MONKSTOWN MARINA

Appropriate Assessment

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Executive Summary

An application was lodged to Cork County Council (CCC) in relation to a proposed marina development at Monkstown, Co Cork on 15/10/08 and an EIS submitted in relation to the proposed development on 28/08/09 (Planning Ref 08/9317). A Request for Further Information (RFI) was issued by CCC dated 13/10/09 which required the preparation of an Appropriate Assessment (AA) in accordance with the legislative requirements of the EU Habitats Directive. This report aims to fulfil this requirement in addition to certain issues itemised within the RFI as follows:

a. Issues of particular concern which have not been fully addressed in the EIS and which must be addressed in the Appropriate Assessment report include impacts of noise on bird and cetacean species during construction, as well as impacts on bird species arising from potentially increased levels of recreational activity within the area.

b. The Appropriate Assessment Report should provide clear information in relation to all proposed mitigation including information as to how measures will be implemented and by whom; evidence of the degree of confidence in their likely success; a timescale relative the construction of the development for their development as well as evidence as to how the measures will be monitored and, should mitigation fail, how that failure will be rectified.

c. You are strongly encouraged to explore opportunities for enhancing biodiversity in the design of the project.

d. Information relating to potential impacts on water quality, tidal regimes, and sedimentation arising from the proposed reclamation works and the introduction of fill into marine ecosystems which is provided in the EIS should also be provided in the Appropriate Assessment Report.

e. Clarify whether the hydrodynamic modeling was for a once-off capital dredging (construction of the dredged basin) or if it took into account the cumulative effects of dredging maintenance (and accumulated net sediment loss) over the lifetime of the proposed development. (14.33 of EIS). If it was based on a once-off capital dredging, you are advised to submit information on the cumulative impact of dredging over the lifetime of the development.

f. Clarify the source(s) of data upon which the conclusion that wintering waterfowl feeding in the SPA is confined primarily to the period November to April. (14.35 of EIS).

g. Clarify the studies (with references) and/or observations from which the conclusion is derived that habituation will occur to the marina activities by birds. (14.35 of EIS).

i. All cetaceans are listed under Annex N (including those in Annex II) of Council Directive 92/43/EEC. Accordingly, under Article 12 of that Directive, it is an offence to deliberately capture, disturb or kill a cetacean or take actions that result in deterioration or destruction of their breeding sites or resting places within Ireland's Exclusive Economic Zone. Furthermore, dolphin species, porpoise species, seal species, and whale species are protected wild animals under the Wildlife Amendment Act and it is an offence to willfully interfere with or destroy the breeding place or resting place of any protected wild

animal. With respect to the proposed development the potential for sound sources introduced into the marine environment from construction and dredging activity should be assessed in detail and if appropriate, mitigation to reduce potential risks proposed.

j. In order for a full assessment of the potential implications to the marine environment to the undertaken, it is imperative that the class of sediments to be dredged is known. The results of the intended chemical assay of sediments from the target dredge area shall be submitted.

The AA examines the potential effects of the proposed Marina Development on the Cork Harbour SPA and Monkstown Creek pNHA and concludes that subject to the implementation of the specified mitigation measures, no significant impacts are anticipated on any of the qualifying interests or on the integrity of the site.

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EirEco Environmental Consultants

1 INTRODUCTION

This report has been prepared by Paul Murphy of EirEco Environmental Consultants in association with Cronin Millar Consulting Engineers, on behalf of Monkstown Bay Marina Co. Ltd. to determine the potential effects, if any, of a proposed marina development at Monkstown, Co. Cork on the adjacent Monkstown Creek Special Protection Area (part of the Cork Harbour SPA Site Code No. 004030) and proposed Natural Heritage Area (Site Code No. 001979). The purpose of this assessment is to determine the appropriateness, or otherwise, of the proposed scheme in the context of the conservation status of such sites.

1.1 Regulatory Context

The Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora better known as "The Habitats Directive" provides the framework for legal protection for habitats and species of European importance. Articles 3 to 9 provide the legislative means to protect habitats and species of Community interest through the establishment and conservation of an EU-wide network of sites known as Natura 2000. These are Special Areas of Conservation (SACs) designated under the Habitats Directive and Special Protection Areas (SPAs) designated under the Conservation of Wild Birds Directive (79/409/EEC) (better known as "The Birds Directive").

