MERC Consultants
environmental and conservation services

Report to Inform Screening for Appropriate Assessment

Deployment of nine Acoustic Doppler Current Profilers within Cork Harbour and environs.

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1. Introduction

Irish Water wish to conduct a strategic modelling study of water currents within Cork Harbour and its environs. The study requires the deployment of nine (9) Acoustic Doppler Current Profilers (ADCPs) at various locations within the area to provide the data required to conduct the modelling. Ancillary instruments, to collect salinity and temperature data, may also be contained within the trawl resistant frame in which the ADCPs will be deployed. This document represents a report to inform screening for Appropriate Assessment of the potential impacts of the proposed deployments within Cork Harbour and its environs on European sites.

2. Statement of authority

MERC are a specialist marine ecological survey and consultancy firm. Core staff have more than 60 years of combined experience and specialist knowledge in relation to Irish aquatic habitats and species in addition to the assessment and management of conservation interests.

MERC were responsible for preparing the NPWS national monitoring of marine Annex I habitats for compliance under Article 17 of the EU Habitats Directive. In this context MERC were responsible for the assessment and reporting of marine Annex I habitats in Ireland and were the authors of all Article 17 reports and overarching site monitoring reports.

In addition to their scientific expertise MERC have an in-depth knowledge of Irish and European Environmental legislation and policy. In 2011 MERC prepared the text describing Activities Requiring Consent (ARCs) for inclusion in a handbook detailing the regulatory framework for all developments within designated sites in Ireland on behalf of the National Parks and Wildlife Service. They have also produced numerous Conservation Management Plans for the same department. To-date MERC have conducted in excess of 200 ecological reports in support of Appropriate Assessment under Article 6(3) of the EU Habitats Directive.

3. Methods

3.1 Relevant guidelines and legislation

This report has been prepared with reference to the following European Directives, national legislation and guidance on the appropriate assessment of projects and plans with regard to the implementation of the provisions of Article 6(3) and (4) of the EU Habitats Directive 92/43/EEC.

- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild flora and fauna. Official Journal of the European Communities.
- Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (codified version).
- European Communities (Birds and Natural Habitats) Regulations 2011. SI No. 477 of 2011.
- Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC. European Commission 2018. 7621 final. Office for Official Publications of the European Communities, Luxembourg.

- Assessment of plans and projects significantly affecting Natura 2000 sites; Methodological Guidance on the provisions of Articles 6(3) and (4) of the Habits Directive 92/43/EEC. European Commission, 2002;
- Appropriate Assessment of Plans and Projects in Ireland, Guidance for Planning Authorities. DoEHLG, 2009.
- Appropriate Assessment Screening for Development Management. OPR Practice Note PN01. Office of the Planning Regulator. March 2021.
- Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters. Department of Arts, Heritage and the Gaeltacht, 2014.
- Relevant case law.

3.2 Description of the proposed project and its associated scope of works

A description of the proposed project was compiled and is set out in section 4. The description details all works required to carry out the proposed project.

3.3 Description of the receiving environment

To fully understand the receiving environment, relative to project related effects, the literature consulted included the available National Parks and Wildlife Service data sources for all Natura 2000 sites within the zone of influence (see section 3.4) of the proposed project. This included the individual site synopsis for European sites, standard Natura 2000 data forms, conservation objectives and GIS layers (habitats and species). Further data was obtained from:

- INFOMAR bathymetric mapping
- INFOMAR sediment classification
- Water Framework Directive benthic monitoring programme
- NPWS Marine monitoring data
- BirdWatch Ireland I-Webs data
- Biodiversity Data Centre species maps

3.4 Impact assessment approach

The zone of influence (ZOI) of a project is the area over which ecological features may be affected by biophysical changes as a result of the proposed project and associated activities. In the context of Appropriate Assessment Screening, the ZOI is the area over which a plan or project could affect the receiving environment such that it could potentially have significant effects on the conservation status of European Sites. Within the ZOI those receptors that are sensitive to change must be identified and considered.

To define the ZOI of a project the potential for project related effects on sensitive receptors must first be established. For this purpose, a **Source-Path-Receptor-Consequence (SPRC)** model was applied. The SPRC model is a well-established model frequently applied to the analysis of project related impacts on ecosystems and is the one which we have applied to the assessment of the proposed project.

Using this approach all elements of the proposed project were reviewed to assess potential pathways and receptors which might be affected so that a ZOI could be established. This process involved the following steps:

- The identification of sources of potential impacts and their pathways from the proposed project site to European Sites.
- Consideration of sensitive receptors and their dependent ecosystems within the aforementioned European sites.
- Identifying and characterising project related impacts and their likely effects, direct, indirect and cumulative on the identified sensitive receptors.

Once the ZOI was established, the following steps were taken to assess the potential for likely significant effects on sensitive receptors:

1. The scale and scope of the project was examined.
2. A desk review of the available literature describing the habitats and species known to occur at the proposed project site and surrounding area was undertaken.
3. Any project related activities likely to affect migratory or highly mobile species was considered.
4. Any use of the proposed project site by mobile species that make regular movements to, from, or across the site was assessed.
5. An assessment was carried out of the key ecological processes and species activity periods including seasonal variations in distribution, abundance and activity.

