



**Proposed Installation of Meteorological Stations,
Deployment of Tide and Flow Gauges, Bed-mounted Current
Meters and Utilisation of Drones and a Remotely Controlled
Boat (ARCBoat) in Newport Bay and Clew Bay, Co. Mayo**

**Supporting Information for Screening for Appropriate
Assessment**

Produced by

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On behalf of

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January 2026

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1. Introduction

1.1. Background

This report has been prepared by AQUAFAC – APEM Group to provide the relevant information to the competent authority to inform the Screening for Appropriate Assessment (AA) for a Maritime Usage Licence. The MUL is being submitted for the proposed installation of meteorological station and deployment of tide and flow gauges and utilisation of drones and a remotely controlled boat (ARCBoat) at Newport Bay and Clew Bay, Co. Mayo (the 'Project'). The objective of the Project is to obtain environmental, hydrodynamic and water- quality data within Newport Bay and Clew Bay areas to inform detailed modelling of the hydrographic conditions of the area to ultimately inform the outfall discharge location for a proposed new Wastewater Treatment Plant (WWTP) to serve the Newport agglomeration in County Mayo. The locations of the meteorological (weather) station installations, anchored current meter deployments, tide and flow gauge deployments are shown in **Figure 1-1**. The aerial and hydro drone survey extent for Light Detection and Ranging (LiDAR), Multi Beam Echo Sounder (MBES), and dye tracing surveys will occur within the red line boundary shown in **Figure 1-2**. The locations of survey sites for water quality data are shown in **Figure 1-3** and **Figure 1-4**.

A vessel based MBES survey may be undertaken to complement the LiDAR dataset for areas of the seabed that are not prone to drying during low water on a spring tide. The MBES survey will be vessel-based and undertaken over a short, discrete period, involving temporary vessel movements within the survey area. Regarding the collection of samples for water quality analysis, additional *Escherichia coli* and *Intestinal enterococci* sampling will occur upstream of the tidal limit of the Newport River. Depending on accessibility either an automatic sampler will be deployed to collect water samples or manual sampling may occur. In addition to deploying a drone for dye tracing, a hydro-drone will be deployed with a mounted GPS system to monitor the concentration of the dye plume in-situ, as well as its development and variation over time. Temperature and salinity sensors will be integrated into bed-mounted current meters (Acoustic Doppler Current Profilers; ADCPs), which will be deployed on static seabed frames for the duration of the monitoring period.

Survey duration and sequencing

The marine surveys are not seasonally constrained, as spring and neap tides occur bi-monthly. Current meters (ADCPs), tide gauges and CTDs (conductivity, temperature, depth profilers) will be deployed at fixed locations for a minimum of 35 days (up to approximately 12 weeks depending on weather) to ensure capture of representative tidal cycles and variability. Fixed river flow gauges will be installed from dry land

for 12 months and removed thereafter. Spot gauging and river cross-section profiling will occur at the time of installation.

The LiDAR survey will be conducted as a single, one-off acquisition campaign to obtain high-resolution coastal topography and intertidal bathymetry and is expected to require 5-7 days in suitable weather conditions. Similarly, any MBES survey undertaken will be a single, discrete 5-7-day survey.

The programme for collecting meteorological, tidal, river-level and water-quality data will occur over a 12-month period, while the MUL is sought for five years to allow flexibility for deployment in favourable conditions. All survey equipment will be fully decommissioned and removed at the end of the survey period. No permanent loss or removal of habitat will occur as part of the works.

The aims of the Project can be summarised as follows:

The proposed marine surveys are required as part of data collection to provide quantitative inputs for a hydrodynamic model which is required to profile Clew, Newport and Westport Bay to aid the selection of a new discharge outfall for a proposed wastewater treatment plant for the settlement of Newport. The principal objective of the marine surveys is to help ensure robust assessments can be completed for the design of a new wastewater treatment plant which provides treated discharges in compliance with the Urban Waste Water Treatment Directive and with the conditions set in the extant Wastewater Discharge Authorisation licence. The benefits resulting from the completion of the Project would include:

- In-depth understanding of hydrographic conditions and water quality within Newport Bay and Clew Bay
- Validate pre-existing datasets, and provide the necessary dataset to conduct detailed modelling and highlight data gaps to be addressed to aid the development of WWTP

The works proposed include:

- Installation of 2no. weather stations to aid validation of data
- Installation of 6no. tidal gauges
- Installation of 5no. static, seabed-mounted current meters (ADCPs) with vertical profiles and integrated conductivity, temperature and depth (CTD) sensor.
- Installation of 4no. river flow and stage gauges
- Deployment of a drone to conduct a Light Detection and Ranging (LiDAR) survey to establish bathymetry of site. (one off, 5- 7 days)
- Deployment of Multi Beam Echo Sounder (MBES) to complement the LiDAR dataset (one off, 5-7 days)

- Deployment of an ARCBot to aid water sample collection
- Deployment of drone and hydro-drone to conduct dye and microbial tracing survey to understand dispersion pattern of effluent and to aid conceptual model calibration and verification processes under different conditions
- Water quality sampling within the bay and rivers
- Maintenance of the tidal and flow gauges, weather stations at site
- Decommissioning/removal of all surveying equipment at the end of the survey period

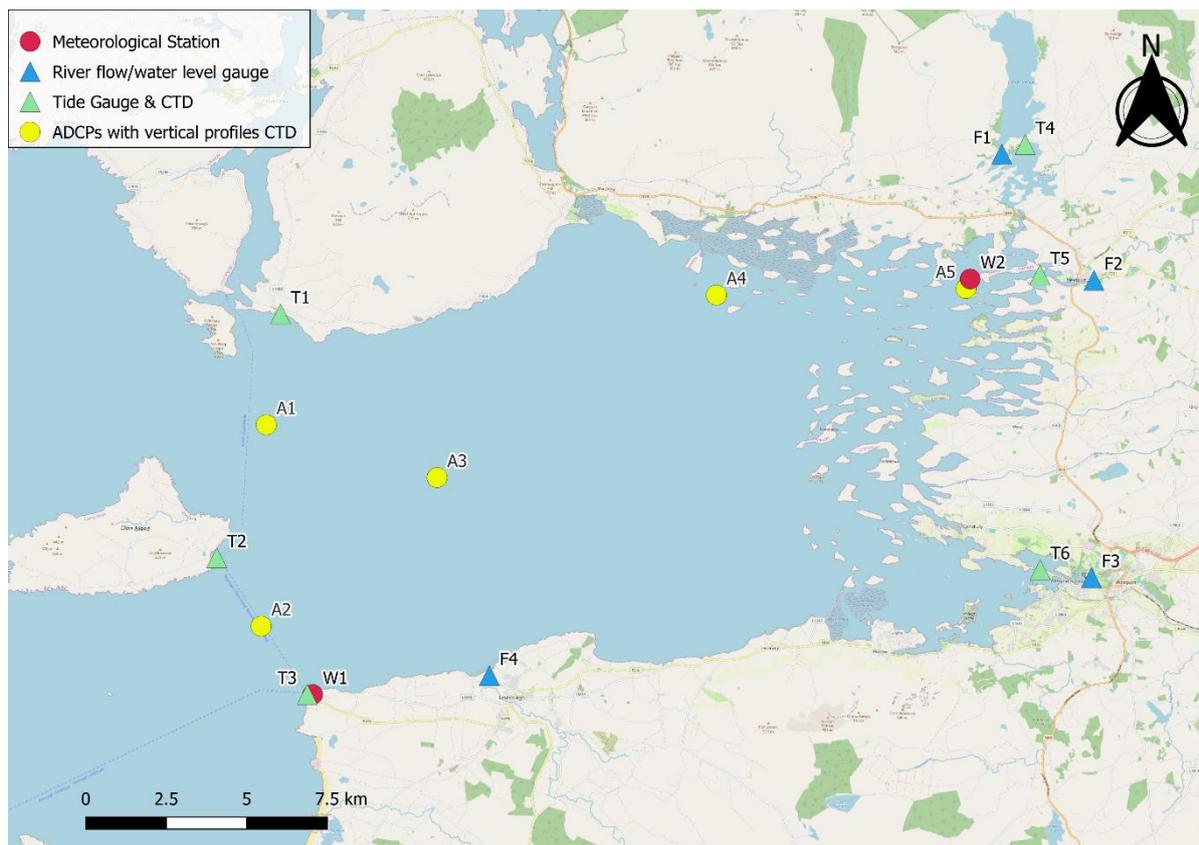


Figure 1-1: Proposed Instrument Locations in the Clew Bay and Newport Bay area.

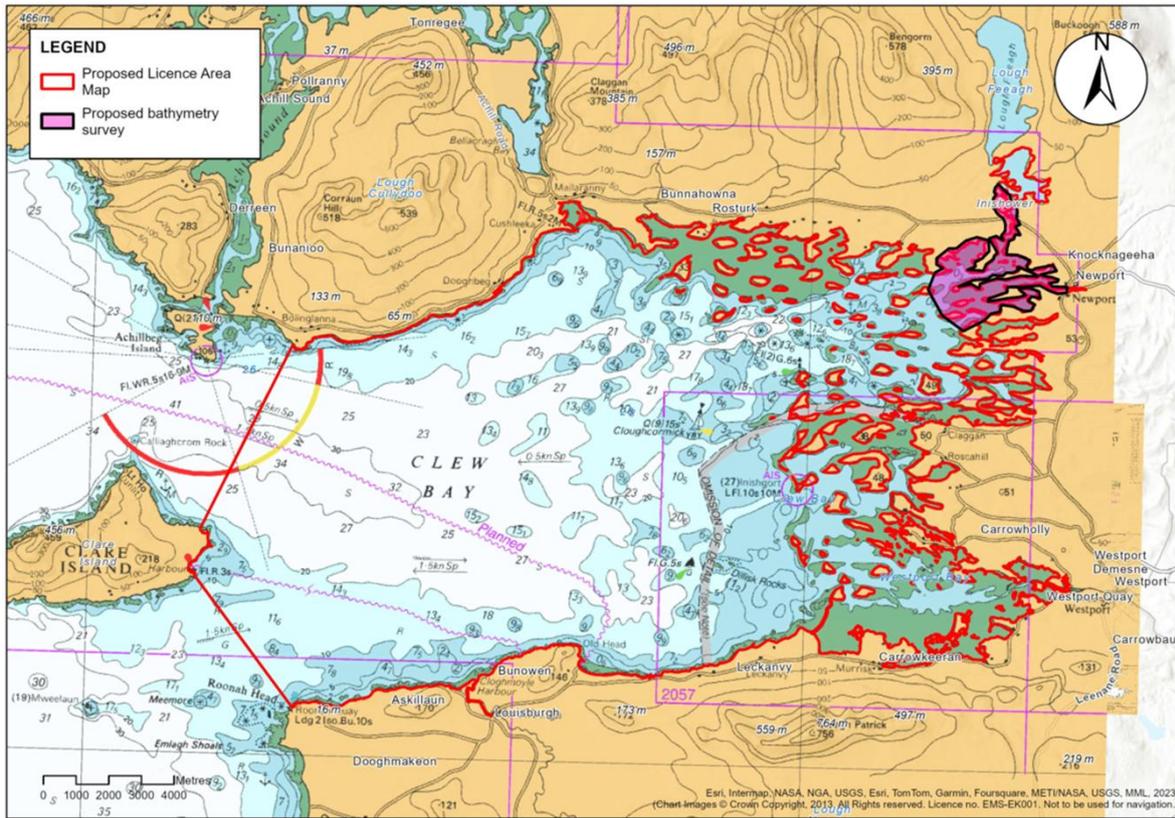


Figure 1-2: Proposed extent for bathymetric and water quality surveys in Clew Bay.

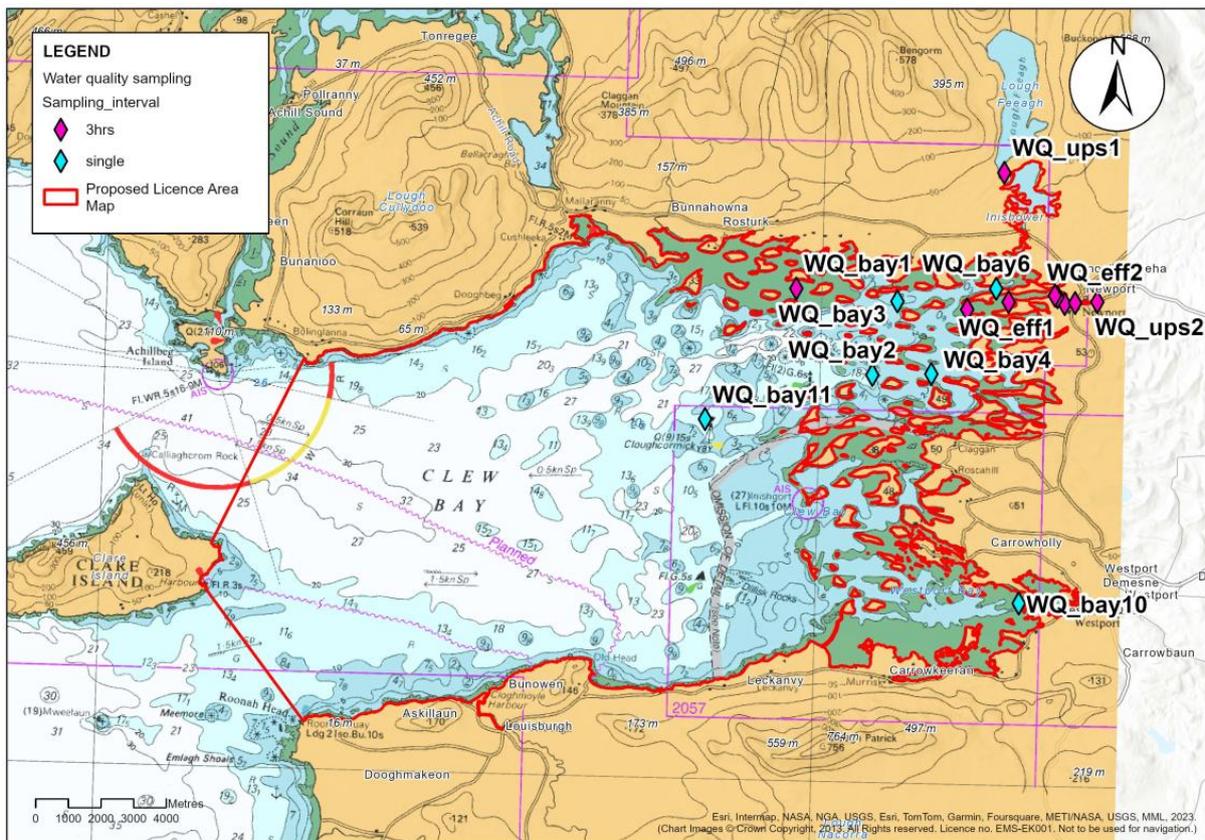


Figure 1-3: Proposed sampling locations for water quality surveys in Clew Bay.