Article 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans and projects likely to affect Natura 2000 sites (Annex 1.1). Article 6(3) establishes the requirement for Appropriate Assessment:

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

1.2 Stages of Article 6 Assessment

This Appropriate Assessment (AA) has been undertaken in accordance with the European Commission Methodological Guidance on the provision of Article 6(3) and 6(4) of the 'Habitats' Directive 92/43/EEC (EC 2001) "*Assessment of plans and projects significantly affecting Natura 2000 site – Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC*" and the European Commission Guidance '*Managing Natura 2000 Sites*'. In complying with the obligations under Article 6(3) and following the above Guidelines, this AA has been structured as a stage by stage approach as follows:

Screening

- Description of the proposed project
- Identification of Natura 2000 sites potentially impacted
- Identification and description of individual and cumulative impacts likely to result from the project
- Assessment of the significance of identified impacts on site integrity
- Exclusion of Natura sites from the assessment process where it can be objectively concluded that there will be no significant impacts

Appropriate Assessment

- Description of the Natura 2000 sites that will be considered further in the AA
- Description of significant impacts on the conservation feature of these sites likely to occur from the scheme
- Details of measures to avoid or mitigate any significant impacts
- Assessment of Alternative Solutions (if applicable)
- Examination of alternative solutions (if applicable)
- Assessment where no alternative solutions remain and where adverse impacts remain
- The "IROPI test" (Imperative Reasons of Over-riding Public Interest) and compensatory measures

The Habitats Directive promotes a hierarchy of avoidance, mitigation and compensatory measures. Firstly, the proposed scheme should aim to avoid any negative impacts on European sites by identifying possible impacts early in the plan making, and writing the plan in order to avoid such impacts. Secondly, mitigation measures should be developed, if necessary, during the AA process to the point, where no adverse impacts on the site(s) remain. Where a proposed scheme is still likely to result in adverse effects, and no alternative solutions are identified, if the proposed scheme is required for imperative reasons of overriding public interest (IROPI test) under Article 6 (4) of the Habitats Directive, then compensation measures are required to offset any remaining adverse effect.

2. STAGE 1: SCREENING

2.1 Consultations

Consultations have been undertaken in relation to this scheme with the Department of the Environment, Heritage and Local Government and Cork County Council.

2.2 Natura Sites Identified

The location of the proposed Marina at Monkstown is not covered by any designated conservation area. The nearest designated area is Monkstown Bay, part of the Cork Harbour Special Protection Area (SPA) (Site code no.004030) and a proposed Natural Heritage Area (pNHA) (site code no.001979). The location of the proposed site was excluded from the SPA / pNHA under appeal in 2009 and the boundary of the designated area now runs along the southern boundary of the site (See Figure 1).

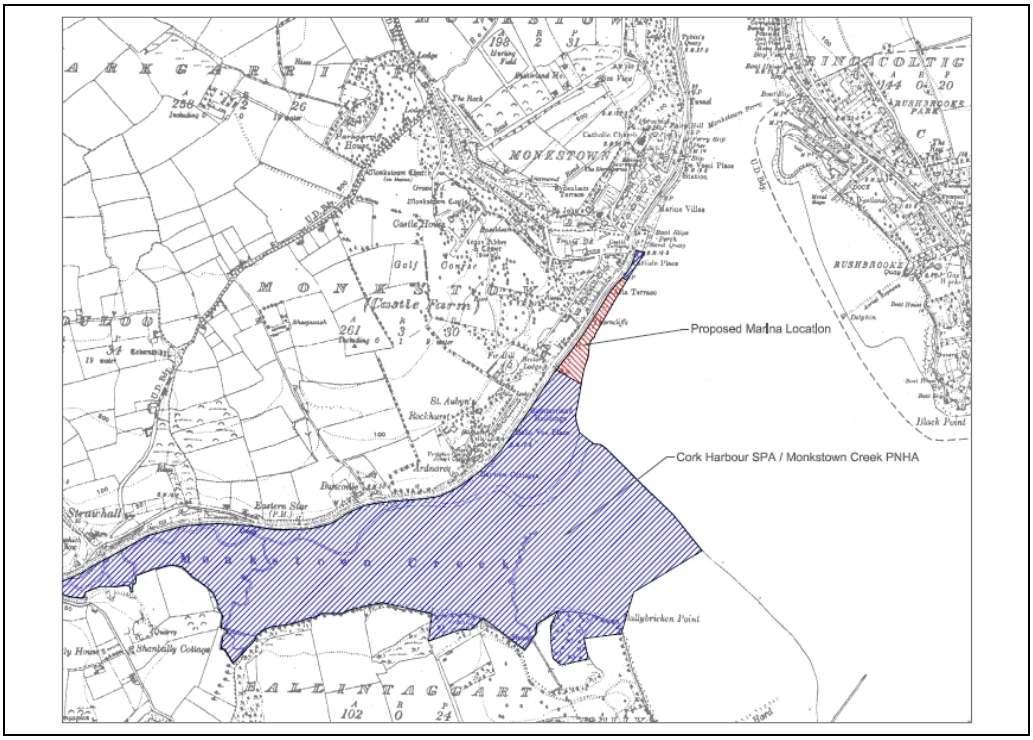

Figure 1. Proposed site location showing Cork Harbour SPA / Monkstown Creek pNHA

Monkstown Creek was originally designated as a pNHA on account of its importance for wintering waterfowl. The creek was incorporated into the Cork Harbour SPA of which it forms an isolated part. The SPA extends to include most of the main intertidal areas in Cork Harbour including all the North Channel, the Douglas Estuary, Lough Beg, Whitegate Bay and the Rostellan inlet (The site synopsis for Cork Harbour SPA is included in Appendix 1). Cork Harbour is of international importance for wintering waterfowl as it regularly supports in excess of 20,000 birds and is one of the top five wintering sites in the country. It supports internationally important numbers of redshank (5 year mean = 1,614) along with nationally important numbers of a further 15 species. A nationally important common tern (Annex I listed) breeding colony is also present (maximum of 102 pairs in 1995), and in addition the site hosts numerous Annex I listed species (including whooper swan, golden plover, bar-tailed godwit, ruff and little egret).