3.5 Review of relevant European Sites

Once the ZOI of the proposed project was determined European sites within this ZOI were documented and an analysis of the sensitivity of ecological receptors therein was conducted. In determining the sensitivity of ecological receptors consideration was given to the scale, scope and location of the proposed project relative to the aforementioned receptors.

4. Details of the proposed project

4.1 Scope of works

The project consists of the deployment of up to nine (9) ADCPs within Cork Harbour and its environs at the locations given in table 4.1 and shown in figure 4.1

Table 4.1. Proposed locations of ADCPs

ADCP No.	Easting (ITM)	Northing (ITM)
1	580796.654	559226.648
2	582868.367	559775.389
3	581269.049	562562.210
4	582354.176	565567.551
5	577377.024	565915.600
6	577264.286	566379.636
7	581513.895	566640.300
8	586114.924	569592.009
9	576819.976	569626.361

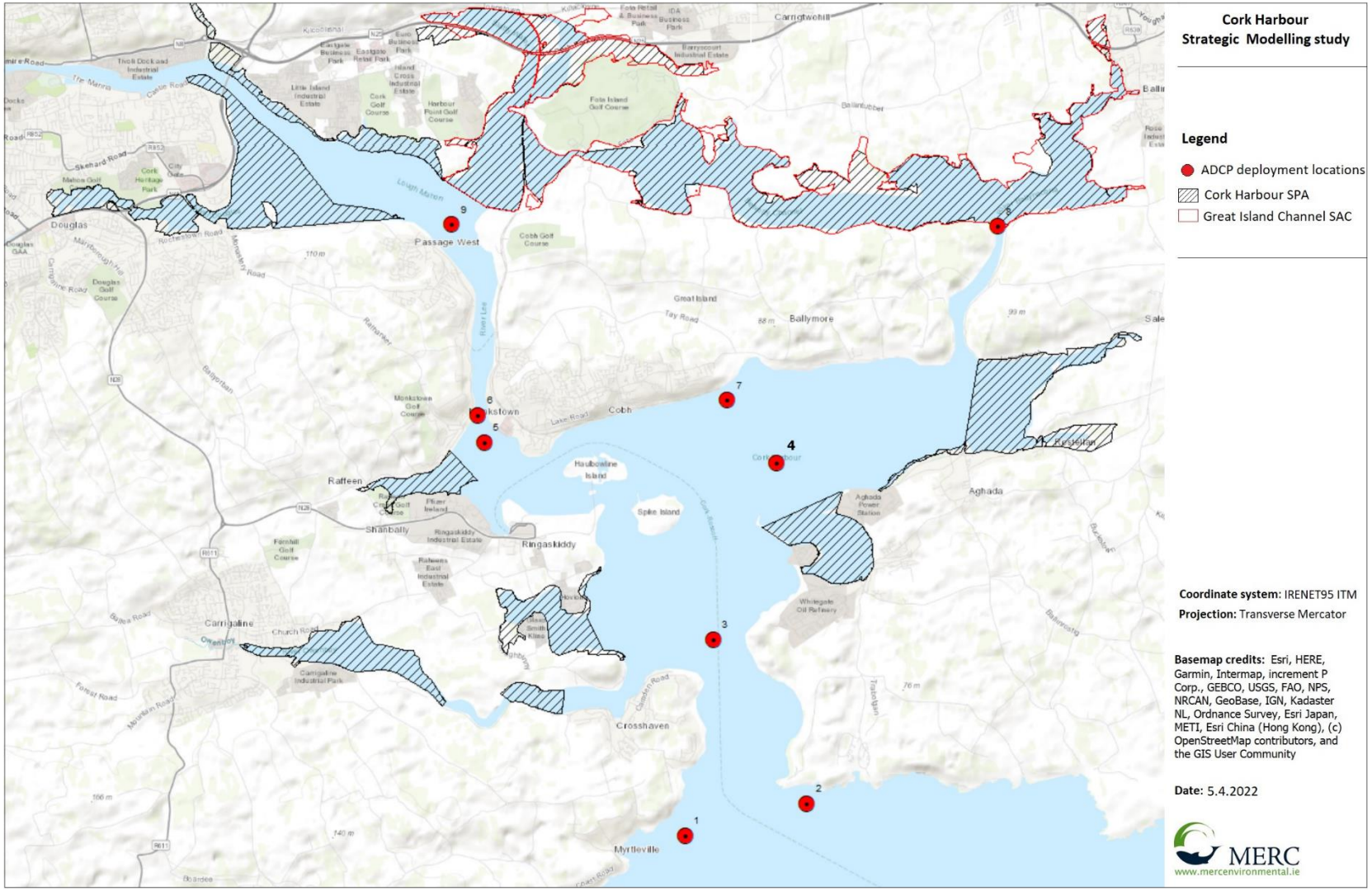

Figure 4.1. Proposed locations of ADCPs.

An Acoustic Doppler Current Profiler (ADCP) is a hydroacoustic current meter used to measure water current velocities over a depth range using the doppler effect of sound waves scattered back from particles within the water column. In the present case ADCPs operating in the range of 600 Khz or 1 Mhz will be used. The instrument emits "pings" of sound at a sampling rate of 1-minute average every 10 minutes.