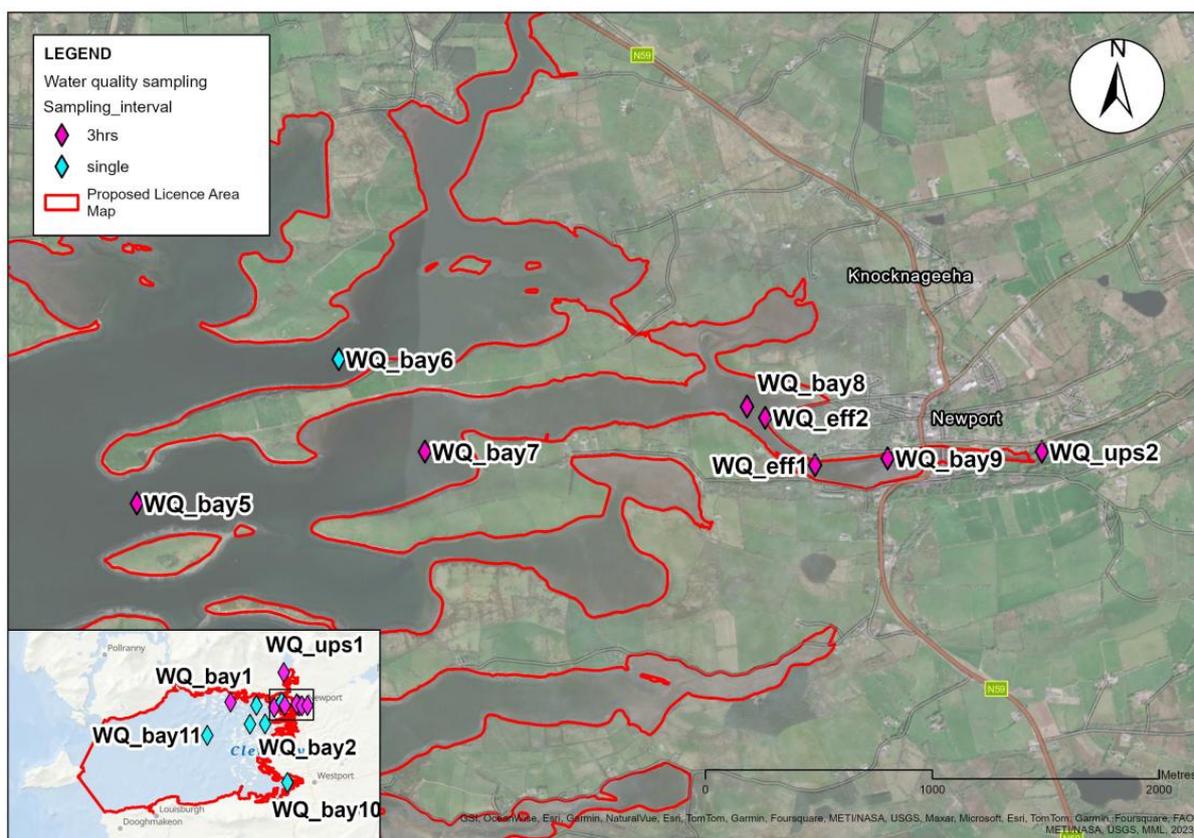


Figure 1-4: Close up of proposed sampling locations for water quality surveys in inner bay Clew Bay.

1.2. Purpose of this report

This report has been prepared to address the requirements of Article 6(3) of Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive), as transposed into Irish law by the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended). The report presents both the Screening for Appropriate Assessment (Stage 1) and the Natura Impact Statement (Stage 2) for the proposed Project.

1.3. Guidance

This report has been prepared in accordance with the following guidance:

- EC (2018) Managing Natura 2000 sites. The provisions of Article 6 of the Habitats Directive 92/43/EEC Commission Notice (2018)
- OPR (2021). Practice Note PN01 Appropriate Assessment Screening for Development Management
- DEHLG (2009) Appropriate Assessment of Plans and Projects in Ireland Guidance for Planning Authorities (Revised 2010)
- EC (2001) Managing Natura 2000 Sites: The provisions of Article 6 of the Habitats Directive

92/43/EEC

- Department of Arts, Heritage and the Gaeltacht – National Parks and Wildlife Service DAHG - NPWS (2012) Marine Natura Impact Statements in Ireland Special Areas of Conservation, A Working Document

This assessment includes a desk-based review of available records of protected QIs and SCIs including the following sources:

- Conservation Status Assessment Reports, Backing Documents and Maps prepared to inform national reporting¹ required under Article 17 of the Habitats Directive
- Site Synopsis, Conservation Objective Reports and Natura 2000 Forms available from NPWS
- Published and unpublished NPWS reports on protected habitats and species including Irish Wildlife Manual reports, Species Action Plans, and Conservation Management Plans
- Existing relevant mapping and databases *e.g.* waterbody status, species and habitat distribution *etc.* (sourced from the Environmental Protection Agency - <http://gis.epa.ie/>, the National Biodiversity Data Centre - <http://maps.biodiversityireland.ie> and the NPWS - <http://www.npws.ie/mapsanddata/>)

1.4. Structure of this Report

The remainder of this report is structured as follows:

- **Section 2. Legislation**
- **Section 3. Assessment Methodology**
- **Section 4. Receiving Environment**
- **Section 5. Potential Environmental Impacts**
- **Section 6. Screening For Appropriate Assessment**
- **Section 7. Stage 2: Natura Impact Statement**
- **Section 8. References**

¹ The most recent Article 17 report (2019) is available at <https://www.npws.ie/publications/article-17-reports/article-17-reports-2019>

1.5. Statement of Authority

Dr. James Forde has prepared the Appropriate Assessment report. He has a Ph.D. in Marine Ecology and is a full member of the CIEEM. James has over fifteen years' experience in marine research and environmental consultancy. James specialises in marine ecology and has a full appreciation of the objectives and mechanisms of national and international environmental legislation and policy. James' academic research has focused on benthic habitats and communities, and techniques used to assess ecological impacts under European environmental legislation including the Habitats Directive and the Water Framework Directive. As part of James' consultancy work, he has delivered assessment reports to meet the provisions of the Habitats Directive and EIA Directive to accompany planning applications for a wide range of developments including pier enhancement projects, coastal defence projects, and aquaculture.

Updates to the report were carried out by Neve McCann. Neve is a Senior Marine Consultant with AQUAFAC, holding an MSc in Applied Marine Conservation and a BSc in Zoology. She has experience across marine, freshwater and terrestrial ecology, environmental assessment, and regulatory compliance, gained through roles in consultancy and the public sector. She has authored Natura Impact Statements, Appropriate Assessment Screenings, Ecological Impact Assessments, and EIAR Biodiversity chapters for major infrastructure projects. She is technically skilled in data management and spatial analysis, proficient in ArcGIS, R Studio, and SQL, with experience in MSFD Descriptor assessments, ICES data calls, and contributions to MSFD Article 8 reporting. Neve has actively participated in ICES Working Groups and European marine forums, supporting collaborative research and policy development.

The report has been reviewed by Aisling Hearty. Aisling is a Principal ecologist with over 6 years of experience in consultancy and marine ecology. She is a graduate of B.Sc Science from University of Galway (UG, formerly National University of Ireland, Galway) and a First-Class Honours M.Sc in Marine Biology from UCC (University College Cork) where she completed her thesis on habitat distribution modelling of odontocetes using bioacoustic analysis. She then went on to co-author a published paper on the findings of this thesis which supported the designation of the Southeastern Rockall Slope and Canyons as an Important Marine Mammal Area (IMMA). Aisling has a wide range of experience in the preparation and review of Appropriate Assessment Screening reports, Natura Impact Statements, Ecological Impact Assessments, Environmental Impact Assessment Reports and supporting documents for an IROPI designated project. Aisling's project history includes working on aquaculture licencing, renewable energy projects (solar farms and onshore and offshore wind) and water quality projects and she has extensive experience in project management including several MUL applications.

2. Legislation

2.1. *Legislative Background*

Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (commonly known as the Habitats Directive) is European Community legislation regarding nature conservation established to ensure biodiversity is conserved through the conservation of natural habitats and wild fauna and flora in Europe.

The Habitats Directive was originally transposed into Irish law by the *European Communities (Natural Habitats) Regulations, 1997* (S.I. No. 94 of 1997). The 1997 Regulations were subsequently revoked and replaced by the *European Communities (Birds and Natural Habitats) Regulations 2011*, as amended (herein referred to as the 2011 Birds and Natural Habitats Regulations).

Under Regulation 42 of the 2011 Birds and Natural Habitats Regulations all competent authorities are required to conduct a screening for Appropriate Assessment (AA) and, if necessary, an AA on any plan or project on the foreshore for which it receives an application for consent, or which the authority itself wishes to undertake or adopt. This obligation derives from Articles 6(3) and 6(4) of the Habitats Directive.

The AA provision of the Habitats Directive is transposed in Ireland by the Planning and Development Act 2000 (as amended) in respect of land use plans and proposed developments requiring development consent. The Planning and Development Act, 2000 (as amended) is the basis for the Irish planning code, setting out the detail of regional planning guidelines, development plans and local area plans as well as the basic framework of the development management and consent system.

A network of sites of conservation importance hosting habitats and species as needing to be either maintained at or restored to favourable conservation status have been identified by each Member State. These sites are known as European sites within the Natura 2000 network.

European sites in Ireland that form part of the Natura 2000 network of protected sites comprise Special Areas of Conservation (SAC) sites designated due to their significant ecological importance for habitats and species protected under Annex I and Annex II respectively of the Habitats Directive, and Special Protection Area (SPA) sites designated for the protection of populations and habitats of bird species protected under the EU Birds Directive (Council Directive 2009/409/EEC). The sites are formally designated by the relevant minister under a statutory instrument. Candidate SAC and candidate SPA

sites (*i.e.* cSAC or cSPA) have the same level of protection as fully designated sites under Irish Law². The specific named habitats and/or (non-bird) species for which an SAC or SPA are selected are called the 'Qualifying Interests' (QIs), of the site. The specific named bird species for which an SPA is selected are called the 'Special Conservation Interests' (SCIs) (OPR 2021).

Following the requirements of Article 6(3) of the Habitats Directive, under Regulation 42 of the 2011 Birds and Natural Habitats Regulations, if a plan or project is not connected with, or necessary for the management of a European site and is likely to have a significant effect on the QIs or SCIs for which a site is designated either individually or in combination with other plans or projects, an AA is required to assess whether a plan or project will have any adverse effect on the integrity of a European site(s) in view of the Conservation Objectives set for the designated QIs or SCIs.

2.2. Appropriate Assessment (AA) Process

The **first stage of the AA process is Screening**; where the risk of a significant effect to a conservation feature (*i.e.* QI or SCI) from an impact mechanism can be **excluded** on the basis of objective evidence, the designated feature and impact mechanism combination is **screened out** of further assessment. The assessments undertaken as part of the first stage of AA process are documented in a Screening Statement for AA.

Where the Screening for AA identifies that a significant effect to a conservation feature from an impact mechanism is likely to occur, the conservation feature and the impact mechanism combination is brought forward for a detailed consideration of the potential for adverse effects. This detailed assessment of the potential for adverse effects is the second stage of the AA process. The assessments undertaken as part of the **second stage of the AA process are documented in a Natura Impact Statement (NIS)**.

This report has been prepared to provide the relevant information to inform the assessments to be undertaken for the Screening Statement for AA for the Project and has been prepared to address Article 6(3) obligations under the Habitats Directive and to inform the AA determination of the competent authorities. Specifically, this report focuses on the potential effects of the proposed development to European sites.