2.4 Identification of potential impacts

Only those development features that have the potential to impact on features and conservation objectives of the identified Natura sites are considered. A number of factors were examined at this stage and dismissed or carried forward for appropriate assessment as relevant. The following areas were examined in relation to potential impacts from the proposed scheme on the SPA in the area:

- Direct and indirect loss of habitats
- Disturbance to habitats
- Disturbance to species
- Water Quality
- Air Quality
- Hydrological changes

Direct and indirect loss of habitats

There will be no loss of habitat within any designated areas as a result of the proposed scheme. The scheme entails infilling a limited area of intertidal habitat within the proposed marina location and the dredging of seabed in the shallower parts of the marina but these areas are outside of the SPA.

Disturbance to habitats

There is a potential risk of causing some disturbance to habitats within the designated area network during the construction phase of the proposed marina, in particular during dredging works. Suitable material (sands and gravels) will be re-used as fill in the reclaimed platform while finer sediments will be disposed of at sea within defined dump sites under licence by the Environmental Protection Area. Sediment plumes arising from dredging activities may result in increased deposition within the Monkstown Bay area. There is also a risk that contaminants within the dredged sediments could be released into the food chain as a result of dredging works. However, the risk of negative impacts is not considered significant as the substrate within the area proposed for dredging is of a smooth and sticky consistency that would not be prone to suspension. Analysis of sediments from within the proposed areas for dredging found all levels to be below guidance levels (as per Cronin et al, 2006) for the full suite of parameters examined (see Results of Analysis in Appendix 1).

Over the lifetime of the Marina, periodic maintenance dredging will be required. The frequency will be dependant on rates of settlement but is expected to occur once every 10 years and require the removal of approximately 15,000m^3 of material.

In summary, no negative impacts are anticipated on any habitats within the designated area network as a result of the proposed development.

Disturbance to Birds

There is a potential for disturbance to wintering birds within Monkstown Creek as result of activities both during construction and operation of the proposed marina. A wide variety of wintering waterfowl utilise the mudflats of Monkstown Creek for feeding during low water. Wintering waterfowl populations are at highest during the period November to April (Boland et al, 2008). The birds are typically spread over a large area becoming more concentrated as the tide floods in confining the birds into a narrower area of shoreline. During high tide most birds disburse to feed at other locations or to roost. The tolerance of waders and waterfowl to human disturbance has received little study in Ireland but the presence of large wintering bird populations within the urban centres of Cork, Dublin, Galway and in close proximity to other large urban centres throughout the country testifies to their ability to accommodate considerable levels of human activity. Phalan and Nairn (2007) have recorded disturbance to shelduck and light-bellied Brent geese from pedestrians and in particular, dogs in Sandymount Strand. The mudflats in Monkstown Creek are however, unsuited to pedestrian activity and no such increase in pedestrian use is expected as a result of the proposed Marina.

The activities associated with construction of the Marina will be confined to the proposed site and undertaken primarily during the summer period when the wintering waterfowl and wader populations are on summer breeding grounds and are not in the vicinity of the proposed marina. No disturbance is anticipated to resident breeding species such as shelduck, cormorant, heron, etc which would tend to be more widely dispersed during the summer period. The breeding colony of Annex I common tern within Cork Harbour are remote from the proposed marina location and no impact would occur to this species arising from the proposed development. Noise levels associated with construction activities are not expected to be significantly elevated over typical background levels associated with Cork Harbour as a mixed urban and industrial environment.

The EIS submitted with the planning application advised the Council that background noise levels in the area were already relatively high and that construction activities would be constrained and mitigated to minimise impacts on the area. The EIS advised that "it is considered that noise impacts on the receiving environment will remain within the community noise exposure range of 65 – 75dB $L_{Aeq,\ 1\ Hour}$ at all NSR locations" during construction phases. Background noise levels in the area were already identified as being relatively significant due to road traffic in the area. Table 11.3 of the EIS presented Day and Night Noise Survey Results (copied below).