The ADCP is contained within a trawl resistant bottom mount frame *circa* 1.8m x 1.3m x 0.6m with a weight of approximately 300kg. Figure 4.2 shows an image of a typical Frame within which the ADCP is contained. The frame is attached to a ground line, a clump weight and to an acoustic release system carrying a rope retrieval system. The frame also houses a recovery line attached to a small rigid buoy which is held in place by an acoustic release, which releases the buoy on command from a deck unit from a boat. Also housed within the frame is lead ballast to secure the frame to the seabed. Additional instrumentation to collect salinity and temperature data may also be contained within the frame. An acoustic pinger is also mounted on the frame to aid in the recovery of the frame in the event of the acoustic release not firing. The frame is deployed with a grapple hook and floating nylon line to serve as a backup means of recovery.

Figure 4.2 ADCP contained with frame

Deployment

The units will be deployed from the desk of a vessel onto the seabed, at the nine locations shown in figure 4.1, where they will remain fully submerged throughout the tidal range**.** Deployment is carried out by lifting the ADCP from the deck of the vessel via a deck crane or A-frame and winch.

Operation

During operation the units will emit "pings" of sound in the range of 600 Khz or 1 Mhz at a sampling rate of 1-minute average every 10 minutes. The ADCP will be left *in-situ* for the sampling duration which will be *ca.* 35 days.

Recovery

Recover is facilitated by a hydrostatic release which, on command, sends a ranging ping to the release mechanism which if successful releases a buoy connected to a recovery line. The vessel can then simply move into position over the buoy and recover the ADCP into the boat via the crane. On occasion hydrostatic releases fail. To overcome this issue the ADCPs are also fitted with acoustic pingers which can be activated to aid the location of the ADCP and the acoustic release then attempted again. If the release still fails to work the recovery is then attempted by a grapple recovery. This involves trawling a line with

a grapple attached across the seabed in the area where the deployment took place to snag the grapple line between the ADCP and grapple anchor.

5. Receiving environment

The nine proposed ADCPs to be deployed will be located within Cork Harbour and its environs (figure 4.1). Cork Harbour is one of the largest natural harbours in the world. The city of Cork is located on its north western boundary and a number of large towns, such as Middleton, Carrigaline and Cobh, are located around its perimeter. The immediate hinterland of Cork Harbour is also home to significant industrial and manufacturing facilities and an oil refinery located at Whitegate on the south eastern shore of Cork Harbour. The Port of Cork, located at Ringaskiddy, is a busy shipping port facilitating passenger and cargo ferries in addition to cruise facilitates and channel dredging. Cork Harbour is also home to the Irish naval base at Haulbowline and a number of sailing clubs including the Royal Cork Yacht Club at Crosshaven.

The River Lee and the Glashaboy River drain into Lough Mahon in the north west which in turn connects, via the west passage, into Cork Harbour. Great Island is separated from the mainland by two narrow stretches of water, the west passage and the Ballynacorra River and by an area of water sometimes referred to as Great Island Channel. Cork Harbour itself, is a large body of very shallow sheltered water in which Spike, Haulbowline and Corkbeg Islands are located.

Lough Mahon, Cork Harbour and Great Island Channel are all sheltered, predominantly shallow waterbodies. Regular maintenance dredging is required to maintain water depths into the port of Cork at Ringaskiddy so it remains navigable.

5.1 Ecology of the receiving environment

As described above, the majority of Lough Mahon, Cork Harbour and Great Island Channel is characterised by a sheltered, shallow seabed. Scour channels characterise the main river channels through the area and here heavily silted gravels are present. Elsewhere the seabed is dominated by muddy sediments in the subtidal areas and large expanses of intertidal mudflats.

Intertidal habitats

The intertidal area is characterised by extensive mudflats corresponding to the EU Annex I habitat "Mudflats and sandflats not covered by seawater at low tide [1140]". The mudflats across most of their area were sampled for macrofauna and sediment profiles in 2011 through a joint Marine Institute/National Parks and Wildlife Service baseline survey programme (Appendix 1). These data show that the intertidal sediments are largely comprised of muds with smaller pockets where sandy or gravelly muds present. The muds support a range of macro-invertebrates, notably *Tubificoides benedii, Hydrobia ulvae, Hediste diversicolor, Heterochaeta costata, Nephtys hombergii*, *Ampharete acutifrons*, *Scrobicularia plana* and the bivalve *Abra nitida.* However, species richness and diversity are not particularly high.

Small pockets of intertidal reef corresponding to the EU Annex I habitat Reefs [1170] occur around the margins of Cork Harbour and environs but such areas are very limited in their extent and distribution in part as a result of the highly modified shoreline surrounding extensive sections of the area.

Subtidal habitats

The dominant subtidal sediment types within the three main waterbodies (Lough Mahon, Cork Harbour and Great Island Channel) are sandy muds of varying degrees of coarseness depending on the degree of scour present. Appendix 2 details the Folk (1954) sediment classification for a number of stations sampled throughout the 3 main waterbodies and their connecting waterbodies. These data are derived from INFOMAR surveys, NPWS Article 17 monitoring and Water Framework Directive monitoring of the area in recent years. These data indicate the sediment type in the main navigational channel through Cork Harbour, between Spike Island and Carlisle Fort, is comprised of "Muddy sand", "Gravelly Mud", "Sandy mud" and "Gravelly sand". Lough Mahon and Great Island Channel are characterised by "Sandy Mud" .