² Candidate sites are those that have been submitted to the European Commission, but not yet formally adopted under Ministerial Statutory Instrument (S.I.). Legal protection, and therefore, the requirement for AA, arises from the date that the Minister gives notice of his/her intention to designate the site.

3. Assessment Methodology

3.1. Overview

A key factor in the consideration as to whether a QI or an SCI (collectively referred to herein as conservation features) is likely to be affected by a proposed project is the existence of connectivity (or interaction/or impact pathway) between the feature and the impact mechanisms associated with the Project. National guidance (DEHLG, 2009) outlines that screening for AA should be carried out for any European Site within the likely Zone of Impact (Zol) of a plan or project.

For projects, the guidance outlines that the Zol must be evaluated on a case-by-case basis with reference to the nature, size and location of the Project, the sensitivities of the ecological receptors and the potential for in-combination effects. **Section 6.2** considers the potential effects due to the proposed Project, while **Section 6.3.** considers potential in-combination effects with other plans and projects.

3.2. Methodology

This report has been prepared to assist authorities in addressing Article 6(3) obligations under the Habitats Directive and focuses on the potential effects of the Project to European sites.

In order to establish the Zol of the proposed Project, the assessment of connectivity between project impact mechanisms (or source) and a conservation feature (*i.e.* QIs and SCIs) considers the location of the Project relative to:

- habitats and non-mobile species
- species foraging distances and migration routes
- the proximity of the Project to foraging and breeding areas
- potential changes in species behaviour
- effects on prey species resulting in alteration in interactions and associated impacts

To inform the assessment, nationally available data on protected habitats and species was mapped using a Geographic Information System (GIS) and interrogated to identify for source-pathway-receptor connectivity. The source (potential project impact mechanisms), pathways (hydrological, physical or ecological connectivity) and receptors (conservation features) were identified using GIS software and through the examination of aerial photography and a review of ecological surveys undertaken in the area. Any conservation feature identified to have a viable source-pathway-receptor link to the proposed Project were then examined further to determine the potential for significant effects.

The assessment of project impact sources (or mechanisms) considers all relevant aspects of the proposed Project that have the potential to directly or indirectly effect conservation features.

The assessment of potential effects of the Project on conservation features of SACs and SPAs are presented in **Section 6.2** while the assessment of in-combination effects are outlined in **Section 6.3**.

3.3. Source-Pathway-Receptor and Impact Assessment

The assessment of impact mechanisms considers all relevant aspects of the Project that have potential direct or indirect and effects on conservation features. In order to establish the Zone of Influence (Zoi) of the Project, the assessment of likely significant effects will be based on the Source-Pathway-Receptor (S-P-R) Model (OPR, 2021):

- **Source** - Identification of the characteristics of the Project based on the nature, size, location and type of impacts.
- **Pathway** – Identification of pathways that could link European sites and their conservation features to the Project.
- **Receptor** – Identification of the location, nature and sensitivities of the conservation features and the ecological conditions supporting their survival and the conservation objectives specified to maintain or restore favourable conservation status.

To establish the Zone of Influence (Zoi) of the project, the assessment of connectivity between impact mechanisms (sources) and conservation features (i.e. the QIs of SACs and SCIs of SPAs) considers the location of the project relative to designated habitats and non-mobile species, species' foraging ranges and migration routes, proximity to foraging and breeding areas, potential behavioural responses to disturbance, hydrological connectivity with conservation features, and indirect effects on prey species that could alter ecological interactions.

To inform the screening exercise, available data on protected habitats and species were mapped and interrogated in a Geographic Information System (GIS) to identify potential Source–Pathway–Receptor (S–P– R) connections. Sources (impact mechanisms), pathways (hydrological, physical or ecological connectivity), and receptors (conservation features) were identified with reference to ecological surveys undertaken in the area. Where no ecological pathway or functional link exists between the project and the conservation features of a European site, there is no potential for likely significant effects, and those features can be screened out.

3.4. Potential Impact Mechanisms

The potential impact mechanisms from this survey are outlined in detail in **Section 5**.

They include:

- Underwater noise disturbance.
- Visual and above-water disturbance.

4. Receiving Environment

4.1. Marine Benthic Area

Data available (INFOMAR, 2024³) indicates that water depths at the deployment in the outer area of the bay ranges from 5–30m in depth, with the inner reaches of the bay, particularly around the drumlin islands, being particularly shallow with relatively greater depths located in the waters due east and west of Clare Island. A review of Conservation Objectives for Clew Bay Complex SAC (NPWS, 2011), indicates that the substrate underlying the deployment locations are comprised primarily of sands and muds at the proposed moorings at A1, A2, A3, A4 and A5. A review of benthic subtidal communities by NPWS, 2011, indicates that the moorings A4 and A5 overlap a muddy substrate dominated with polychaete and bivalve communities.

*The inner part of Clew Bay contains the Clew Bay Oyster Fishery Order (1979), which establishes a statutory flat oyster (*Ostrea edulis*) oyster fishery. As highlighted by Bord Iascaigh Mhara (BIM), this is a nationally significant natural oyster resource. The proposed survey activities do not overlap with any oyster trestles, navigation poles, or aquaculture structures. All survey navigation routes and deployment locations have been planned to avoid these features, in accordance with BIM recommendations.*

4.2. Marine Aerial Environment

The proposed aerial range for the LiDAR survey covers a small spatial extent adjoining the mouth of the Newport River and covering nearshore areas of Newport. For the dye tracing survey, the aerial range extends throughout the Clew Bay area. The aerial range for both surveys overlap with Clew Bay Complex SAC, which supports a good diversity of wintering waterfowl. Deployment of a drone will be required to conduct these surveys.

³ <https://www.infomar.ie/index.php/maps/interactive-maps/seabed-and-sediment> (Accessed 30/04/2024)

4.3. Coastal Habitat

The coastal boundary of Clew Bay Complex SAC is comprised of a number of Annex I coastal habitats, namely 'Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)', 'Embryonic shifting dunes', 'Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes)' and 'Machairs (* in Ireland)'. The proposed installation of one weather station W2 is located within Clew Bay Complex SAC, while W1 is located just outside the West Connacht Coast SAC.

The tide gauges (code: T1-T6) will be attached to substrate along the coastline to be submerged in water for recording tidal data. The proposed sites for T4, T5 and T6 overlaps with Clew Bay Complex SAC, T2 and T3 will overlap with West Connacht Coast SAC. Tide gauge T1 does not overlap with an SAC or SPA.

4.4. Marine Mammal Habitat

Important Otter and Common (Harbour) Seal populations are found in Clew Bay. The proposed deployment of an ARCoat, MBES and hydro-drone would occur throughout the area of Clew Bay. Similarly, the proposed dye dispersion survey will be conducted throughout the area where high numbers of Annex II marine mammals have been recorded.

4.5. Natura 2000 Sites in the Zone of Influence (Zoi)

The Zone of Influence (Zoi) for the proposed surveys has been defined as the maximum spatial extent over which the Project could plausibly give rise to direct or indirect effects on European sites, taking account of the nature of the activities, the relevant impact pathways, and the ecological characteristics of potential receptors. These factors informed a precautionary delineation of the Zoi, ensuring that all relevant Natura 2000 sites and receptors with a reasonable likelihood of interaction were included in the screening and subsequent impact assessment.

The Zoi is not defined by a single distance buffer. Instead, it has been established using a source–pathway–receptor approach, informed by:

- the potential spatial extent of underwater noise disturbance
- the potential for visual and above water disturbance; and
- species-specific ecology, including mobility, habitat use, and dependence on fixed locations (e.g. breeding sites or haul-out areas).

Table 4.1 and **Table 4.2** show the conservation features for which the European sites are designated, their conservation objectives and the distance of the SACs and SPAs to the Project. All site synopsis and

conservation objectives for the European sites can be accessed through the NPWS website. A map of all SACs and SPAs within the ZOI of the project can be seen below in (**Figure 4-1** and **Figure 4-2**)

4.5.1. Special Protection Areas (SPA)

The Source Pathway Receptor (SPR) model identified the European sites within the ZOI of the proposed Project which were considered in this screening for AA. There are 2 SPA sites within the ZOI of the Project (see **Figure 4-1**); the sites are:

- Owenduff/Nephin Complex SPA (Site code: 004098) (4.9km north of Project)
- Clare Island SPA (Site code: 004136) (2 km west of Project)

The conservation features (*i.e.* SCIs) of the above SPAs are listed in **Table 4.1** alongside conservation objectives set for the conservation features. A brief description of the SPAs is provided below.

Clare Island SPA (Site code: 004136)

Clare Island lies at the entrance to Clew Bay, Co. Mayo and some 5 km from the mainland. The site comprises all the cliffs on the island, a length of approximately 10 km, as well as the land adjacent to the cliff edge (inland for 300 m) and the adjacent marine waters (to distances of 200 m or 500 m, depending on auk distribution). The site is designated for the following species: Fulmar (*Fulmarus glacialis*) [A009], Shag (*Phalacrocorax aristotelis*) [A018], Common Gull (*Larus canus*) [A182], Kittiwake (*Rissa tridactyla*) [A188], Guillemot (*Uria aalge*) [A199], Razorbill (*Alca torda*) [A200] and Chough (*Pyrrhocorax pyrrhocorax*) [A346]. The conservation objectives for this site's SCIs can be found in **Table 4.1**.

Owenduff/Nephin Complex SPA (Site code: 004212)

This large area of relatively intact blanket bog and mountains incorporates the catchment of the Owenduff River and much of the Nephin Beg Mountain range in Co. Mayo. Lough Feeagh, which is located approximately 5 km north-northwest of Newport, lies at the south-east corner of the site. From here, the site extends northwards to the Owenmore River and almost to the town of Bangor Erris and westwards to the townland of Ballycroy. The site is designated for the following species: Merlin (*Falco columbarius*) [A098] and Golden Plover (*Pluvialis apricaria*) [A140]. Conservation objectives for this site's SCIs can be found in **Table 4.1**.

Table 4.1: Special Protection Areas and Special Conservation Interests

European site and site code	Distance from proposed MUL area (km)	Qualifying Interest	Ecological Group	Conservation Objective	Foraging Behaviour
Clare Island SPA (Site code: 004136)	Located ca. 2 km West of MUL boundary.	Fulmar (<i>Fulmarus glacialis</i>) [A009]	Annex I bird species	To maintain or restore favourable conservation condition	Largely breeding on sea cliffs but will also nest on level ground including on buildings. Winters at sea with sporadic visits to colonies.
		Shag (<i>Phalacrocorax aristotelis</i>) [A018]	Annex I bird species	To maintain or restore favourable conservation condition	Colonial nester, breeding on all Irish coasts where suitable cliffs exist. Preys on small fish taken from just below the water's surface.
		Common Gull (<i>Larus canus</i>) [A182]	Annex I bird species	To maintain or restore favourable conservation condition	Breeds on inland and coastal areas of the west of Ireland where it predate on terrestrial and aquatic insects, invertebrates and fish.
		Kittiwake (<i>Rissa tridactyla</i>) [A188]	Annex I bird species	To maintain or restore favourable conservation condition	A summer visitor where it can be found on steep coastal cliffs on all Irish coasts. Preys on fish including waste from commercial fishing and invertebrates.

		Guillemot (<i>Uria aalge</i>) [A199]	Annex I bird species	To maintain or restore favourable conservation condition	A highly marine species only found on land in the breeding season (May–August). Surface dives for small fish and some invertebrates.
		Razorbill (<i>Alca torda</i>) [A200]	Annex I bird species	To maintain or restore favourable conservation condition	A resident auk species, highly marine though inland during the breeding season (March–August). Surfaces dives for mainly fish, sometimes invertebrates.
		Chough (<i>Pyrrhocorax pyrrhocorax</i>) [A346]	Annex I bird species	To maintain or restore favourable conservation condition	A resident of rocky coasts in the north, west and south where it feeds on insects, worms, berries, small mammals; a relatively indiscriminate feeder.
Owenduff/ Nephin Complex SPA** (Site code: 004098)	Located 4.9 km North of Proposed MUL Area	Merlin (<i>Falco columbarius</i>) [A098]	Annex I bird species	To maintain or restore favourable conservation condition	A rare breeding bird in Ireland, it rests on moorlands and bogs and can be found primarily in the west but are more distributed in the winter than the breeding season. Prey includes Skylark and Meadow Pipits.

