at Little Island

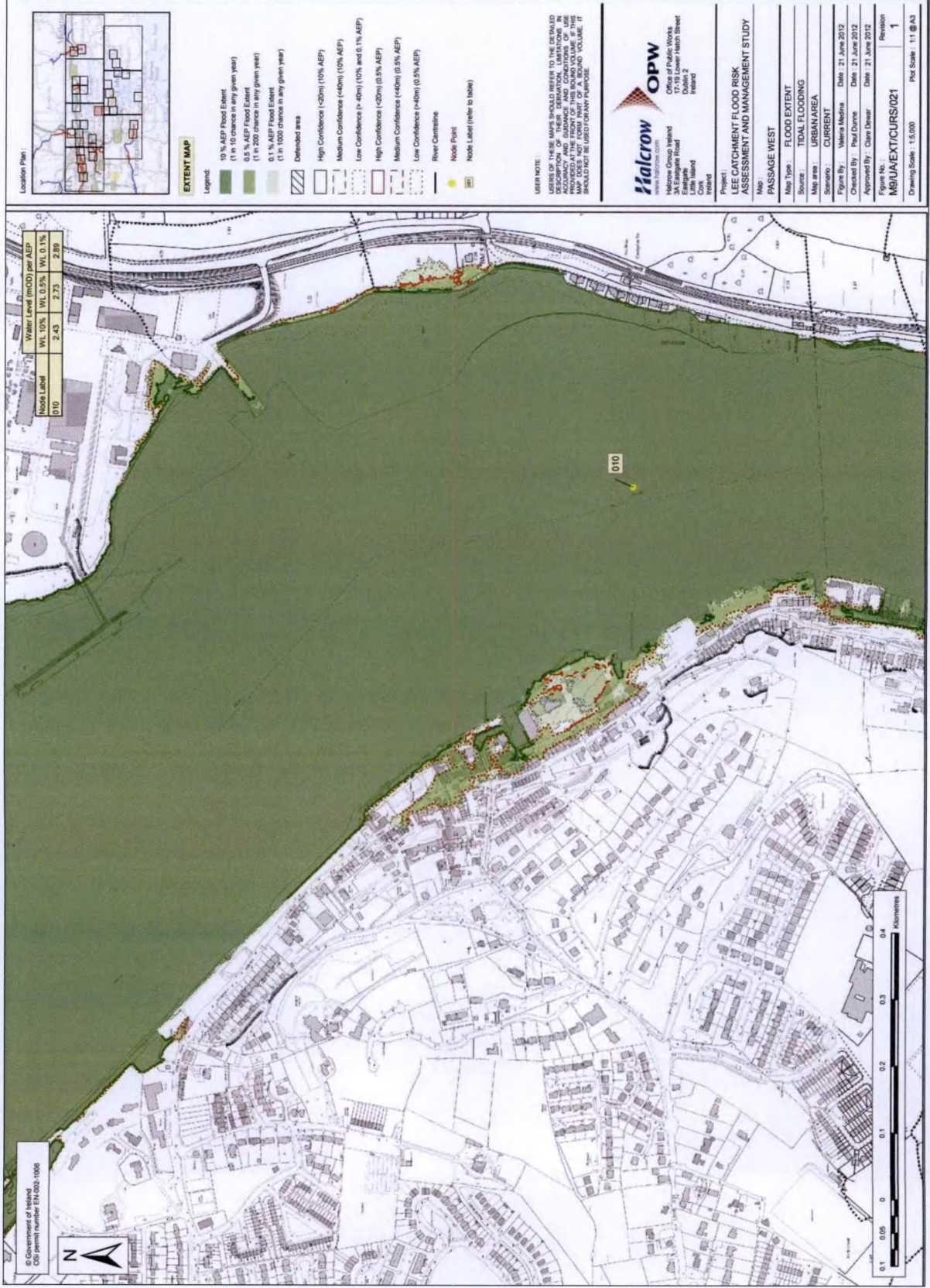


Figure 5 – Lee CFRAM Study, Tidal Flood Extents map for current climate scenario at Passage West

## 4 Flood zone mapping

The Flood Risk Management Guidelines document defines three flood zone types as follows:

*Flood Zone A* – where the probability of flooding from rivers and the sea is highest (greater than 1% or 1 in 100 for river flooding or 0.5% or 1 in 200 for coastal flooding);

*Flood Zone B* - where the probability of flooding from rivers and the sea is moderate (between 0.1% or 1 in 1,000 and 1% or 1 in 100 for river flooding and between 0.1% or 1 in 1000 year and 0.5% or 1 in 200 for coastal flooding); and

*Flood Zone C* - where the probability of flooding from rivers and the sea is low (less than 0.1% or 1 in 1,000 for both river and coastal flooding). Flood Zone C covers all areas of the plan which are not in zones A or B.