Table 1. Day & Night time Noise Survey Results

Monitoring Location	Survey Time	$L_{Aeq\ 30\ mins}$ dB	$L_{A10,30\ mins}$ dB	$L_{A90,30\ mins}$ dB	Description of Sources
DAYTIME NOISE SURVEY RESULTS - 31/03/2009					
NSR-1	14:53	68	71	45	Road traffic noise constant & dominant, birdsong, occasional passing boat engine audible
NSR-2	15:31	69	73	48	Road traffic noise constant & dominant, occasional passing boat engine audible

NSR-3	16:05	70	74	50	Road traffic noise constant & dominant, birdsong, occasional dog barking, occasional passing boat engine audible
NIGHTTIME NOISE SURVEY RESULTS - 01/04/2009					
NSR-1	22:00	61	64	40	Regular passing traffic dominant, occasional passing boat engine audible.
NSR-2	22:23	66	67	40	Regular passing traffic dominant
NSR-3	22:38	63	67	40	Regular passing traffic dominant

L_{Aeq} is the A-weighted equivalent continuous steady sound level during the sample period and effectively represents an average value.

L_{A10} is the A-weighted sound level that is exceeded for 10% of the sample period and is typically used to quantify traffic noise.

L_{A90} is the A-weighted sound level that is exceeded for 90% of the sample period and is used to quantify background noise in the absence of the main noise source.

Given the existing use of the area for boat mooring and the presence of a main road, the Noise Assessment contained in the EIS only predicted an increase due to additional traffic in the range of +0.1 – 0.2 dBa between 2011 and 2026. Section 11.37 of the EIS submitted detailed measures for the operational phase that will be required of users to ensure that noise impacts from the proposed development are minimised (These measure are detailed in Section 3.5.2 below).

The Marina will result in an increase in recreational activity in the area, though the scale of increase is limited as the areas already experiences high levels of activity associated with the existing Monkstown pier and mooring facilities (the proposed Marina will in part replace these facilities). The increase in activity associated with the Marina will almost exclusively occur during the late spring to autumn periods thereby reducing potential conflict with wintering bird populations. Boat traffic emanating associated with the Marina will generally be commuting to or from the Marina to the outer harbour or beyond. All craft within Cork are governed by the existing 5knot speed restriction. Boat activity within Monkstown Creek will be very limited due to the shallow ground and is likely to be confined to small sailing dinghies during periods of high water.

Given the above, there should be no significant disturbance to waders or waterfowl as a result of noise (given the tolerance of avifauna to the existing background noise levels coupled with the proposed mitigation measures) or increased recreational activities.

Disturbance to Marine Mammals

Otter (Annex II listed species under the EU Habitats Directive) occur within Monkstown Creek and throughout Cork Harbour. However, there are no holt, couch or other regularly used sites within or in the vicinity of the proposed Marina location, though regular passage of animals does occur in the area. Otter activity in urban areas primarily occurs from dusk through till dawn, with otters seeking secluded areas to lie-up during the day time. As construction activities for the proposed Marina will be confined to normal working hours, no direct conflict or disturbance to otter is anticipated. During operation, the infrastructure of the Marina (including rock armoury, landscaped "loafing" island, etc) may offer potential lie-ups and even holt sites for the species. The marina

infrastructure will also act as an artificial reef resulting in an increase in potential prey such as fish and other marine organisms.

Marine mammal activity within the Cork Harbour and in the vicinity of Monkstown is limited to small numbers of grey and common seal activity (both Annex II listed species under the EU Habitats Directive). There are no known regular haulouts for seals of either species within Cork Harbour (Cronin et al, 2003; Ó Cadhla et al, 2005) and no impact is expected with either species during construction or operation. Similarly, there is no regular occurrence of any cetacean species within Cork Harbour and no impacts are anticipated on this group of mammals as a result of either construction or operation of the Marina.

A limited amount of piling will be required during construction which. Given the limited number of piles anticipated in the proposal, the impact will be short term and in view of the limited potential for marine mammal activity in the area, is considered inconsequential. Nonetheless, pile-driving activities will be undertaken following standard mitigation for marine mammals under the guidance of Marine Mammal Observer

Given the above, no impacts are anticipated on marine mammals from the proposed Marina.

Water Quality

There is a risk of impacts on water quality within the Cork Harbour SPA area resulting from construction and operation of the scheme. Sediment analysis undertaken on a number of core samples from the areas proposed for dredging (Cronin Millar Consulting Engineers, 2010) have shown no elevated levels of any likely contaminants from such an environment (see Disturbance to Habitats and Results of Analysis in Appendix 2). Dredging activities will therefore not result in the release of potential contaminants from sediments. Any material in suspension will be innocuous in nature and will not be atypical for such an estuarine environment. Given the above, proposed mitigation measures are not considered necessary.