		Golden Plover (<i>Pluvialis apricaria</i>) [A140]	Annex I bird species	To maintain or restore favourable conservation condition	A summer visitor from central and southwest Europe and winter visitor from Iceland. Breeds on moors, bogs and grasslands where they feed on invertebrates, beetles and earthworms but also berries and seeds.
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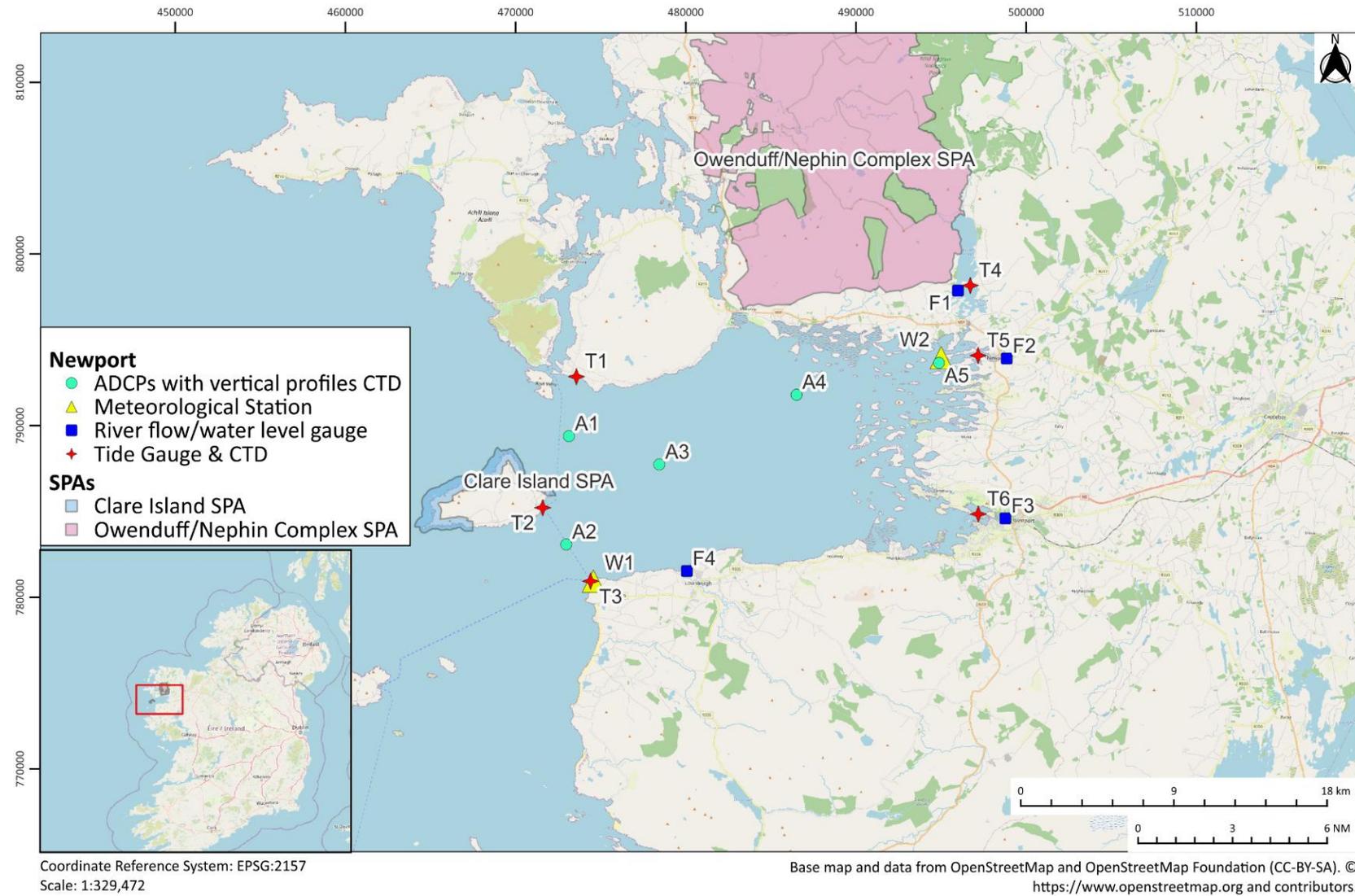


Figure 4-1: SPAs within the Zol of the Project.

4.5.2. Special Areas of Conservation (SAC)

The SPR model identified the European sites within the ZOI of the proposed Project which were considered in this screening for AA. There are 7 SAC sites within the ZOI of the Project (see **Figure 4-2**); these sites are:

- Clew Bay Complex SAC (Site code: 001482)
- West Connacht Coast SAC (Site code: 002998)
- Corraun Plateau SAC (Site code: 000485)
- Oldhead Wood SAC (Site code: 002144)
- Owenduff/Nephin Complex SAC (Site code 000532)
- Newport River SAC (Site code: 002144)
- Clare Island Cliffs SAC (Site code: 002243)

The conservation features (*i.e.* QIs) of the above SACs are listed in **Table 4.2** alongside conservation objectives set for the conservation features. Brief description of the SACs is provided below.

Clare Island Cliffs SAC (Site code: 002243)

Clare Island lies at the entrance to Clew Bay, Co. Mayo approximately 5 km from the mainland. Much of the low-lying ground is covered by boulder clay and glacial drift. The site comprises the coastal fringe of the island extending from Kinnacorra in the east moving westwards along the north coast and around the southwestern corner of the island as far east as Bunnamohaun. The site extends inland in the western area of the site; on the northwest flanks of Knockmore Mountain. The site is an SAC selected for the following habitats listed on Annex I of the E.U. Habitats Directive: Vegetated Sea cliffs of the Atlantic and Baltic coasts [1230], Calcareous rocky slopes with chasmophytic vegetation [8210], Siliceous rocky slopes with chasmophytic vegetation [8220].

Clew Bay Complex SAC (Site code: 001482)

Clew Bay is a wide, west-facing bay on the west coast of Co. Mayo. It is open to the westerly swells and winds from the Atlantic, with Clare Island giving only a small amount of protection. The geomorphology of the bay has resulted in a complex series of interlocking bays creating a wide variety of marine and terrestrial habitats. The site is an SAC selected for the following habitats and/or species listed on Annex I/II of the E.U. Habitats Directive: Mudflats and sandflats not covered by seawater at low tide [1140], Coastal lagoons [1150], Large shallow inlets and bays [1160], Annual vegetation of drift lines [1210], Perennial vegetation of stony banks [1220], Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330], Embryonic shifting dunes [2110], Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120], Machairs (* in Ireland) [21A0], Old sessile oak woods with *Ilex* and *Blechnum* in

the British Isles [91A0], Geyer's Whorl Snail (*Vertigo geyeri*) [1013], Otter (*Lutra lutra*) [1355] and Harbour Seal (*Phoca vitulina*) [1365].

Corraun Plateau SAC (Site code: 000485)

The site is situated on the Corraun Peninsula to the south-east of Achill Island, Co. Mayo. The site is dominated by heath-type vegetation, in combination with pockets of peat and rock and a scattering of small lakes. As the site is bounded to the south by the sea, it displays an interesting range of habitats in a continuum from shore to mountain summit. The site is an SAC selected for the following Annex I habitats listed on the E.U. Habitats Directive: Northern Atlantic wet heaths with *Erica tetralix* [4010], European dry heaths [4030], Alpine and Boreal heaths [4060], *Juniperus communis* formations on heaths or calcareous grasslands [5130], Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*) [8110] and Siliceous rocky slopes with chasmophytic vegetation [8220].

Newport River SAC (Site code: 002144)

The Newport River is a relatively short, low-level river and flows to the sea at Newport from Beltra Lough. The site consists of the lough and Newport River as well as tributaries of the Skerdagh, Glenisland Crumpaun/Boghadoon and Bracklagh/Cloondaff. The Newport River flows through wet grassland and wet heath areas with a small section in the east of the site flowing through blanket bog with areas of the riverbank being wooded with deciduous trees and coniferous afforestation occurring close to the river in areas. The Newport River is a renowned salmonid river hosting Atlantic Salmon and is of particular interest due to the presence of a significant population of Freshwater Pearl Mussel. The site is an SAC for the following Annex II species of the E.U. Habitats Directive: Freshwater Pearl Mussel (*Margaritifera margaritifera*) [1029] and Salmon (*Salmo salar*) [1106].

Oldhead Wood SAC (Site code: 000532)

Oldhead Wood is situated on the sheltered eastern slopes of two low hills, 2 km north-east of Louisburgh on the southern shore of Clew Bay, Co. Mayo. The site contains old oak woodland and dry heath, and most of the woodland on the site was designated as a Nature Reserve in 1984. The site has been selected as an SAC for the following Annex I terrestrial habitats listed under the EU Habitats Directive: European dry heaths [4030] and Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0].

Owenduff/Nepin Complex SAC (Site code: 00534)

This large area of relatively intact blanket bog and mountains incorporates the catchment of the Owenduff River and much of the Nepin Beg Mountain range and is situated in Co. Mayo. Lough Feeagh, which is located approximately 5 km northwest of Newport Town, lies in the south-east corner

of the site. From here the site extends northwards to the Owenmore River and almost to the town of Bangor Erris and westwards to the townland of Ballycroy. The site is an SAC selected for the following habitats and/or species listed on Annex I/II of the E.U. Habitats Directive: Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110], Natural dystrophic lakes and ponds [3160], Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitriche-Batrachion* vegetation [3260], Northern Atlantic wet heaths with *Erica tetralix* [4010], Alpine and Boreal heaths [4060], *Juniperus communis* formations on heaths or calcareous grasslands [5130], Blanket bogs (* if active bog) [7130], Transition mires and quaking bogs [7140], Salmon (*Salmo salar*) [1106], Otter (*Lutra lutra*) [1355], Slender Green Feather-moss (*Drepanocladus vernicosus*) [1393] and Marsh Saxifrage (*Saxifraga hirculus*) [1528].

West Connacht Coast SAC (Site code: 002998)

This site consists of a substantial area of marine waters lying off the coasts of Counties Mayo and Galway in the west of Ireland. Comprising two parts, in its northern component the site extends from the coastal waters off Erris Head westwards beyond Eagle Island and the Mullet Peninsula in Co. Mayo. From there it extends southwards immediately off the coast as far as the entrance to Blacksod Bay. In its southern component, the site stretches from Clare Island and the outer reaches of Clew Bay at Old Head and continues southwards off the Mayo coast to the Connemara coast near Clifden and Ballyconneely, Co Galway. Predominantly coastal in nature, the site extends westwards into Atlantic continental shelf waters up to approximately 7-11 km from the mainland, although in its southern component it remains mostly inshore of the main islands: Clare Island, Inishturk, Inishbofin and Inishshark. The site has been selected as an SAC for the Annex II marine mammal species listed under the EU Habitats Directive: Common Bottlenose Dolphin (*Tursiops truncatus*) [1349] and Harbour porpoise (*Phocoena phocena*) [1351].

Table 4.2: Special Areas of Conservation and Qualifying Interests.

European site and site code	Distance from proposed MUL area (km)	Qualifying Interest	Conservation Objective
Clare Island Cliffs SAC (Site Code: 002243)	Located ca. 2 km west of MUL boundary	Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]	To maintain favourable conservation condition
		Calcareous rocky slopes with chasmophytic vegetation [8210]	To maintain favourable conservation condition
		Siliceous rocky slopes with chasmophytic vegetation [8220]	To maintain favourable conservation condition
Clew Bay Complex SAC (Site code: 001482)	Located within MUL Boundary	Annual vegetation of drift lines [1210]	To maintain favourable conservation condition
		Perennial vegetation of stony banks [1220]	To maintain favourable conservation condition
		Atlantic salt meadows (<i>Glauco-Puccinellietalia maritima</i>) [1330]	To restore favourable conservation condition
		Embryonic shifting dunes [2110]	To restore favourable conservation condition
		Marram Dunes (white dunes) [2120]	Not defined therefore generic objectives apply; to restore or maintain conservation condition
		Machairs (* in Ireland) [21A0]	Not defined therefore generic objectives apply; to restore or maintain conservation condition

European site and site code	Distance from proposed MUL area (km)	Qualifying Interest	Conservation Objective
		Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0]	Not defined therefore generic objectives apply; to restore or maintain conservation condition
		Geyer's Whorl Snail (<i>Vertigo geyeri</i>) [1013]	Not defined therefore generic objectives apply; to restore or maintain conservation condition
		Coastal lagoons [1150]	To maintain favourable conservation condition
		Mudflats and sandflats not covered by seawater at low tide [1140]	To maintain favourable conservation condition
		Large shallow inlets and bays [1160]	To maintain favourable conservation condition
		Harbour seal (<i>Phoca vitulina</i>) [1365]	To maintain favourable conservation condition
		Otter (<i>Lutra lutra</i>) [1355]	To restore favourable conservation condition
Corraun Plateau SAC (Site code: 000485)	Located ca. >1 km north of proposed MUL boundary	Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010]	To restore favourable conservation condition
		European dry heaths [4030]	To restore favourable conservation condition
		Alpine and Boreal heaths [4060]	To restore favourable conservation condition

European site and site code	Distance from proposed MUL area (km)	Qualifying Interest	Conservation Objective
		<i>Juniperus communis</i> formations on heaths or calcareous grasslands [5130]	To restore favourable conservation condition
		Siliceous scree of the montane to snow levels (<i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladani</i>)	To restore favourable conservation condition
Newport River SAC (Site code: 002144)	Located ca. > 1 km east of proposed MUL boundary	Freshwater Pearl Mussel (<i>Margaritifera margaritifera</i>) [1029]	To restore favourable conservation condition
		Salmon (<i>Salmo salar</i>) [1106]	To maintain favourable conservation condition
Oldhead Wood SAC (Site code: 000532)	Located > 1km south of proposed MUL boundary	European dry heaths [4030]	To restore favourable conservation condition
		Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0]	To restore favourable conservation condition
Owenduff/ Nephin Complex SAC (Site Code: 000534)	Located ca. 1 km north of proposed MUL boundary	Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>) [3110]	To maintain favourable conservation condition
		Natural dystrophic lakes and ponds [3160]	To maintain favourable conservation condition
		Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Calliticho-Batrachion</i> vegetation [3260]	To maintain favourable conservation condition
		Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010]	To restore favourable conservation condition