The most recent series of Water Framework Directive sampling for Lough Mahon and Great Island Channel (2021 data) indicated species richness and diversity was relatively high in Great Island Channel compared to Lough Mahon which exhibited lower species diversity and abundance. This is likely a reflection of the coarser sediment profile within Great Island Channel.

No significant epifauna or any rare, unusual or sensitive species or habitats are associated with any of the subtidal habitats within the areas of the proposed nine deployments, or indeed elsewhere in Cork Harbour and its environs.

Subtidal reef is not recorded as present within the three main water bodies (locations of ADCP numbers 3-9). Outside of the mouth of Cork Harbour pockets of subtidal reef (Annex I habitat 1170) are recorded. The nearest recorded Reef to any of the proposed ADCP deployments is 300m east and also 300m west of ADCP number 1 and 500m southwest of ADCP 2 (INFOMAR shaded relief data).

Atlantic salt meadows (Glauco-Puccinellietalia maritimae)

Atlantic salt meadows, of the estuarine type, are present along the shorelines of Great Island Channel. They are predominantly concentrated around the shores of Foaty Island and the Owennacurra River Estuary south of Middleton. The typical characterising species include Sea Purslane (*Halimione portulacoides*), Sea Aster (*Aster tripolium*), Thrift (*Armeria maritima*), Common Saltmarsh-grass (*Puccinellia maritima*), Sea Plantain (*Plantago maritima*), Greater Sea-spurrey (*Spergularia media*), Lax-flowered Sea-lavender (*Limonium humile*), Sea Arrowgrass (*Triglochin maritimum*), Sea Mayweed (Matricaria maritima) and Red Fescue (*Festuca rubra*) (NPWS, 2013).

Avifauna

The intertidal mudflats of Cork Harbour and environs are extremely important for wintering waterfowl which utilise the macro-invertebrate component of the intertidal areas as a food source. Well in excess of 20,000 individuals use the site making it one of the top ten winter refuges for waterbirds in Ireland and an internationally important site for wintering waterfowl. BirdWatch Ireland, through the I-WeBS

programme, monitor the use of the area through a network of over 20 monitoring stations on an annual basis every winter. With the exception of the limit use of the site by terns, the area is considered too shallow for regular use by diving seabirds, due to the shallow depths. Outside of the mouth of Cork Harbour (location of ADCPs 1 and 2) water depths are deeper and the potential of these areas to provide foraging habitat for diving seabirds connected with the tern colonies of Cork Harbour SPA and more distant SPA's is possible.

Marine mammals

The shallow nature of much of Cork Harbour (north of Rams Head/Carlisle Fort) make it unsuitable for the majority of marine mammals. Bottle-nosed Dolphin (*Tursiops truncatus*) are recorded from the mouth of Cork Harbour (location of ADCPs 1 and 2) and while there are some records for small groups having moved further into the Harbour this is not a common occurrence. Similarly, Harbour Porpoise (*Phocoena phocoena*) are recorded in the deeper waters south of Rams Head/Carlisle Fort and sporadic records for this species within Cork Harbour, where depths permit also exist (Biodiversity Data Centre, Accessed March 2022).

Records for both Common Seal (*Phoca vitulina*) and Grey seal (*Halichoerus grypus*) within Cork Harbour and its environs are rare with only very occasional sightings of single live animals recorded. No haul out resting or breeding places occur within the area. (Biodiversity Data Centre, Accessed March 2022).

6. Appropriate Assessment Screening

6.1 European Sites

Following a review of the project scope of works to include deployment, duration of deployment, static operation and retrieval methods, the ZOI of the proposed project is considered to include the habitat within the direct footprint of each ADCP and a buffer zone extending to 100m radius of each ADCP. This ZOI has been selected to account for sediment disturbance and scouring during deployment and retrieval and acoustic operation of each instrument. This ZOI is considered sufficient to account for any potential impacts resulting from the proposed project. The 100m radius is based on the topography and bathymetry and sediment profile in the areas surrounding each of the nine proposed deployments.

This ZOI has been decided based on the scale and scope of the project, hydrological corridors of connectivity (direct and indirect source-path-receptor links) and potential cumulative impacts for the duration of the proposed project. No source-path-receptor links have been identified between the proposed project and any European sites other than Great Island Channel SAC and Cork Harbour SPA. Therefore, with due consideration to the scale and scope of the project, impacts on the conservation objectives of Great Island Channel SAC and Cork Harbour SPA alone and in combination with other projects and plans have been considered. Impacts on additional European sites are not considered possible and have not been further considered in this report.

The features of interest for Great Island Channel SAC and the Special Conservation Interests (SCIs) for Cork Harbour SPA are provided in table 6.1.