Hydrological changes

There is a risk of alteration of the hydrological regime within the adjacent Monkstown Creek element of Cork Harbour SPA resulting from construction of the proposed Marina. The potential impacts of the proposed development on the tidal regime, sediment transport and coastal processes in the area surrounding the development were investigated by Cronin Millar Consulting Engineers using the DYNLET 1 Dimensional numerical hydrodynamic model. The location of the proposed development is an area where the river velocity decreases substantially due to the plan form of the river/estuary and the topography of the area. Monkstown Creek is a natural deposition area for the river sediments due to this velocity decrease. The footprint of the proposed development is at the upstream edge of this depositional area.

The proposed development involves the reclamation of foreshore for the purposes of providing a platform for the landside element of the project. The results of the hydrodynamic modeling showed that the construction of the reclaimed platform would have a very minimal impact on the current velocities in the area, with a potential maximum increase in flow velocity of 0.04m/s. This impact is negligible given that the existing maximum flow in the area, as predicted by the model is less than 0.3m/s. Based on the composition of the seabed, it is unlikely that any significant accretion or erosion will occur as a result of the development.

2.4 Conclusion

It can be concluded that there are potential risks of direct and indirect impacts on the Monkstown Creek element of Cork Harbour SPA associated with the proposed Marina Development if mitigation is not employed.

On this basis, the screening stage has concluded to proceed to Stage 2: Appropriate Assessment to determine the impact of the proposed scheme in isolation and in combination with other plans or projects.

3. STAGE 2: APPROPRIATE ASSESSMENT

3.1 Stage 2A - Description of the Designated Areas

In this section the Natura 2000 sites selected for appropriate assessment are described briefly and all the potential impacts resulting from the proposed scheme are discussed in relation to the conservation objectives of the sites. The designated area boundaries relative to the proposed Marina location are shown in Figure 1.

3.1.1 Cork Harbour SPA (Site code no. 004030)

The Monkstown Creek pNHA (site No. 001979) has been subsumed into the Cork Harbour SPA (SPA No. 004030) as it was originally designated on account of its importance for wintering waterfowl. Monkstown Creek forms an isolated element of the SPA which comprises most of the main intertidal areas in Cork Harbour including all the North Channel, the Douglas Estuary, Lough Beg, Whitegate Bay and the Rostellan inlet.

Cork Harbour is of international importance for wintering waterfowl as it regularly supports in excess of 20,000 birds and is one of the top five wintering sites in the country. It supports internationally important numbers of redshank (5 year mean = 1,614) along with nationally important numbers of a further 15 species. A nationally important common tern (Annex I listed) breeding colony (maximum of 102 pairs in 1995) is also present, and in addition the site hosts numerous Annex I listed species (including whooper swan, golden plover, bar-tailed godwit, ruff and little egret).

Conservation Objectives Cork Harbour SPA

In the absence of conservation management plans for this SPA, the conservation objectives can be considered to include maintaining and restoring the favourable conservation status of the habitats and species for which the sites was selected (i.e. qualifying interests).

3.2 Stage 2B - Description of the project

The proposed development will entail the reclamation of a strip of land east of Monkstown Village to accommodate parking and infrastructural elements of the project, along with an extensive system of floating pontoons and jetties to accommodate 285 boat moorings. Dredging of the shallower areas within the footprint of the proposed development will be required.

The proposed marina will result in the permanent loss of a strip of intertidal habitat associated with the land-based element of the development (car-parking, retail, office and landscaping). There will be a requirement to dredge part of the seabed in the shallower parts of the marina and in a band paralleling the shore to enable safe access by craft during all states of the tide, which will result in the localized loss of the marine biota. The depth of dredging will vary throughout the site depending on the size/depth of vessel throughout the marina, in an attempt to minimize the amount of dredging required. The dredging will be carried out to between -3.73 CD to -5.93 CD. An estimated 70,000m^3 of sediment will be dredged from the Marina area. It is proposed to over dredge the basin by approximately 0.5m, to increase the period between maintenance dredging operations. The total estimated volume of material to be dredged as part of the maintenance campaign is approximately 15,000m^3 of material every ten years.

3.3 Stage 2C - Potential impacts on the integrity of the Designated Areas

Cork Harbour SPA is designated as it is of international importance for wintering waterfowl, regularly supporting in excess of 20,000 birds and is one of the top five wintering sites in the

country. No impacts are anticipated on the utilisation of Monkstown Creek by wintering waterfowl and waders and therefore, no impact is anticipated on any of the qualifying interests or the integrity of Cork Harbour SPA or Monkstown Creek pNHA.

3.4 Stage 2D - Analysis of "in combination" effects

The consideration of in combination effects has been limited to the geographical extent of the environs in the general vicinity of the proposed scheme (approx 10km radius), with focus on the Monkstown Creek pNHA and Cork Harbour SPA. A literature search has produced no evidence of currently proposed projects that could result in "in combination" effects with the proposed Marina. An application for a port development at Oyster Bank was recently refused permission. The redevelopment of Passage West town centre, including a 270 berth marina, was refused permission by An Bord Pleanala in 2009. No negative impact is therefore anticipated on any of the qualifying interests or integrity of Monkstown Creek pNHA and Cork Harbour SPA as a result of "in combination" effects.