European site and site code	Distance from proposed MUL area (km)	Qualifying Interest	Conservation Objective
		Alpine and Boreal heaths [4060]	To restore favourable conservation condition
		<i>Juniperus communis</i> formations on heaths or calcareous grasslands [5130]	To maintain favourable conservation condition
		Blanket bogs (* if active bog) [7130]	To restore favourable conservation condition
		Transition mires and quaking bogs [7140]	To restore favourable conservation condition
		Salmon (<i>Salmo salar</i>) [1106]	To restore favourable conservation condition
		Otter (<i>Lutra lutra</i>) [1355]	To maintain favourable conservation condition
		Marsh Saxifrage (<i>Saxifraga hirculus</i>) [1528]	To maintain favourable conservation condition
		Slender Green Feathermoss (<i>Hamatocaulis vernicosus</i>) [6216]	To maintain favourable conservation condition
West Connacht Coast SAC (Site code: 002998)	Located within MUL boundary	Common Bottlenose Dolphin (<i>Tursiops truncatus</i>) [1349]	To maintain favourable conservation condition
		Harbour porpoise (<i>Phocoena phocena</i>) [1351]	To maintain favourable conservation condition

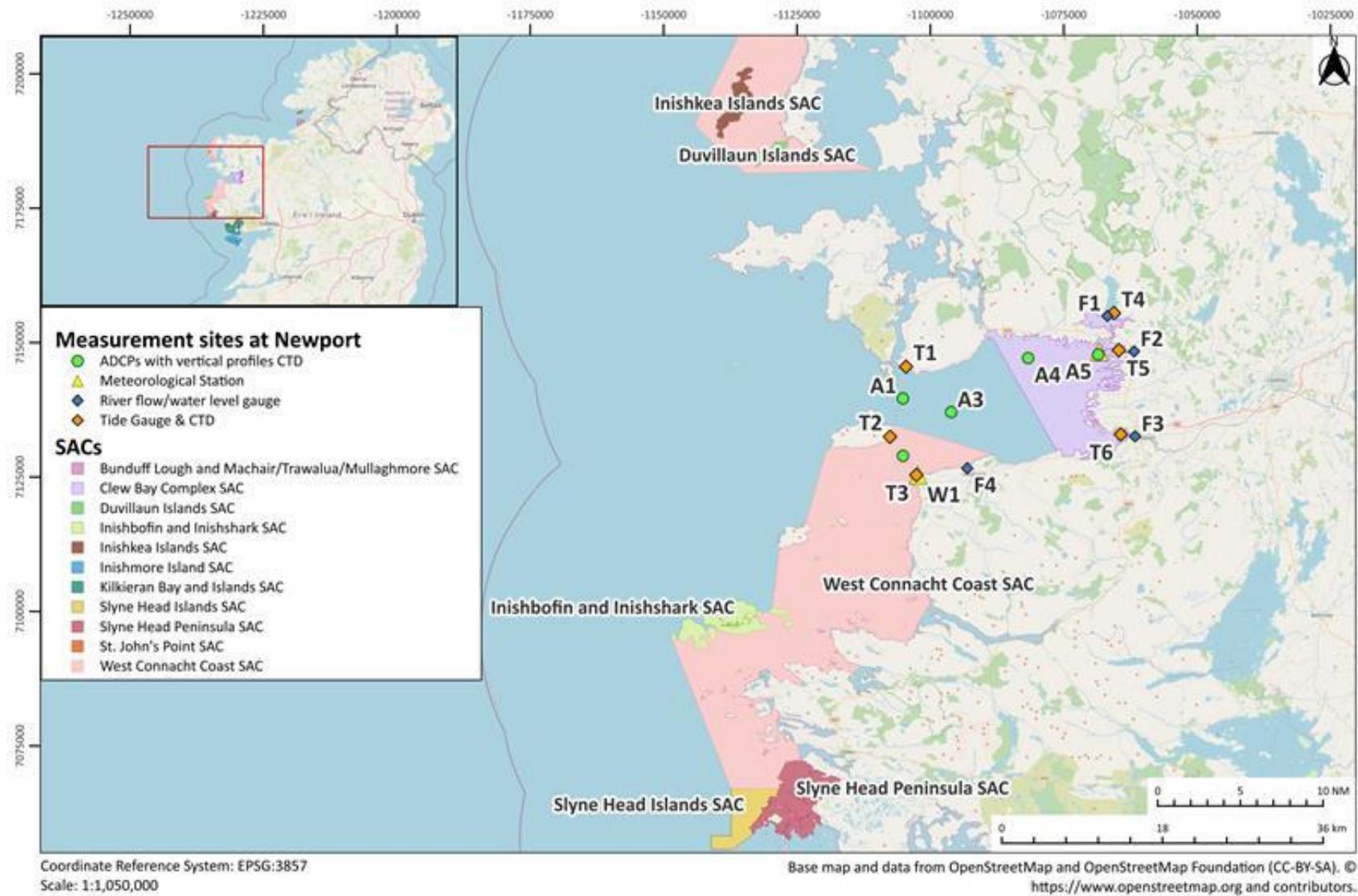


Figure 4-2 SACs within the ZOI of the Project.

4.5.3. Far Ranging Qualifying interests (QIs) Annex II (Marine Mammals)

This section considers Annex II marine mammal species listed as Qualifying Interests (QIs) due to their wide-ranging foraging behaviour and potential ecological connectivity with the Project area. In accordance with national guidance and the precautionary principle, SACs designated for these species were considered beyond the immediate Zone of Influence (ZoI) where a credible source - pathway-receptor linkage could not be excluded at the Screening for Appropriate Assessment stage.

There are two SACs in the immediate vicinity of the Project area within which marine mammal species occur:

- West Connacht Coast SAC (Site code: 002998) – Bottlenose Dolphin (*Tursiops truncatus*) [1349] & Harbour porpoise (*Phocoena phocena*) [1351]
- Clew Bay Complex SAC (Site code: 001482) – Harbour seal (*Phoca vitulina*) [1365]

The following species listed as QIs in SACs in Ireland have been assessed in terms of their potential to occur in the Project area:

- ***Phoca vitulina* (Harbour seal):** The furthest foraging trip for harbour seal reported by Sharples *et al.* (2012) was 220 km. A total of 10 SACs in Irish waters designated for harbour seal are located within 220 km of the Project; these SACs are assessed in the Screening assessment.
- ***Halichoerus grypus* (Grey seal):** Cronin *et al.* (2011) investigated grey seal movement on Ireland's continental shelf. A total of 529 foraging trips were recorded with the furthest trip measuring 511 km; given this wide range all SACs designated for the species are included in the Screening assessment.

The following cetacean species were also considered:

- ***Phocoena phocena* (Harbour porpoise):** The SACs in Irish waters designated for the wide-ranging species are included in the Screening for AA.
- ***Tursiops truncatus* (Common Bottlenose Dolphin):** The SACs in Irish waters designated for the species are included in the Screening for AA.

The relevant SACs designated for Annex II marine mammal species are detailed in **Table 4.3**.

Table 4.3: SACs designated for marine mammal species found in Irish waters.

Special Area of Conservation (SAC)	Qualifying Interest				
	Grey Seal (<i>Halichoerus grypus</i>) [1364]	Harbour Seal (<i>Phoca vitulina</i>) [1365]	Common bottlenose dolphin (<i>Tursiops truncatus</i>) [1349]	Harbour Porpoise (<i>Phocoena phocoena</i>) [1351]	Distance from Site
Ballysadare Bay SAC [000622]		✓*			173 km
Belgica Mound Province SAC [002327]			✓*	✓*	341 km
Blackwater Bank SAC [002953]				✓*	610 km
Basket Islands SAC [002172]	✓*			✓*	224 km
Bunduff Lough and Machair/Trawalua/Mullaghmore SAC [000625]				✓*	194 km
Carnsore Point SAC [002269]				✓*	584 km
Clew Bay Complex SAC [001482]		✓*			7 km
Codling Fault Zone SAC [003015]				✓*	617 km
Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC [000627]		✓*			170 km
Donegal Bay (Murvagh) SAC [000133]		✓*			206 km
Duvillaun Islands SAC [000495]	✓*		✓*		48 km
Galway Bay Complex SAC [000268]		✓*			147 km

Special Area of Conservation (SAC)	Qualifying Interest				
	Grey Seal (<i>Halichoerus grypus</i>) [1364]	Harbour Seal (<i>Phoca vitulina</i>) [1365]	Common bottlenose dolphin (<i>Tursiops truncatus</i>) [1349]	Harbour Porpoise (<i>Phocoena phocoena</i>) [1351]	Distance from Site
Glengarriff Harbour and Woodland SAC [000090]		✓			342 km
Gweedore Bay and Islands SAC [001141]				✓*	215 km
Hook Head SAC [000764]			✓*	✓*	544 km
Horn Head and Rinclevan SAC [000147]	✓*				257 km
Inishbofin and Inishshark SAC [000278]	✓*				42 km
Inishmore Island SAC [000213]				✓*	117 km
Kenmare River SAC [002158]		✓*		✓*	281 km
Kilkieran Bay and Islands SAC [002111]		✓*		✓*	97 km
Killala Bay/Moy Eastuary SAC [000458]		✓*			142 km
Lambay island SAC [000204]	✓	✓		✓*	613 km
Lough Swilly SAC [002287]				✓*	301 km
Lower River Shannon SAC [002165]			✓*		200 km
Porcupine Bank Canyon SAC [003001]			✓*		427 km
Roaringwater Bay and Islands SAC [000101]	✓*			✓*	341 km

Special Area of Conservation (SAC)	Qualifying Interest				
	Grey Seal (<i>Halichoerus grypus</i>) [1364]	Harbour Seal (<i>Phoca vitulina</i>) [1365]	Common bottlenose dolphin (<i>Tursiops truncatus</i>) [1349]	Harbour Porpoise (<i>Phocoena phocoena</i>) [1351]	Distance from Site
Rockabill to Dalkey Island SAC [003000]				✓*	620 km
Rutland Island and Sound SAC [002283]		✓*			199 km
Saltee Islands SAC [000707]	✓*				563 km
Slaney River Valley SAC [000781]		✓	✓*		623 km
Slieve Tooley/Tormore Island/Loughros Beg Bay SAC [000190]	✓*				184 km
Slyne Head Islands SAC [000328]	✓*		✓*		60 km
Slyne Head Peninsula SAC [002074]			✓*		63 km
South-West Porcupine Bank SAC [002329]			✓*		432 km
St. John's Point SAC [000191]			✓*		185 km
West Connacht Coast SAC [002998]			✓*	✓*	23 km
West of Ardara/Maas Road SAC [000197]		✓*			199 km

5. Potential Environmental Impacts

5.1. *Potential Impact Mechanisms*

The potential impact mechanisms considered for Appropriate Assessment have been identified following application of a source–pathway–receptor model and with reference to the nature, scale and duration of the proposed survey activities. On this basis, the assessment focuses on disturbance-related pathways relevant to mobile Annex II species.

Accordingly, the following potential impact mechanisms are considered further within this assessment:

- Underwater noise and disturbance is associated with vessel activity during the operation of multibeam echo-sounder (MBES) surveys.
- Localised, low-power acoustic emissions associated with static Acoustic Doppler Current Profiler (ADCP) deployments.
- Visual and above-water disturbance associated with vessel presence and intermittent use of aerial drones for survey purposes.

Other potential impact mechanisms, including physical disturbance to habitats, water quality or pollution risk, and effects on bird species, were considered at screening stage and are not considered further, as no relevant source–pathway–receptor linkage was identified and significant effects can be excluded on the basis of objective information

5.2. *Physical Disturbance to Habitats Directive Annex I Marine Benthic Communities*

Flow gauges 1, 3 & 4 are outside of the bounds of any SACs or sensitive habitats. Flow gauge F2 occurs in the Newport River SAC. The flow gauges will be mounted from dry land and removed thereafter. As a result, there will be no riverbed disturbance or impact on the habitat of the QIs in the scope of works. Due to the current meters being bed-mounted there is a localised and temporary risk of disturbance to the benthic habitats under the footprint of the deployment locations. Though most current meter deployments occur outside SACs, the deployment of two meters (A4 & A5) occurs within the Clew Bay Complex SAC area (see **Figure 1-1**). The proposed mooring at A4 and A5 coincides with the following marine habitat:

- Large shallow inlets and bays [1160]

This habitat supports a variety of benthic communities and the deployment of the current meter at A4 and A5 coincides with the following subtidal benthic community:

- Sandy mud with polychaetes and bivalve community complex

5.3. Physical Disturbance to Habitats Directive Annex I Coastal Habitats

Weather Stations & Tide Gauges

Due to the weather stations being installed on land near the coastline there is a risk of disturbance to Annex I coastal habitats. The tide gauges present a similar risk as they will be positioned in the water along the coastline. Weather station W2 and tide gauges T4, T5 and T6 are located within Clew Bay SAC which incorporates three Annex I habitats (see **Figure 1-1**). The proposed weather station and tide gauge are located near the following coastal habitats:

- Atlantic salt meadows (*Glauco-Puccinellietalia maritima*) [1330]
- Embryonic shifting dunes [2110]
- Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120]
- Machairs (* in Ireland) [21A0]

5.4. Physical Disturbance to Habitats Directive Annex II Species and birds

Tide Gauges

Due to the tide gauges being installed in the sea there is a risk of disturbance to Annex II marine mammal species. Tide gauges T2 and T3 are located within West Connacht Coast SAC (see **Figure 1-1**), which is designated for Common Bottlenose Dolphin (*Tursiops truncatus*) [1349] and Harbour porpoise (*Phocoena phocena*) [1351]. There is three tide gauges T4, T5 and T6 located within Clew Bay SAC. There is a risk of effects if the proposed installations overlap with marine mammal foraging areas, posing a collision risk.