Table 6.1: Features of interest and SCIs for sites considered to be within the zone of influence of the proposed project

Great Island Channel SAC (Site code: 001058)
Mudflats and sandflats not covered by seawater at low tide [1140]
Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330]
Cork Harbour SPA (Site code: 004030)
Little Grebe (Tachybaptus ruficollis) [A004]
Great Crested Grebe (Podiceps cristatus) [A005]
Cormorant (Phalacrocorax carbo) [A017]
Grey Heron (Ardea cinerea) [A028]
Shelduck (Tadorna tadorna) [A048]
Wigeon (Anas penelope) [A050]
Teal (Anas crecca) [A052]
Pintail (Anas acuta) [A054]
Shoveler (Anas clypeata) [A056]
Red-breasted Merganser (Mergus serrator) [A069]
Oystercatcher (Haematopus ostralegus) [A130]
Golden Plover (Pluvialis apricaria) [A140]
Grey Plover (Pluvialis squatarola) [A141]
Lapwing (Vanellus vanellus) [A142]
Dunlin (Calidris alpina) [A149]

Black-tailed Godwit (Limosa limosa) [A156]
Bar-tailed Godwit (Limosa lapponica) [A157]
Curlew (Numenius arquata) [A160]
Redshank (Tringa totanus) [A162]
Black-headed Gull (Chroicocephalus ridibundus) [A179]
Common Gull (Larus canus) [A182]
Lesser Black-backed Gull (Larus fuscus) [A183]
Common Tern (Sterna hirundo) [A193]
Wetland and Waterbirds [A999]

6.2 Impact prediction

This section identifies and considers potential impacts; direct and secondary, on the conservation status of the qualifying interests of Great Island Channel SAC and the Special Conservation Interests (SCIs) of Cork Harbour SPA. Direct and indirect impacts related to the project are discussed in section 6.2.1. Cumulative impacts are considered under section 6.2.2.

6.2.1 Direct and Indirect impacts

As described in section 3, the ZOI of a project is the area over which ecological features may be affected by biophysical changes as a result of the proposed project and associated activities. ADCP number 8 (Figure 4.1) is marginally inside of the boundary of Great Island Channel SAC and within 50 meters of the boundary of Cork Harbour SPA. All other ADCPs are outside of the boundaries of these two European sites.

Table 6.2 details the potential impacts of the proposed project relative to sensitive receptors identified within the ZOI of the proposed project.

Table 6.2 Identified sources of impact within the zone of influence and sensitive receptors.

Phase	Source (pressure)	Receptor
Deployment	**Sediment disturbance, mobilisation, benthic species damage** due to deployment of ADCPs on the sea bed.	Benthic habitats and species.
	Disturbance, harm or injury as a result of vessel operations	Marine mammals, Birds
Operation	**Disturbance, harm or injury as a result of underwater noise** related to ADCP operation.	Marine mammals
Recovery	**Sediment disturbance, mobilisation, compaction, benthic species damage** due to recovery of ADCPs, particularly if grapple method is required.	Benthic habitats and species.
	Disturbance, harm or injury as a result of vessel operations	Marine mammals, Birds

6.2.1.2. Sediment disturbance, mobilisation, compaction and benthic species damage due to deployment and recovery of ADCPs in benthic habitats.

Sediment mobilisation has the potential to lead to adverse effects on a range of benthic habitats and species. The extent to which sediments will mobilise is dependent on the nature of the sediment (coarse

sediments settle out rapidly following disturbance), the exposure of the site (sediments in exposed sites will frequently be subject to natural disturbance due to wave action), the tidal regime of the area (tide swept sediments are generally devoid of "fines"). The impact of sediment mobilisation on benthic habitats and their constituent species is dependent on the sensitivity of those species to burial and smothering resulting from sediment mobilisation and transport. The species found in exposed sediments are generally robust specialists capable of withstanding disturbance and smothering. The impacts of physical disturbance on the species associated with highly exposed coarse sediments are generally low and greatest in areas of low natural disturbance where the species present are less well adapted to withstand physical stress.

The benthic sediment habitat in the area at, and adjacent to, all of the deployment sites is comprised of shallow sandy-mud or mud sometimes in mosaic with areas of gravelly mud as a result of the tidal scour effect in the subtidal channels. No rare or unusual species have been recorded at or adjacent to any of the deployment sites and the constituent macroinvertebrate species at these locations are robust and easily capable of recovering from any temporary disturbance resulting from deployment, *in-situ* operation or recovery of the ADCPs in a short period of time (weeks). Even if grappling was required to recover one or more ADCPs, no significant impacts are possible due to the lack of sensitive receptor species or habitats Any mobilised sediment would eventually settle out within a small radius (<100m) and there are no records of any species sensitive to smothering effects in the area.

As such any sediment mobilisation would be short lived (within a single tidal cycle) and temporary it would not have the potential to lead to any significant impact on receiving environment. Similarly epibenthic species damage is not possible due to the lack of any such species in the area.

6.2.1.3 Disturbance, harm or injury as a result of underwater noise related to construction vessels and operation of ADCPs

The effects of underwater noise on marine mammals can lead to disturbance, harm or injury depending on the type and frequency of the noise and distance of the receptor.

Marine mammals

Marine mammal sensory systems are adapted to life in the water or, in the case of seals, both in water and on land. Marine mammals rely on sound to navigate, to communicate with one another and to sense and interpret their surroundings. Behavioural responses of marine mammals to a sound are known to be strongly influenced by the context of the event and individual factors such as the animal's experience, motivation, conditioning and activity (Southall *et al*, 2007). Such features and variability may also require consideration in the case-specific assessment of impact on marine mammals from introduced sound sources (NPWS 2014). Sound waves dissipate through the water with distance from the source. While local oceanographic conditions affect the path of the sound and its transmission.