3.5 Stage 2E - Impact Mitigation

3.5.1 Mitigation through avoidance

The location of the scheme avoids any of the known feeding and roosting sites for wintering or breeding waterfowl and waders for which Cork Harbour SPA has been designated.

3.5.2 Mitigation during Construction and Operation

A suite of measures has been prescribed within the Environmental Report prepared for the proposed Marina (EirEco, 2009) aimed at avoiding impacts on the marine environment. These include:

Construction Phase:

1. Construction will take place outside of main wintering period for waterfowl and waders thus minimising the risk of disturbance.

2. The marina will be designed and operated in accordance with the Blue Flag for Marinas Programme (as administered by An Taisce).

3. All construction works in the marine environment will be carried out in accordance with CIRIA Guidance No C584 " *Coastal and Marine Environmental Site Guide*".

4. Throughout all stages of the construction phase of the project the contractor shall ensure that good housekeeping is maintained at all times and that all site personnel are made aware of the importance of the associated marine environment and in particular Monkstown Creek SPA/pNHA and the requirement to avoid pollution of all types.

5. An emergency-operating plan shall be established to deal with incidents or accidents during construction that may give rise to pollution within Cork Harbour. This will include means of containment in the event of accidental spillage of hydrocarbons or other pollutants (including oil booms and soakage pads).

6. The storage of oils, hydraulic fluids, etc will be undertaken in accordance with current best practice for oil storage (Enterprise Ireland, BPGCS005).

7. The pouring of concrete, sealing of joints, application of water-proofing paint or protective systems, curing agents, etc will be completed in the dry to avoid pollution of the marine environment.

8. Dredging operations will be limited to the ebb cycle of the tide to ensure that any suspended sediment will be carried out into the main river channel. The dredge arisings will be disposed of via two routes. Suitable material will be used as fill for the reclaimed platform, while the unsuitable silts will be dumped at sea at the licensed dredge site outside Cork Harbour subject to the granting of a foreshore license and dumping at sea license by the Department of Agriculture, Fisheries & Food.

9. It is expected that construction activities, as detailed in the Dredging Environmental Report (CMCE, 2010), will not have an impact on marine Mammals. Section 4.1.1 of that report states that the proposal will only employ underwater dredging and that no rock will be dredged. Dredging is an occasional occurrence within Cork Harbour.

10. The introduction of rock amour and fill to the site will occur at a low tide and therefore disturbance to the marine environment will be minimized. Piling will occur on only a very limited basis, i.e. as part of the pontoon provision, and will be undertaken with standard mitigation for marine mammals under the guidance of Marine Mammal Observer.

11. Monitoring of the above will be the responsibility of the Appointed Construction Site Manager and the Client. The proposed measures are expected to be successful. However, if Marine Mammals are identified in the Harbour during construction and are observed to be disturbed by the construction methodology, piling will cease until they have left the harbour area.

Operation Phase:

12. Due to the ecological sensitivities of Cork Harbour and the proximity of the proposed marina to the SPA/pNHA, users of the marina will be informed by appropriate signage, as well as part of their membership package, of ways to avoid disturbance or damage to habitats and species. This will include notification of speed zones, sensitive areas, and obligations to safe-guarding the environment. Best practice will be adopted in the Marina to promote environmental awareness amongst Marina users including sensitivity to bird life, adoption of Codes of Practice including those for Cetacean encounters and Leave no Trace.

13. The risk of accidental transfer of the non-native invasive species will require adherence to current best practice protocol for avoiding their spread or transfer (example listed below for zebra mussels: http://www.galway.ie/en/Services/Environment/alienspecies). These measures will be enforced during construction to ensure accidental spread does not occur on machinery or materials from the site. The Marina will also adopt any modified or updated approaches to invasive alien species control.

14. Wastewater from the Marina will be discharged to the Monkstown wastewater treatment facility. All foul waste, including that from boats, will be discharged to the treatment facility. A storage capacity of 24 hours will be developed to cover periods of power failure.

15. Grease traps will be installed as appropriate to ensure that grease, fats or other lipids are contained for appropriate licensed disposal and do not enter the municipal foul sewer system.

16. All surface water generated by the land-based element of the development will be collected in a sealed system via gullies and down-pipes from the hard-standing and roofed areas respectively. Given the location of the development particular detail has been given to how to treat the storm-water accordingly prior to discharge to Cork Harbour. The following approach is proposed to minimise the impact on the marine environment:

- Roofed areas will discharge via trapped gullies with debris sumps directly to Cork Harbour, as they contain no contaminants.
- Road areas will discharge to trapped gullies with debris sumps prior to discharge to Cork Harbour.
- Car parking will discharge via By-Pass Petrol Interceptors (Class I) to Cork Harbour.