Hydro-drone, deployment vessel, ARCBoat and vessels undertaking MBES surveys

Due to the movement of the hydro-drone, instrument deployment vessel, ARCBoat and MBES throughout Clew Bay Complex SAC these remotely operated devices have the potential to pose a collision risk for marine mammals as the equipment traverses the bay area.

Microbial dye tracing

Dye will be released from the baseline discharge locations and will be undertaken during the ebb of spring tides and neap tides on at least three occasions. Rhodamine B and Rhodamine WT are fluorescent dyes commonly used as tracers in hydrological investigations. Rhodamine B and

Rhodamine WT are considered toxic at certain levels and therefore have to be investigated further in this report. Dyes have the potential to negatively impact aquatic life.

Aerial drones

Aerial drones will be deployed intermittently for LiDAR and dye tracing surveys. While direct collision risk to marine mammals is negligible, drones generate above-water noise and visual stimuli (e.g., drone shadow, movement, and intermittent buzzing sounds). These cues may be detected by marine mammals (particularly seals at the surface) and otter in shoreline habitats, potentially causing short term behavioural responses such as localised avoidance.

5.5. Noise Disturbance to Habitats Directive Annex II Species

Marine mammals rely on sound to navigate, to communicate with one another and to sense and interpret their surroundings. As vessel-based MBES surveys will be undertaken within Clew Bay, there is a potential risk of noise disturbance to Annex II marine mammal species arising primarily from vessel activity. If the frequency of anthropogenic noise overlaps with the frequencies used by marine mammals, this may reduce the animal's ability to detect important sounds for navigation, communication and prey detection (Weilgart, 2007). This is termed acoustic masking, which may occur anywhere within an organism's auditory range (Wright *et al.* 2007; Richardson *et al.* 1995). Masking of important vocalisations will result in increasing information ambiguity and, in extreme circumstances, may result in cetaceans being unable to orientate themselves or hunt/evade predation in the marine environment (Wright *et al.* 2007).

Noise emissions associated with static ADCP deployments are highly localised, low power and short range and are not considered further in this assessment, in line with the Appropriate Assessment screening determination undertaken by the Maritime Area Regulatory Authority (MARA).

Southall *et al.* (2008) have categorised seals and cetaceans into five functional groups based on several laboratory studies, audiometric data and through comparisons of anatomy. The functional groups group cetaceans in relation to their known auditory ability and functional frequencies, whilst all pinniped species were assessed based on their auditory ability in air as well as their auditory ability in water. Otters (*Lutra lutra*) spend 75% of their lives on land. They can be relatively tolerant of disturbance and adjust to circumstances. They are often present in urban areas with considerable human activity nearby. There are no criteria to assess the significance of underwater noise on the Eurasian otter however it is thought they are similar to those of pinnipeds (Ghoul & Reichmuth, 2014)

and are assessed as such moving forward. Details of the frequency abilities of cetaceans and whales are included in the table below.

Table 5.1: Functional frequencies of various cetaceans and pinnipeds found in Irish waters (adapted from Southall *et al.* (2007)). Qualifying Interest species of Irish SACs highlighted in bold.

Cetaceans			Pinnipeds (in water)	Pinnipeds (in air)
Low Frequency (7 Hz-35 kHz)	Mid-frequency (150 Hz-160 kHz)	High Frequency (200 Hz-180 kHz)	All species (50 Hz-86 kHz)	All species (75 Hz – 30 kHz)
Baleen whales	Most toothed whales, dolphins	Certain toothed whales, porpoises	All species	All species
Species Recorded in Irish Waters				
Humpback whale	Sperm whale	Pygmy sperm whale	Grey seal	Grey seal
Blue whale	Killer whale		Harbour seal	Harbour seal
Fin whale	Long-finned pilot whale	Harbour porpoise		
Sei whale	Beaked whale species			
Minke whale	Dolphin species			

6. Screening for Appropriate Assessment

The obligation to undertake AA under the 2011 Birds and Natural Habitats Regulations derives from the Habitats Directive. Regulation 42(1) of the 2011 Regulations requires that:

*A screening for Appropriate Assessment of a plan or project for which an application for consent is received, or which a public authority wishes to undertake or adopt, and which **is not directly connected with or necessary to the management of the site as a European Site**, shall be carried out by the public authority to assess, in view of best scientific knowledge and in view of the conservation objectives of the site, if that plan or project, individually or in combination with other plans or projects is likely to have a significant effect on the European site.*

The proposed Project is not associated with the 'management' of European sites within the Natura 2000 Network having regard to Article 6 of the Habitats Directive, and as such it is appropriate that the proposed Project is subject to a screening for AA. This screening assessment investigates, in view of best scientific knowledge, whether the proposed Project, individually or in combination with other plans and projects, would be likely to have a significant effect on European sites.

As outlined in **Section 1**, this report, which has been prepared to assist competent authorities address Article 6(3) obligations of the Habitats Directive and associated national regulations, focuses on the potential effects to European sites associated with the proposed Project. A description of the Project is outlined in **Section 1.1**, while **Section 6.1** considers the likelihood of significant effects of the Project on European sites both in isolation and in combination with other projects.

6.1. Characteristics of European Site(s)

6.2. Assessment of Potential Significant Effects to QIs of SACs

Impact Mechanism 1 – Physical Disturbance

Marine benthic Communities

The deployment of current meters at site A4 and A5 in the inner reaches of Clew Bay overlap with the following marine habitat:

- Large shallow inlets and bays [1160]

This habitat supports the sensitive benthic community:

- Sandy mud with polychaetes and bivalves community complex.

Based on the interpolation provided by NPWS, the QI 'Large shallow inlets and bays' extends throughout much of the Clew Bay Complex SAC site and encompasses an area of 10,189 ha. The extent of the area dominated by 'Sandy mud with polychaetes and bivalve community complex' has been identified by NPWS at 5,971 ha. An individual ADCP meter may occupy, at most, an area of c. 2m²

The meters are to be deployed at fixed stations for the duration of the survey (minimum 35 days). The effect on the seabed will be temporary occupation of the seabed though as the area occupied by the meter does not represent a sensitive subtidal benthic community and **no effect is likely to occur** because of the equipment being deployed. Therefore, the physical impact mechanism is **screened out** for further assessment.

Coastal Habitat

Weather station W2 and tide gauges T4, T5 and T6 are located within Clew Bay Complex SAC which incorporates three Annex I habitats (see **Figure 1-1**). The proposed weather stations and tide gauges are located near to but do not necessarily overlap with these coastal habitats, the QIs of which are listed in **Table 4.2**. Considering the small spatial extent occupied by the proposed tidal gauges they pose no significant effect to the coastal habitat or QIs of the SACs within which they will be located.

The tidal gauges are to be deployed at fixed stations for the duration of the survey period. The effect to the coastline will be temporary occupation of a minimal area of the coastline, and as the areas occupied by the tidal gauges do not disrupt a sensitive habitat **no effect is likely to occur** as a result of the equipment being deployed. Therefore, the physical impact mechanism is **screened out** of further assessment.

The weather stations will be installed at fixed stations for the duration of the survey period. The effect to the coastal habitat will be temporary occupation, and as the area occupied by the weather station does not disrupt a sensitive community **no effect is likely to occur** as a result of the installation. Therefore, the physical impact mechanism is **screened out** of further assessment.

Marine Mammals

Tide Gauges

Tide gauges (code: T2 & T3) are located within West Connacht Coast SAC (see **Figure 1-1**). The QIs supported by this SAC is Common Bottlenose Dolphin (*Tursiops truncatus*) [1349] and Harbour porpoise (*Phocoena phocena*) [1351]. Considering the small spatial extent occupied by the proposed tidal gauges they pose no significant effect/no significant collision risk to the QIs.

The tidal gauges are to be deployed at fixed stations for the duration of the survey period. The effect to the habitat will be temporary occupation of a minimal area of the coastline, and as the area occupied by the tidal gauge does not disrupt a sensitive species **no effect is likely to occur** as a result of the equipment being deployed. Therefore, the physical impact mechanism is **screened out** of further assessment.

Hydro-drone, deployment vessel, ARCBoat, MBES (Physical disturbance)

The collision risks with the hydro-drone, instrument deployment vessel, ARCBoat and MBES individually pose is not significant due to their relatively small size, slow speed and infrequent deployment throughout the survey period.

The hydro-drone will be deployed on three separate occasions during the survey period. The ARCBoat (**Figure 1-1**) will be deployed on three separate occasions, each lasting c. one day during the survey period. The MBES (**Figure 1-1**) will be deployed during the survey period. It is of note that the MBES survey will cover a relatively small nearshore area (see bathymetric extent, **Figure 1-1**). Considering the highly mobile nature of marine mammals and large spatial extent of suitable habitat available, excluding the bathymetric survey extent, an overlap is unlikely. All three pieces of equipment will subsequently be recovered after each sample collection/survey is completed.

The effect to the bay area will be temporary navigation of surface waters, and as the areas occupied by the hydro-drone, ARCBot and MBES do not disrupt a sensitive community or habitat **no effect is likely to occur** because of the installation. Therefore, the **physical disturbance and collision risk pathway** is screened out of further assessment.

Microbial dye tracing

Dye will be released from the baseline discharge locations and will be undertaken during the ebb of spring tides and neap tides on at least three occasions. Rhodamine B and Rhodamine WT are fluorescent dyes commonly used as tracers in hydrological investigations. These dyes are frequently used due to their strong fluorescence even at low concentrations.

Rhodamine WT will be used in this study because of its low environmental impact. Field, 2005 studied the ecotoxicity of fluorescent dyes, including Rhodamine WT, and found low levels of concern for concentrations under 22mg/L, and Skjolding *et al.*, 2021 found no statistically significant effects were observed ($p < 0.05$) at tested concentrations (up to 91, 100 and 200 mg/L for algae, crustaceans and fish embryos, respectively). Earlier work by Parker, 1973 tested the toxicity of Rhodamine WT dye on the larval development of oysters and on juvenile salmon and trout; with concentrations up to 10mg/L over 48 hours for oysters and 375mg/L over 17.5 for fish, no mortalities or abnormalities were observed. The fish remained healthy in dye-free water when last checked a month after the test.

Dye tracing will be carried out with Rhodamine WT below the maximum allowable concentration quality standard set out in Skjolding *et al.*, 2021 of $>910 \mu\text{g/L}$. The effects of the microbial dye tracing are considered to **not be significant** and are therefore **screened out** for further assessment.

Impact Mechanism 2 – Noise Disturbance

Multibeam echo sounder (MBES)

Different models of multibeam echo sounders (MBES) are selected depending on the survey depth. As noted in **Section 4.1**, water depths within the Clew Bay Complex SAC range from approximately 5 - 30 m. MBES systems designed for shallow-water (0.2-50 m) applications typically operate at very high frequencies (c. 500 kHz⁴). Such frequencies lie well above the functional hearing range of marine mammals occurring in the area (highest functional frequency $\sim 150\text{--}180$ kHz for high-frequency cetaceans).

⁴ [kongsberg_application_note_discovering-the-redefined-em-series.pdf](#) (accessed: 12/05/2022)

Therefore, MBES signals are unlikely to be detected by marine mammals and are not expected to result in auditory injury. However, in accordance with the precautionary principle, a potential for localised behavioural disturbance remains due to vessel movements associated with MBES operation, near-field detectability of secondary noise sources (e.g., vessel engine noise), and the presence of Annex II species (harbour porpoise, bottlenose dolphin, grey seal, harbour seal) within Clew Bay.

For this reason, although MBES emissions are biologically insignificant in terms of direct auditory impact, the noise disturbance pathway **cannot be fully discounted** and is therefore **screened in for** further assessment for relevant Annex II species and SACs (**Table 6.2**). Noise disturbance effects on Annex I habitats are screened out (no relevant receptor pathway).

Current meters (Noise disturbance)

Acoustic Doppler Current Profilers (ADCPs) are static, seabed-mounted instruments that emit low-power, highly localised acoustic signals, typically operating within the 300–1200 kHz frequency range. This frequency range lies entirely above the known hearing thresholds of pinnipeds and odontocetes present in Irish waters; therefore, direct auditory detection of ADCP emissions is unlikely and no injury or masking effects are anticipated.

Deployment and recovery of ADCPs require brief and infrequent vessel access and handling activities, generating only short-term, localised noise comparable to routine background vessel activity in the receiving environment. Such effects are not considered to represent a meaningful source of disturbance. Accordingly, likely significant effects arising from ADCP deployment can be excluded at screening, and this pathway is not considered further.

Impact Mechanism 3- Visual / Above – water disturbance

Aerial Drones

Aerial drones will be operated on three separate occasions to support dye tracing surveys, and during low water on a spring tide for LiDAR surveys. Although the collision risk to birds listed as SCIs in **Table 4.1** is low due to the temporary nature of drone activity and adherence to operational controls, drones may introduce above - water noise and visual stimuli detectable by marine mammals and otter.