Vessels produce what is referred to as non-pulse (non-impulsive) sounds with acoustic characteristics represented by single or multiple discrete sound events within 24 hrs with a continuous sound event without a rapid pulse rise time.

Depending on the exposure levels from underwater noise, auditory injury to marine mammals can occur. This may result in temporary loss in hearing sensitivity, known as Temporary Threshold Shift (TTS) or more permanent damage, known as Permanent Threshold Shift (PTS). The potential for auditory injury is related to the noise frequency relative to the hearing bandwidth of the marine mammal, and is also influenced by the duration of exposure. The level of impact on an individual is a function of the Sound Exposure Level (SEL) that an individual receives as a result of underwater noise.

Table 6.3 details the various functional groups relative to hearing for the majority of marine mammals encountered in Irish waters.

Table 6.3 Marine mammal functional groups relative to hearing at different sound frequencies.

Cetaceans			**Pinnipeds in water** 75 Hz–75 kHz	**Pinnipeds in air** 75 Hz-30 kHz
Low frequency 7 Hz-22 kHz	**Mid-frequency** 150 Hz-160 kHz	**High frequency** 200 Hz–180 kHz		
Baleen whales	Most toothed whales, dolphins	Certain toothed whales, porpoise	All species	All species
Species- Ireland Humpback whale Blue whale Fin whale Sei whale Minke whale	**Species– Ireland** Sperm whale Killer whale Long-finned pilot whale Beaked whale species Dolphin species	**Species– Ireland** Pygmy sperm whale Harbour porpoise	**Species– Ireland** Grey seal Harbour seal	**Species– Ireland** Grey seal Harbour seal

From: NPWS (2014). Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters.

Southall (2007) describes the sound pressure levels associated with the various functional groups as detailed in table 6.4.

Table 6.4 Sound pressure levels associated with Temporary Threshold Shift (TTS) and Permanent Threshold Shift (PTS)

Functional group	**Injury Criteria (based on single pulse)**	
	TTS	**PTS**
Low frequency cetaceans	224dB re: 1µPa (peak	230dB re: 1µPa (peak
Mid frequency cetaceans	224dB re: 1µPa (peak)	230dB re: 1µPa (peak)
High frequency cetaceans	224dB re: 1µPa (peak)	230dB re: 1µPa (peak
Pinnipeds (in water)	212dB re: 1µPa (peak)	218 dB re: 1µPa (peak

The proposed ADCPs will be operating in the range of 600 Khz or 1 Mhz and as such are outside of the recorded auditory range of marine mammals. Therefore no potential for impact is predicted on any marine mammal.

6.2.1.3 Disturbance, harm or injury as a result of disturbance related to construction vessels on wintering waterfowl and marine mammals

The intertidal areas of Cork Harbour provide important foraging areas for wintering waterfowl and waders. However, all of the ADCPs deployments are outside of such areas and in water depths of no less

than 5 meters. Cork Harbour and its environs, where the proposed ADCPs are to be deployed, is an extremely busy marine area in terms of large and small vessel traffic. As such birds will be habituated to vessel traffic and the operations of the deployment vessel would be insignificant in the context of general boat traffic within the area. The use of the area by marine mammals is extremely limited. Even if marine mammals were to be present in the area at the time of deployment, disturbance would be very short lived and insignificant relative to the high level of vessel movement with Cork Harbour and its environs.

Table 6.5 provides an impact prediction summary relative to the site-specific conservation objectives of Great Island Channel SAC and Cork Harbour SPA.

Table 6.5 Summary of impact prediction

Great Island Channel SAC (00105)		
Habitat	**Screening assessment**	
Mudflats and sandflats not covered by seawater at low tide [1140]	No Impact predicted. Habitat outside of the ZOI of the proposed project. Sediment disturbance would be too short lived and limited in scale to have the potential to lead settling out impacts on intertidal areas.	
Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	No Impact predicted. Coastal habitat outside of the ZOI of the proposed project. All saltmarsh habitats are confined to Great Island Channel. The nearest location of any ADCP to saltmarsh habitat is over 1.5km distant.	
Cork Harbour SPA (004030)		
Conservation objective: To maintain the favourable conservation condition of Little Grebe, Great Crested Grebe, Cormorant, 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, in Cork Harbour SPA which is defined by the following list of attributes and targets:		
Attributes	**Target**	**Screening assessment**
Population trend	Long term population trend stable or increasing	No Impact predicted.
Distribution	No significant decrease in the range, timing or intensity of use of areas by any of the SCI species (listed above), other than that occurring from natural patterns of variation	No Impact predicted. All deployments are in the subtidal outside of the intertidal foraging area for wintering wildfowl. Wintering waterfowl will be habituated to vessel traffic and the operations of the deployment vessel would be insignificant in the context of general boat traffic within the area.
Conservation objectives: To maintain the favourable conservation condition of Common Tern in Cork Harbour SPA which is defined by the following list of attributes and targets:		
Breeding population abundance: apparently occupied nests (AONs)	No significant decline	No potential for impact. Nesting sites outside of the ZOI of the proposed project.
Productivity rate: fledged young per breeding pair	No significant decline	No potential for impact. Proposed project does not have the potential to lead to impacts on adults that could result in impacts to fledging success.
Distribution: breeding colonies	No significant decline	No potential for impact. Breeding colonies outside of the ZOI of the proposed project.
Prey biomass available	No significant decline	No Impact predicted. Temporary ADCP deployments do not have the potential to impact prey biomass.
Barriers to connectivity	No significant decline	No Impact predicted. Temporary subtidal ADCP deployments do not have the potential to create barriers to connectivity.
Disturbance at the breeding site	Human activities should occur at levels that do not adversely affect the breeding common tern population	No Impact predicted. The Martello Tower at Marino Point and the Ringaskiddy deep water basin mooring dolphins now comprise the only known sub-colony breeding sites for this species within Cork Harbour and environs (RPS, 2014).