17. Idle boat engines should be switched off.

18. Lanyards for sail boats will be secured and fastened while berthed to prevent 'frapping'.

19. All machinery such as boilers, coolers pumps etc. will be maintained in good working order with regular scheduled maintenance checks.

20. Deliveries will only take place during daytime hours where practicable.

21. Where night-time deliveries to the provision shop are unavoidable, these will be kept to a minimum and all efforts will be undertaken to ensure noise emissions are minimised.

22. An on-site speed limit will be enforced for all traffic.

23. Commercial drivers will be advised to switch off idling engines and to avoid unnecessary revving.

24. Whenever possible, positioning stationary noise sources such as generators and compressors as far away as possible from noise sensitive areas should be considered. Temporary barriers can be employed and/or enclosures can be built around noisy equipment.

25. Where possible pumps and compressors will be housed internally within buildings that offer acoustic absorption.

26. The interior plant layout and design will be constructed to minimise potential noise sources, and where applicable will used to reduce noise output.

27. Any machines in intermittent use will be shut down in the intervening period between works or throttled down to a minimum.

Enhancing Biodiversity:

The Council has advised that it strongly encourages the applicant to explore opportunities for enhancing biodiversity in the design of the project. The applicant has identified a number of methods by which the proposal can provide for enhanced biodiversity.

- Passive provision will be provided by the design of the proposal rock amour surrounding to provide a habitat for marina flora and fauna.
- Additional loafing islands are also identified in the revised drawings now submitted as part of the Further Information response. These will provide potential breeding and roosting habitat for birds. The marina infrastructure itself is also expected to provide roosting and foraging habitat for various species including cormorant, gull species and heron.
- Active interventions to encourage marine species will be provided through incorporation of "Pipe and Chamber" otter holts in the loafing island.

4. CONCLUSION

The proposed Marina at Monkstown will not result in the loss of any feeding areas or roosting sites for wintering waterfowl or waders. There will therefore, be no impact on the qualifying interests for Cork Harbour SPA or on the integrity of the SPA.

There will be no negative impacts on marine mammals (including otters).

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APPENDIX 1

SITE SYNOPSIS
CORK HARBOUR SPECIAL PROTECTION AREA

SITE CODE: 004030

Cork Harbour is a large, sheltered bay system, with several river estuaries – principally those of the Rivers Lee, Douglas and Owenacurra. The SPA site comprises most of the main intertidal areas of Cork Harbour, including all of the North Channel, the Douglas Estuary, inner Lough Mahon, Lough Beg, Whitegate Bay and the Rostellan inlet.

Owing to the sheltered conditions, the intertidal flats are often muddy in character. These muds support a range of macro-invertebrates, notably *Macoma balthica*, *Scrobicularia plana*, *Hydrobia ulvae*, *Nepthys hombergi*, *Nereis diversicolor* and *Corophium volutator*. Green algae species occur on the flats, especially *Ulva lactua* and *Enteromorpha* spp. Cordgrass (*Spartina* spp.) has colonised the intertidal flats in places, especially where good shelter exists, such as at Rossleague and Belvelly in the North Channel. Salt marshes are scattered through the site and these provide high tide roosts for the birds. Salt marsh species present include Sea Purslane (*Halimione portulacoides*), Sea Aster (*Aster tripolium*), Thrift (*Armeria maritima*), Common Saltmarsh-grass (*Puccinellia maritima*), Sea Plantain (*Plantago maritima*), Lax-flowered Sea-lavender (*Limonium humile*) and Sea Arrowgrass (*Triglochin maritima*).

Some shallow bay water is included in the site. Cork Harbour is adjacent to a major urban centre and a major industrial centre. Rostellan lake is a small brackish lake that is used by swans throughout the winter. The site also includes some marginal wet grassland areas used by feeding and roosting birds. Cork Harbour is an internationally important wetland site, regularly supporting in excess of 20,000 wintering waterfowl, for which it is amongst the top five sites in the country. The five-year average annual core count for the entire harbour complex was 34,661 for the period 1996/97-2000/01. Of particular note is that the site supports an internationally important population of Redshank (1,614) – all figures given are average winter means for the 5 winters 1995/96-1999/00. A further 15 species have populations of national importance, as follows: Great Crested Grebe (218), Cormorant (620), Shelduck (1,426), Wigeon (1,750), Gadwall (15), Teal (807), Pintail (84), Shoveler (135), Red-breasted Merganser (90), Oystercatcher (791), Lapwing (3,614), Dunlin (4,936), Black-tailed Godwit (412), Curlew (1,345) and Greenshank (36). The Shelduck population is the largest in the country (9.6% of national total), while those of Shoveler (4.5% of total) and Pintail (4.2% of total) are also very substantial. The site has regionally or locally important populations of a range of other species, including Whooper Swan (10), Pochard (145), Golden Plover (805), Grey Plover (66) and Turnstone (99). Other species using the site include Bat-tailed Godwit (45), Mallard (456), Tufted Duck (97), Goldeneye (15), Coot (77), Mute Swan (39), Ringed Plover (51), Knot (31), Little Grebe (68) and Grey Heron (47). Cork Harbour is an important site for gulls in winter and autumn, especially Common Gull (2,630) and Lesser Black-backed Gull (261); Black-headed Gull (948) also occurs.