The flood zones are defined without taking the effects of future climate change into account. The zoning for areas protected by flood defences does not change because of the potential for breaching of the defences.

Based on the flood levels in Table 1 above, the boundary between Flood Zones A and B is at a contour level of 2.75 mOD and the boundary between Flood Zones B and C is at a contour level of 2.90 mOD. The majority of the proposed fertiliser facility site is in Flood Zone C. An area at the northern boundary measuring 7,000 m<sup>2</sup> is in Flood Zone A and the intervening area of 1,800 m<sup>2</sup> is in Flood Zone B. These areas are currently vulnerable to tidal flooding for tide levels with return periods of less than 200 years and less than 1,000 years, respectively. The flood zones are shown in Figure 6 below.



Figure 6 – Flood Zones

The planning application area for the proposed agricultural fertilizer facility and the additional BMDC port operational use includes the existing jetty to the southwest. The topographical survey information for the site confirms that the jetty and approach road are in Flood Zone C and are also higher than the design flood level of 3.25 mOD.

As part of planning application 19/6783 for Belvelly Port Facility site demolition and infrastructure works, it is proposed to increase the height of the existing revetment near the northern boundary of the site to a level of 4.25 mOD which is 1.00 metres above the predicted flood level for the mid-range future climate scenario. This will protect the northern part of the site so that the existing paved surface can be retained at its existing level. Notwithstanding the protection afforded by the revetment, this area (8,800 m<sup>2</sup>) will still be in Flood Zones A and B and the development of the site will have to take account of the associated residual risk.

## 5 Recommendations

According to Table 3.1 of the Flood Risk Management Guidelines, Flood Zones B and C are considered appropriate for commercial and industrial use. Flood Zone A would be suitable as an outdoor storage area. The surface level in Zones A and B can be increased if necessary, effectively changing these areas to Zone C, without increasing flood risk. In this instance there would be no requirement to provide compensatory storage because the displacement of flood water is into the harbour.

The finished floor levels of all buildings on the site should have an appropriate freeboard above the design flood level of 3.25 mOD. All materials stored on site should also be above this level.

The current development proposals are considered appropriate in accordance with the Flood Risk Management Guidelines and a Justification Test, as described in Section 3 of the Guidelines, is not required.

## 6 Potential impacts of flooding elsewhere

Any increase in the existing surface level or any new structure within the areas at risk of flooding can only displace flood water to the harbour; hence there is no potential for flooding outside the confines of the site due to the proposed development.

## 7 Storm drainage

The storm drainage system for the proposed fertiliser facility development will outfall to Cork Harbour via the existing storm water drainage network to the north of the site. Because the outfall will be in a tidal zone the flow will be restricted or prevented during the upper part of the tide cycle and all storm water collected during this time period will have to be retained on site. The temporary storage will be provided by pumping into an overground tank on the site when the storage capacity of the storm pipe system is exceeded. The details are shown on the storm drainage planning drawings included with the planning application.



## 8 Summary and conclusions

The only potential source of flooding on the site is coastal flooding due to abnormally high tides. The design flood level has been established as 3.25 mOD for the mid-range future climate scenario.

The site is predominantly in Flood Zone C as defined in the Flood Risk Management Guidelines. The northern part of the site, an area of 8,800 m<sup>2</sup>, is in Flood Zones A and B.

Flood Zones B and C are appropriate for commercial and industrial use. Flood Zone A is appropriate as an outdoor storage area. If necessary, the surface levels of any part of the site can be raised without increasing flood risk. The proposed development will not increase flood risk outside the confines of the site.

Temporary on-site storage of storm water is to be provided for extreme storm events that coincide with the upper part of the tide cycle.

## 9 References

*The Planning System and Flood Risk Management – Guidelines for Planning Authorities*, Office of Public Works and the Department of Environment, Heritage and Local Government, November 2009.

OPW *Planning and Development Flood Policy*, published on [www.flooding.ie](http://www.flooding.ie)

OPW *Flood Hazard Mapping*, [www.floodmaps.ie](http://www.floodmaps.ie)

*Lee CFRAM Study*, Office of Public Works and Halcrow.