Conservation objectives: To maintain the favourable conservation condition of the wetland habitat in Cork Harbour SPA as a resource for the regularly-occurring migratory waterbirds that utilise it. This is defined by the following attribute and target:		
Habitat area	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	No potential for impact. Intertidal areas are outside of the ZOI of the proposed project. Temporary ADCP deployment only.

6.2.2 Cumulative Impacts

While a single development may not in itself cause a significant impact on the conservation objectives of a site, a combination of projects within a localised area may cause a negative impact on a site. Therefore, the cumulative impacts of a project or plan in association with other projects and plans must be taken into consideration when assessing the possible impacts of a development.

Cork Harbour and environs is an extremely busy water body. Shipping and recreational leisure craft are a constant feature within the site and the immediately adjacent hinterland is heavily utilised by industry. It would serve no purpose to list the multiple activities, projects and plans currently operational or planned for the area. However, a search of Cork County Council online planning portal and the Foreshore unit applications website did not indicate any source-path linkages between the project site and any additional projects in the area of Cork Harbour and its environs that could lead to a potential for cumulative impacts.

7. Screening statement

Following a review of the proposed project a screening assessment, following the guidelines of *Assessment of plans and projects significantly affecting Natura 2000 sites* - Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC has been conducted.

This Screening assessment has found that the proposed project would not be likely to have a significant effect individually, or in-combination with other plans and projects, on the Natura 2000 network. Accordingly, it is concluded that an Appropriate Assessment of the proposed development is not therefore required.

8. References

Assessment of plans and projects significantly affecting Natura 2000 sites; Methodological Guidance on the provisions of Articles 6(3) and (4) of the Habits Directive 92/43/EEC. European Commission, 2002.

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Appendix 1 Intertidal sediment

Intertidal Sediment data (Marine Institute/NPWS 2011). Folk 1954 Classification.

Easting (ITM)	Northing (ITM)	Location	Folk (1954) Classification
587764	572909	Ballynacorra River	Gravelly mud
587835	572886	Ballynacorra River	Mud
587824	572842	Ballynacorra River	Gravelly mud
587816	572920	Ballynacorra River	Slightly gravelly mud
588512	571879	Ballynacorra River	Slightly gravelly mud
587688	571696	Ballynacorra River	Slightly gravelly mud
587346	570668	Ballynacorra River	Mud
586933	569925	Ballynacorra River	Mud
584976	570344	Great Island Channel	Mud
575841	570945	Lough Mahon	Mud
585355	570490	Great Island Channel	Mud
584698	570154	Great Island Channel	Mud
583536	569665	Great Island Channel	Mud
586490	570238	Great Island Channel	Muddy gravel
581733	570493	Great Island Channel	Mud
583782	570188	Great Island Channel	Mud
580777	570173	Great Island Channel	Mud
580288	570820	Great Island Channel	Mud
585953	569757	Great Island Channel	Mud
584220	569659	Great Island Channel	Mud
581208	570390	Great Island Channel	Mud
577011	573220	North of Little Island	Muddy gravel
578041	572711	North of Little Island	Slightly sandy mud
578509	571963	Foaty Island channel	Mud
576879	570316	Lough Mahon	Mud
577743	570961	Foaty Island channel	Mud
577750	571487	Foaty Island channel	Mud
578595	572201	Foaty Island channel	Mud
578137	572110	Foaty Island channel	Mud
577809	571853	Foaty Island channel	Mud
574780	569730	Lough Mahon	Mud
573040	571939	Lough Mahon	Mud
571019	570249	Tramore River Channel, Lough Mahon	Slightly gravelly mud
573983	570065	Lough Mahon	Mud
575435	569885	Lough Mahon	Sandy Mud
576606	565185	Cork Harbour	Sandy mud
575994	565119	Cork Harbour	Mud
579077	563515	Cork Harbour	Slightly gravelly sand
578542	562502	Cork Harbour	Sandy gravel
578239	563067	Cork Harbour	Sandy gravel
575294	562731	Owenboy River, Cork Harbour	Mud