A range of passage waders occur regularly in autumn, including Ruff (5-10), Spotted Redshank (1-5) and Green Sandpiper (1-5). Numbers vary between years and usually a few of each of these species over-winter. The wintering birds in Cork Harbour have been monitored since the 1970s and are counted annually as part of the I-WeBS scheme. 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 a Martello Tower. The birds are monitored annually and the chicks are ringed.

Extensive areas of estuarine habitat have been reclaimed since about the 1950s for industrial, port-related and road projects, and further reclamation remains a threat. As Cork Harbour is adjacent to a major urban centre and a major industrial centre, water quality is variable, with the estuary of the River Lee and parts of the Inner Harbour being somewhat eutrophic. However, the polluted conditions may not be having significant impacts on the bird populations. Oil pollution from shipping in Cork Harbour is a general threat. Recreational activities are high in some areas of the harbour, including jet skiing which causes disturbance to roosting birds.
Cork Harbour has is of major ornithological significance, being of international importance both for the total numbers of wintering birds (i.e. > 20,000) and also for its population of Redshank. In addition, there are at least 15 wintering species that have populations of national importance, as well as a nationally important breeding colony of Common Tern. Several of the species which occur regularly are listed on Annex I of the E.U. Birds Directive, i.e. Whooper Swan, Golden Plover, Bar-tailed Godwit, Ruff and Common Tern. The site provides both feeding and roosting sites for the various bird species that use it.

APPENDIX 2.

RESULTS OF SEDIMENT ANALYISIS FROM AREA PROPOSED FOR DREDGING

(Taken on 12th February 2010)

Analyte	*Units*	Monk-1-10	Monk-2-10	Monk-3-10	Monk-4-10
Density	g/ml	1.72	1.55	1.42	1.82
Dry Solids @ 105°C	%	61.3	44.2	44.3	62.7
Loss on Ignition @ 500°C	%	4.83	8.24	9.13	6.13
Total Organic Carbon (TOC) : Dry Wt as C	%	1.02	1.75	1.88	<0.800
Grain Size : 4000 to 7999 microns	%	0	3.36	0	11.8
Grain Size Fraction : 1000 to 2000 microns	%	0	0	0	0.91
Grain Size Fraction : 125 to 249 microns	%	11.4	1.9	0.66	0.93
Grain Size Fraction : 2000 to 3999 microns	%	0	0	0	1.24
Grain Size Fraction : 250 to 499 microns	%	2.92	1.92	0.02	0.75
Grain Size Fraction : 500 to 999 microns	%	0.15	0.42	0	0.74
Grain Size Fraction : 63 to 125 microns	%	19.6	1.82	2.92	1.43
Grain Size Fraction : < 20 microns	%	41.4	39.3	75.1	29.2
Grain Size Fraction : < 63 microns	%	66	51.9	96.4	37.6
Grain Size Fraction : > 8000 microns	%	0	37.6	0	43.2
Grain Size Inclusive Kurtosis	mm	0.574	0.712	0.483	0.702
Grain Size Inclusive Mean	mm	0.028	0.142	0.011	0.818
Inclusive Graphic Skewness :- {SKI}	Unitless	-0.1	0.36	0.01	-0.93
Kurtosis	Unitless	7.81	-1.79	26.1	-1.86
Particle Diameter : Mean	mm	0.061	3.85	0.017	4.92
Particle Diameter : Median	mm	0.031	0.05	0.01	7.44
Sorting Coefficient	Unitless	2.01	4.44	1.42	4.32
Mercury : Dry Wt	mg/kg	0.156	0.082	0.098	0.014
Aluminium : Dry Wt	mg/kg	19300	17800	21600	13900
Arsenic : Dry Wt	mg/kg	4.69	6.08	7.88	5.76
Cadmium : Dry Wt	mg/kg	0.175	0.184	0.249	0.114
Chromium : Dry Wt	mg/kg	27.4	29	34.3	22.5
Copper : Dry Wt	mg/kg	11.9	18.6	18.8	10.3
Lead : Dry Wt	mg/kg	23	34.6	31.1	18.6
Lithium : Dry Wt	mg/kg	27.2	31.2	34	22.8
Nickel : Dry Wt	mg/kg	15.6	17.3	19.5	16.4
Zinc : Dry Wt	mg/kg	80.4	88	98.9	61.7
Dibutyl Tin : Dry Wt as cation	ug/kg	<5.00	<6.00	<7.00	<4.00
Tributyl Tin : Dry Wt as cation	ug/kg	<5.00	<6.00	<7.00	<4.00
Dry Solids @ 30°C	%	61.1	49.8	41.7	76.1