Marine mammals, particularly pinnipeds and cetaceans at the surface, as well as otter along the shoreline, may exhibit brief, localised behavioural responses such as alertness or minor avoidance when drones are overhead. These effects would be temporary, reversible, and highly localised; however, in line with the precautionary principle and NPWS (2014) guidance, a potential pathway for short-term disturbance cannot be entirely excluded. Therefore, visual and above - water disturbance from aerial drones is **screened in** for further assessment.

The screening outcomes above are reflected in **Table 6.1–Visual and** above-water disturbance pathways are spatially constrained and limited to the immediate vicinity of survey activity; therefore, only SACs within a precautionary screening distance of approximately 0-100 km from the Project area (reflecting the maximum ranges of Annex II species and site proximity) are considered for this impact mechanism.

Table 6.3 which summarise the screened-in and screened-out impact mechanisms for each European site.

Table 6.1: Impact Mechanism 1 – Physical disturbance.

Site	Qualifying Interest	Source-Pathway-Receptor Assessment
Corraun Plateau SAC (Site code: 000485)	Annex I habitat Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010] European dry heaths [4030] Alpine and Boreal heaths [4060] <i>Juniperus communis</i> formations on heaths or calcareous grasslands [5130] Siliceous scree of the montane to snow levels (<i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladani</i>) [8110]	The Project is considered non-invasive and predominantly marine and temporary in nature, with some presence in coastal and freshwater habitats. In relation to terrestrial habitats and species, there is no potential pathway for interaction between the impact mechanism and QI and are therefore excluded at the Screening for AA stage. Consequently, it can be concluded that there will be no significant effects from the impact mechanism to the QIs. There is no potential pathway for interaction between the impact mechanism and the QIs. The QIs and impact mechanism combinations are screened out.
Cross Lough (Killadoon) SAC (Site code: 00484)	Annex I habitat Perennial vegetation of stony banks [1220]	
Lough Cahasy, Lough Baun and Roonah Lough SAC (Site code: 001529)	Annex I habitat Coastal lagoons [1550] Perennial vegetation of stony banks [1220] Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120]	
Oldhead Wood SAC (Site code: 000532)	Annex I habitat European dry heaths [4030] Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0]	

Clare Island Cliffs SAC (Site code: 002243)	Annex I habitat	Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] Calcareous rocky slopes with chasmophytic vegetation [8210] Siliceous rocky slopes with chasmophytic vegetation [8220]	
Newport River SAC (Site code: 002144)	Annex II species	Freshwater Pearl Mussel (<i>Margaritifera margaritifera</i>) [1029] Salmon (<i>Salmo salar</i>) [1106]	<p>The flow gauge F2 occurs in Newport River SAC. The flow gauges will be mounted from dry land and removed thereafter. As a result, there will be no riverbed disturbance or impact on the habitat of the QIs in the scope of works.</p> <p>Consequently, it can be concluded that there will be no significant effects from the impact mechanism to the QIs. There is no potential pathway for interaction between the impact mechanism and the QIs.</p> <p>The QIs and impact mechanism combinations are screened out.</p>

Owenduff/Nephin Complex SAC (Site code: 000534)	Annex I habitat	<p>Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>) [3110]</p> <p>Natural dystrophic lakes and ponds [3160]</p> <p>Water courses of plain to montane levels with <i>Ranunculion fluitantis</i> and <i>Callichlo-Batrachion</i> vegetation [3260]</p> <p>Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010]</p> <p>Alpine and Boreal heaths [4060]</p> <p><i>Juniperus communis</i> formations on heaths or calcareous grasslands [5130]</p> <p>Blanket bogs (* if active) [7130]</p> <p>Transition mires and quaking bogs [7140]</p>	<p>The installation of flow gauge (F1) (see Figure 1-1) in the mouth of Lough Feeagh, Co. Mayo was assessed in relation to impacts to Annex I habitats and Annex II species.</p> <p>While the flow gauge will be in the proximity of Owenduff/Nephin Complex SAC due to the installation methods discussed in Section 1.1 not impacting the riverbed or habitat, they are not considered to cause significant disturbance to community or habitat. Furthermore, the presence of the survey equipment will be temporary and will be removed from the area upon the conclusion of the survey period.</p>
	Annex II species	<p>Salmon (<i>Salmo salar</i>) [1106]</p> <p>Otter (<i>Lutra lutra</i>) [1355]</p> <p>Marsh Saxifrage (<i>Saxifraga hirculus</i>) [1528]</p> <p>Slender Green Feathermoss (<i>Hamatocaulis vernicosus</i>) [6216]</p>	<p>Consequently, it can be concluded that there will be no significant effects from the impact mechanism to the QIs.</p> <p>It is possible to exclude the potential for significant effects at the Screening for AA stage.</p> <p>The QIs and impact mechanism combinations are screened out.</p>

<p>Clew Bay Complex SAC (Site code: 001482)</p>	<p>Annex I Habitat</p>	<p>Annual vegetation of drift lines [1210] Perennial vegetation of stony banks [1220] Atlantic salt meadows (<i>Glaucopuccinellietalia maritimae</i>) [1330] Embryonic shifting dunes [2110] Marram Dunes (white dunes) [2120] Machairs (* in Ireland) [21A0] Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0] Coastal lagoons [1150] Mudflats and sandflats not covered by seawater at low tide [1140] Large shallow inlets and bays [1160]</p>	<p>The deployment and installation of tidal gauges (T4, T5 and T6), weather station (W2), hydro-drone and MBES (see Figure 1-2), ARCBoat and microbial dye were assessed in relation to impacts to Annex I habitats, associated benthic marine communities and Annex II species.</p> <p>While the survey equipment was found to overlap with SACs and associated QIs, the overlap was minimal and is considered not to cause significant disturbance to community or habitat. Furthermore, the presence of the survey equipment will be temporary and will be removed from the area upon the conclusion of the survey period.</p> <p>Consequently, it can be concluded that there will be no significant effects from the impact mechanism to the QIs.</p> <p>It is possible to exclude the potential for significant effects at the Screening for AA stage.</p> <p>The QIs and impact mechanism combinations are screened out.</p>
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	Annex II Species	Geyer's Whorl Snail (<i>Vertigo geyeri</i>) [1013]	<p>The Project is predominantly marine and temporary in nature, with some presence in coastal and freshwater habitats. In relation to terrestrial habitats and species, there is no potential pathway for interaction between the impact mechanism and QI and are therefore excluded at the Screening for AA stage.</p> <p>Consequently, it can be concluded that there will be no significant effects from the impact mechanism to the QIs. There is no potential pathway for interaction between the impact mechanism and the QIs.</p> <p>The QIs and impact mechanism combinations are screened out.</p>
West Connacht Coast SAC (Site code: 002998)	Annex II Species	Tursiops truncatus (Common Bottlenose Dolphin) [1349] <i>Phocoena phocoena</i> (Harbour Porpoise) [1351]	The potential impacts of physical disturbance on marine mammals was assessed in section 6.1 and it was determined that there would be no significant effects on these QIs as a result of the project.
Clare Island SPA (Site code: 004136)	Annex II bird species	Fulmar (<i>Fulmarus glacialis</i>) [A009] Shag (<i>Phalacrocorax aristotelis</i>) [A018] Common Gull (<i>Larus canus</i>) [A182] Kittiwake (<i>Rissa tridactyla</i>) [A188] Guillemot (<i>Uria aalge</i>) [A199] Razorbill (<i>Alca torda</i>) [A200] Chough (<i>Pyrhocorax pyrrhocorax</i>) [A346]	Due to the nature of the Project, in that the survey equipment will either be underwater or occupying a small spatial extent, and temporary, there is no potential interaction between the impact mechanism and the QIs. It is therefore possible to exclude the potential for

Cross Lough (Killadoon) SPA (Site code: 004212)	Annex II bird species	Sandwich Tern (<i>Sterna sandvicencis</i>) [A191]	significant effect at the Screening for AA stage.
Owenduff/Nephin Complex SPA (Site code: 004098)	Annex II bird species	Merlin (<i>Falco columbarius</i>) [A098] Golden Plover (<i>Pluvialis apricaria</i>) [A140]	The QIs and impact mechanism combinations are screened out.

For noise disturbance, a wider geographic screening has been applied, reflecting the highly mobile nature of Annex II marine mammals and otter, and the potential for temporary disturbance beyond the immediate Zone of Influence. Accordingly, SACs supporting these species have been screened in on a precautionary basis where a credible source pathway - receptor linkage cannot be excluded.

Table 6.2: Impact Mechanism 2 – Noise.

Site	Qualifying Interest		Source-Pathway-Receptor Assessment
Clew Bay Complex SAC (Site code: 001482)	Annex I Habitat	Mudflats and sandflats not covered by seawater at low tide [1140] Coastal lagoons [1150] Large shallow inlets and bays [1160] Annual vegetation of drift lines [1210] Perennial vegetation of stony banks [1220] Atlantic salt meadows (<i>Glaucopuccinellietalia maritima</i>) [1330] Embryonic shifting dunes [2110] Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120] Machairs (* in Ireland) [21A0] Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0]	No Annex II species; no pathway. Screened out.

	Annex II Species	Otter (<i>Lutra lutra</i>) [1355] Harbour Seal (<i>Phoca vitulina</i>) [1365]	Potential for temporary disturbance from vessel noise during vessel-based MBES survey activity. Screened in for further assessment.
West Connacht Coast SAC (site code: 002998)	Annex II Species	Bottlenose dolphin (<i>Tursiops truncatus</i>) [1349] Harbour porpoise <i>Phocoena Phocoena</i>) [1351]	Potential for temporary disturbance from vessel noise associated with MBES survey activity. Screened in for further assessment.
Clare Island Cliffs SAC (Site Code: 002243)	Annex I Habitats	Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] Calcareous rocky slopes with chasmophytic vegetation [8210] Siliceous rocky slopes with chasmophytic vegetation [8220]	No Annex II species; no pathway. Screened out.
Newport River SAC (Site code: 002144)	Annex II species	Freshwater Pearl Mussel (<i>Margaritifera margaritifera</i>) [1029] Salmon (<i>Salmo salar</i>) [1106]	While vessel noise associated with survey activity may occur within Clew Bay, salmon migration in this area is not constrained to a narrow corridor but occurs across a broad spatial front in an open bay environment. There is no credible source - pathway - receptor linkage. Screened out.

Corraun Plateau SAC (Site code: 000485)	Annex I habitats	Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010] European dry heaths [4030] Alpine and Boreal heaths [4060] <i>Juniperus communis</i> formations on heaths or calcareous grasslands [5130] Siliceous scree of the montane to snow levels (<i>Androsacetalia alpinae</i> and <i>Galeopsietalia ladani</i>) [8110] Siliceous rocky slopes with chasmophytic vegetation [8220]	No Annex II species; no pathway. Screened out.
Oldhead Wood SAC (Site Code: 000532)	Annex I Habitats	European dry heaths [4030] Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0]	No Annex II species; no pathway. Screened out.
Owenduff/ Nephin Complex SAC (Site Code: 000534)	Annex II Species	Salmon (<i>Salmo salar</i>) [1106] Otter (<i>Lutra lutra</i>) [1355]	The Qualifying Interests in this SAC are associated with freshwater habitats. The proposed project is marine based, and underwater noise emissions from vessel-based MBES survey activity have no SPR linkage to these species in their freshwater context. Therefore, there is no potential for this interaction, and these species are screened out at the AA screening stage.
Inishbofin and Inishark SAC (Site Code: 000278)	Annex II Species	Grey seal (<i>Halichoerus grypus</i>) [1364]	Mobile Annex II species; precautionary disturbance pathway. Screened in for further assessment.

Kilkieran Bay and Islands SAC (Site Code: 002111)	Annex II Species	<i>Phocoena phocoena</i> (Harbour Porpoise) [1351] <i>Phoca vitulina</i> (Harbour Seal) [1365]	Mobile Annex II species; precautionary disturbance pathway. Screened in for further assessment.
Slyne Head Peninsula SAC [002074]	Annex II Species	<i>Tursiops truncatus</i> (Common Bottlenose Dolphin) [1349]	Mobile Annex II species; precautionary disturbance pathway. Screened in for further assessment
Duvillaun Islands SAC (Site code: 000495)	Annex II Species	Grey seal (<i>Halichoerus grypus</i>) [1364]	Mobile Annex II species; precautionary disturbance pathway. Screened in for further assessment
Inishkea Islands SAC (Site code: 000507)	Annex II Species	Grey seal (<i>Halichoerus grypus</i>) [1364] Bottlenose dolphin (<i>Tursiops truncatus</i>) [1349]	Mobile Annex II species; precautionary disturbance pathway. Screened in for further assessment
Inishmore Island SAC (Site Code: 000213)	Annex II Species	Harbour Porpoise (<i>Phocoena phocoena</i>)	Mobile Annex II species; precautionary disturbance pathway. Screened in for further assessment
Slyne Head Islands SAC (Site code: 000328)	Annex II Species	Bottlenose dolphin (<i>Tursiops truncatus</i>) [1349] Grey Seal (<i>Halichoerus grypus</i>) [1364]	Mobile Annex II species; precautionary disturbance pathway. Screened in for further assessment

Bunduff Lough and Machair/ Trawalua/ Mullaghmore SAC (Site Code: 000625)	Annex II Species	Harbour porpoise (<i>Phocoena phocoena</i>) [1351]	Mobile Annex II species; precautionary disturbance pathway. Screened in for further assessment
Killala Bay/Moy Estuary SAC (Site code: 000458)	Annex II Species	Harbour seal (<i>Phoca vitulina</i>) [1365]	Distance from the project area and rapid attenuation of high-frequency MBES noise precludes any realistic disturbance pathway. Screened out.
Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC (Site code: 000627)	Annex II Species	Harbour seal (<i>Phoca vitulina</i>) [1365]	Distance from the project area and rapid attenuation of high-frequency MBES noise precludes any realistic disturbance pathway. Screened out.
Ballysadare Bay SAC (Site code: 000622)	Annex II Species	Grey seal (<i>Halichoerus grypus</i>) [1364]	No relevant pathway. Screened out
Slieve Tooley/Tormore Island/Loughros Beg Bay SAC (Site code: 000190)	Annex II Species	Harbour seal (<i>Phoca vitulina</i>) [1365]	No relevant pathway. Screened out
West of Ardara/Maas Road SAC (Site code: 000197)	Annex II Species	Harbour seal (<i>Phoca vitulina</i>) [1365]	No relevant pathway. Screened out
Rutland Island and Sound SAC (Site code: 002283)	Annex II Species	Harbour seal (<i>Phoca vitulina</i>) [1365]	No relevant pathway. Screened out
Donegal Bay (Murvagh) SAC (Site code: 000133)	Annex II Species	Grey seal (<i>Halichoerus grypus</i>) [1364] Harbour porpoise (<i>Phocoena phocoena</i>) [1351]	No relevant pathway. Screened out.