574269	562249	Owenboy River, Cork Harbour	Gravelly mud
575904	562212	Owenboy River, Cork Harbour	Mud
576612	561687	Owenboy River, Cork Harbour	Mud
576338	561832	Owenboy River, Cork Harbour	Mud
576164	562228	Owenboy River, Cork Harbour	Mud
578355	561569	Owenboy River, Cork Harbour	Mud
582837	563820	Cork Harbour	Mud
578689	561725	Owenboy River, Cork Harbour	Muddy gravel
583243	564081	Cork Harbour	Sandy Mud
583267	564297	Cork Harbour	Sandy mud
586640	566014	Cork Harbour	Sand mud
586999	570319	Great Island Channel	Mud
586287	565841	Cork Harbour	Slightly gravelly sandy mud
572784	572837	Glashaboy River channel, Lough Mahon	Sandy mud
572716	573004	Glashaboy River channel, Lough Mahon	Slightly gravelly sandy mud
572354	573908	Glashaboy River channel, Lough Mahon	Mud
573951	571659	Lough Mahon	Mud
573074	572231	Lough Mahon	Sandy mud
571193	570087	Tramore River, Lough Mahon	Slightly gravelly sandy mud
573476	570544	Lough Mahon	Sandy mud
585793	565877	Cork Harbour	Sandy mud
587859	572937	Ballynacorra River	Gravel
577459	571526	Foaty Island Channel	Gravel
575518	569738	Lough Mahon	Mud
571170	570103	Tramore River, Lough Mahon	Mud
574275	562469	Owenboy River, Cork Harbour	N/A
579399	561764	Cork Harbour	N/A
583086	564122	Cork Harbour	N/A
584743	565614	Cork Harbour	N/A
576770	573098	North of little Island	N/A
575444	565253	Monkstown Creek, Cork Harbour	Slightly gravelly mud
576699	565696	Monkstown Creek, Cork Harbour	Mud
578258	563290	Cork Harbour	Mud
578674	563265	Cork Harbour	Mud
581123	571121	Great Island Channel	Mud
580764	571499	Great Island Channel	Mud
588099	567687	Cork Harbour	Mud
587982	567561	Cork Harbour	Mud
587010	567349	Cork Harbour	Mud
586857	566016	Cork Harbour	Slightly gravelly sandy mud
579030	563500	Cork Harbour	Course shelly Sand
577898	561587	Owenboy River, Cork Harbour	Sandy mud

Appendix 2 Subtidal sediment

Subtidal Sediment Folk 1954 Classification.

INFOMAR data (2008)		
Coordinates (ITM)	**Location**	**Folk (1954) Classification**
581,497.239 564,503.589	Main navigation channel. Cork Harbour	Muddy sand
581,450.533 564,377.902	Main navigation channel. Cork Harbour	Gravelly mud
581,396.552 563,341.476	Main navigation channel. Cork Harbour	Sandy mud
581,180.630 562,909.632	Main navigation channel. Cork Harbour	Gravelly sand
582,130.687 559,287.541	833m south-southwest of Roches Point	Gravelly mud
581,574.688 559,017.639	132m southwest of Roches Point	Sandy mud
581,558.494 558,753.134	156m southwest of Roches Point	Muddy sand
576,766.695 569,469.524	West passage	Gravelly sand
577,036.728 569,227.915	West passage	Gravelly sand
NPWS Marine monitoring data (2016)		
576,319.825 570,062.425	Lough Mahon	Mud
577,782.025 570,969.179	Great Island Channel	Mud
587,416.124 570,750.816	Great Island Channel	Mud
587,114.560 570,121.465	Great Island Channel	Mud
585,595.173 568,392.755	Ballynacorra River	Gravely mud
WFD monitoring data (2021)		
573038, 572130	Lough Mahon	Sandy Mud
573318, 571673	Lough Mahon	Sandy Mud
573714, 571265	Lough Mahon	Sandy Mud
574174, 570921	Lough Mahon	Sandy Mud
574700, 570625	Lough Mahon	Sandy Mud
575460, 570320	Lough Mahon	Sandy Mud
57626, 570290	Lough Mahon	Sandy Mud
576844, 576844	Lough Mahon	Gravelly muddy sand
576534, 569610	Lough Mahon	Sandy Mud
577493, 570838	Lough Mahon	Sandy Mud
575782, 569906	Lough Mahon	Sandy Mud
577215, 568562	Lough Mahon	Sandy Mud
577455, 567351	Lough Mahon	Muddy sand
577440, 566648	Lough Mahon	Sandy Mud
577141, 565501	Lough Mahon	Sandy Mud
585397, 568348	Great Island Channel	Gravelly sandy mud
585922, 569749	Great Island Channel	Gravelly sandy mud
586451, 569897	Great Island Channel	Sandy mud
587023, 569944	Great Island Channel	Sandy mud
587122, 570380	Great Island Channel	Sandy mud
586801, 569984	Great Island Channel	Sandy mud
583120, 569977	Great Island Channel	Sandy mud
581794, 570179	Great Island Channel	Gravelly sandy mud
582620, 569761	Great Island Channel	Sandy mud

583652, 570032	Great Island Channel	Sandy mud
584229, 570047	Great Island Channel	Gravelly sandy mud
581879, 569815	Great Island Channel	Sandy mud
585357, 569968	Great Island Channel	Gravelly sandy mud
584632, 569935	Great Island Channel	Gravelly sandy mud
585569, 569912	Great Island Channel	Sandy mud