Blasket Islands SAC (Site code: 002172)	Annex II Species	Grey seal (<i>Halichoerus grypus</i>) [1364]	No relevant pathway. Screened out
Horn Head and Rinclevan SAC (Site code: 000147)	Annex II Species	Harbour seal (<i>Phoca vitulina</i>) [1365]	No relevant pathway. Screened out
Kenmare River SAC (Site code: 002158)	Annex II Species	Grey seal (<i>Halichoerus grypus</i>) [1364] Harbour porpoise (<i>Phocoena phocoena</i>) [1351]	No relevant pathway. Screened out
Roaringwater Bay and Islands SAC (Site code: 000101)	Annex II Species	Grey seal (<i>Halichoerus grypus</i>) [1364]	No relevant pathway. Screened out.
Saltee Islands SAC (Site code: 000707)	Annex II Species	Harbour porpoise (<i>Phocoena phocoena</i>) [1351]	No relevant pathway Screened out.
Rockabill to Dalkey Island SAC (Site code: 003000)	Annex II Species	Bottlenose dolphin (<i>Tursiops truncatus</i>) [1349]	No relevant pathway Screened out.
St. John's Point SAC [000191]	Annex II Species	Bottlenose Dolphin (<i>Tursiops truncatus</i>) [1349]	Mobile Annex II species; precautionary disturbance pathway. Screened in for further assessment.
Porcupine Bank Canyon SAC [003001]	Annex II Species	Bottlenose dolphin (<i>Tursiops truncatus</i>) [1349]	No relevant pathway Screened out.
North-west Porcupine Bank SAC [002330]	Annex II Species	Bottlenose dolphin (<i>Tursiops truncatus</i>) [1349]	No relevant pathway Screened out.
South-west Porcupine Bank SAC [002329]	Annex II Species	Harbour porpoise (<i>Phocoena phocoena</i>) [1351]	No relevant pathway Screened out.

Belgica Mound Province SAC [002327]	Annex II Species	Bottlenose dolphin (<i>Tursiops truncatus</i>) [1349]	No relevant pathway Screened out.
Southern Canyons SAC [002278]	Annex II Species	Bottlenose dolphin (<i>Tursiops truncatus</i>) [1349] Harbour porpoise (<i>Phocoena phocoena</i>) [1351]	No relevant pathway Screened out.
Hook Head SAC [000764]	Annex II Species	Harbour porpoise (<i>Phocoena phocoena</i>) [1351]	No relevant pathway Screened out.
Carnsore Point SAC [002269]	Annex II Species	Harbour porpoise (<i>Phocoena phocoena</i>) [1351]	No relevant pathway Screened out.
Blackwater Bank SAC [002953]	Annex II Species	Harbour porpoise (<i>Phocoena phocoena</i>) [1351]	Distance from the project area and rapid attenuation of high-frequency MBES noise precludes any realistic disturbance pathway. Screened out.
Codling Fault Zone SAC [003015]	Annex II Species	Harbour porpoise (<i>Phocoena phocoena</i>) [1351]	No relevant pathway Screened out.
Lough Swilly SAC [002287]	Annex II Species	Harbour porpoise (<i>Phocoena phocoena</i>) [1351]	No relevant pathway Screened out.
Clare Island SPA [004136]		Fulmar (<i>Fulmarus glacialis</i>) [A009] Shag (<i>Phalacrocorax aristotelis</i>) [A018] Common Gull (<i>Larus canus</i>) [A182] Kittiwake (<i>Rissa tridactyla</i>) [A188] Guillemot (<i>Uria aalge</i>) [A199] Razorbill (<i>Alca torda</i>) [A200] Chough (<i>Pyrrhocorax pyrrhocorax</i>) [A346]	No relevant pathway. Screened out

Owenduff/ Nephin Complex SPA [004098]		Merlin (<i>Falco columbarius</i>) [A098] Golden Plover (<i>Pluvialis apricaria</i>) [A140]	No relevant pathway Screened out.
Cross Lough (Killadoon) SPA [004212]		Sandwich Tern (<i>Thalasseus sandvicensis</i>) [A863]	No relevant pathway Screened out.
Bills Rocks SPA [004177]		Storm Petrel (<i>Hydrobates pelagicus</i>) [A014] Puffin (<i>Fratercula arctica</i>) [A204]	No relevant pathway Screened out.

Visual and above-water disturbance pathways are spatially constrained and limited to the immediate vicinity of survey activity; therefore, only SACs within a precautionary screening distance of approximately 0-100 km from the Project area (reflecting the maximum ranges of Annex II species and site proximity) are considered for this impact mechanism.

Table 6.3 Impact mechanism 3- Visual / above water disturbance

European Site	Qualifying Interest		Source Pathway Receptor
Clew Bay Complex SAC (001482)	Annex II Species	Otter (1355) Harbour seal (1365)	Intermittent vessel activity and aerial drone operations may result in short-term visual or above-water disturbance to mobile Annex II species within or adjacent to the SAC. Potential for localised, temporary behavioural response cannot be excluded. Screened in for further assessment
West Connacht Coast SAC (002998)	Annex II Species	Bottlenose dolphin (1349) Harbour porpoise (1351)	Vessel presence within coastal waters may result in short-term visual disturbance to mobile marine mammals. Potential for localised, temporary behavioural response cannot be excluded. Screened in for further assessment.

Inishbofin & Inishshark SAC (000278)	Annex II Species	Grey seal (1364)	Mobile Annex II species present in coastal waters. Potential for temporary visual disturbance from vessel activity. Screened in for further assessment.
Kilkieran Bay and Islands SAC (002111)	Annex II Species	Harbour porpoise (1351); Harbour seal (1365)	Mobile Annex II species present in nearshore waters. Potential for short-term visual disturbance from vessels. Screened in for further assessment.
Slyne Head Peninsula SAC (002074)	Annex II Species	Bottlenose dolphin (<i>Tursiops truncatus</i>) [1349]	Mobile Annex II species present in adjacent coastal waters. Potential for short-term visual disturbance from vessel presence. Screened in for further assessment.
Slyne Head Islands SAC (000328)	Annex II Species	Bottlenose dolphin (<i>Tursiops truncatus</i>) [1349]; Grey seal (<i>Halichoerus grypus</i>) [1364]	Mobile Annex II species present in adjacent coastal waters. Potential for short-term visual disturbance from vessel presence. Screened in for further assessment.
Inishkea Islands SAC (000507)	Annex II Species	Grey seal (<i>Halichoerus grypus</i>) [1364]; Bottlenose dolphin (<i>Tursiops truncatus</i>) [1349]	Mobile Annex II species present in adjacent coastal waters. Potential for short-term visual disturbance from vessel presence. Screened in for further assessment.

6.3. Plans or Projects That Might Act In Combination

As outlined above the obligation to undertake AA under the 2011 Birds and Natural Habitats Regulations derives from the Habitats Directive. Regulation 42(1) of the 2011 Regulations requires that:

A screening for Appropriate Assessment of a plan or project for which an application for consent is received, or which a public authority wishes to undertake or adopt, and which is not directly connected with or necessary to the management of the site as a European Site, shall be carried out by the public authority to assess, in view of best scientific knowledge and in view

*of the conservation objectives of the site, if that plan or project, individually or **in combination with other plans or projects** is likely to have a significant effect on the European site.*

It is therefore required that the potential impacts of the proposed Project be considered in combination with other relevant plans or projects. Given the nature of the proposed activities associated with the Project, the potential project impact mechanisms (or sources of impact) are:

1. Physical presence and temporary installation of survey equipment (including flow gauges, weather stations, tidal gauges, current meters, and associated deployment infrastructure)
2. Physical presence and movement of survey vessels and remotely operated equipment vessels associated with MBES surveys.
3. Underwater noise emissions associated with vessel activity during MBES surveys.
4. Visual and above-water disturbance associated with vessel presence and aerial drone operations.

The assessment of potential in-combination effects considers other plans and projects that may result in cumulative significant effects on the qualifying interests (QIs) and special conservation interests (SCIs) of SACs and SPAs.

The identification of plans and projects for the in-combination assessment was informed by professional judgement, having regard to the nature, scale and temporary character of the proposed Project, the impact pathways identified (including underwater noise, vessel presence and visual disturbance), and the ecological sensitivity and mobility of relevant qualifying interests and special conservation interests.

In completing this assessment, regard was also had to the Appropriate Assessment Screening and Determination undertaken by the Maritime Area Regulatory Authority (MARA) for the proposed Project. In that determination, MARA defined a cumulative effects spatial scope of 10 km, based on JNCC guidance on acoustic disturbance to mobile marine receptors, and concluded that no other plans or projects within that scope had the potential to act in combination with the proposed maritime usage.

To inform the assessment of potential in-combination effects, a review of consent applications for projects in the vicinity of the proposed Project, as listed on the following websites, was completed in April 2024:

- Maritime Area Regulatory Authority
 - <https://www.maritimeregulator.ie/our-work/maritime-usage-licences/applications/>

- DHPLG - EIA Portal
 - <https://www.housing.gov.ie/planning/environmental-assessment/environmental-impact-assessment-eia/eia-portal>
- Mayo County Council - Planning System
 - <https://www.eplanning.ie/MayoCC/searchtypes>
 - <https://mayococo.maps.arcgis.com/apps/webappviewer/index.html?id=2b1fc4da0e214d25b5727fecb908ae27>

The assessment of potential in-combination effects also considered *negative impacting threats and pressures* and *positive impacting activities/management* affecting the sites as identified in Natura 2000 forms published for the SPA and SAC sites available through the NPWS website (<https://www.npws.ie/protected-sites>).

Screening assessments of potential cumulative or in-combination effects from current and proposed projects listed on the above websites are summarised in Table 6.4

In summary, the assessments presented in Table 6.4 conclude that there is no potential likelihood for significant effects caused by cumulative or in-combination effects.

It was concluded that the potential for significant effects cannot be excluded for Annex II species due to underwater noise disturbance and visual and above-water disturbance associated with the proposed Project. Stage 2 Appropriate Assessment is therefore required for these species.

Table 6.4: Assessment of potential in combination effects.

Website	Project Details	File Reference	Date Application Received	Assessment of Potential Cumulative or In-combination Effects	Conclusion
DHPLG - EIA Portal	A search of the DHPLG EIA Portal was undertaken to examine projects with potential for in-combination effects.	2021188	22/9/2021	Though applications for finfish aquaculture sites occur close to the site, it was determined that there was no potential for in-combination effects to occur with the proposed Project.	No potential significant cumulative or in-combination effects
		2021189	22/9/2021		
		2021191	23/9/2021		
		2023019	8/2/2023		
		2023180	14/11/2023		
		2024059	2/4/2024	Construction of a new firewater retention facility; demolition of existing derelict furniture store; new 152no. bay car park, new 119no. bay car park; and ancillary works. An NIS was carried out and determined that this project would have no significant effects with the proposed mitigation in place. This along with the lack of significant effects identified in the current project will result in no potential significant cumulative or in combination effects	No potential significant cumulative or in combination effects
Mayo County Council - Planning System	A search of the Mayo planning databases was undertaken to examine projects with potential for in-combination effects.	-	-	Applications made typically to County Councils and published on the planning database consisted of extensions and renovations to existing houses, and retention of existing developments. These are small-scale terrestrial developments which do not have the potential to result in cumulative effects in combination with the proposed Project.	No potential significant cumulative or in-combination effects

6.4. Screening Outcome

The current assessment investigates the potential for the proposed Project to have significant effects on European Sites within the Natura 2000 network.

The assessment has determined, in light of best available scientific data, that the potential for significant effects cannot be excluded for Annex II species due to underwater noise disturbance and visual/above-water disturbance associated with the proposed Project. Stage 2 Appropriate Assessment is required for these species.

The findings of the assessment are summarised in **Table 6.5**.

Table 6.5 Screening matrix of the proposed Project.

Screening Matrix	
Brief description of the Project or plan	The objective of the Project is to deploy, install and operate numerous pieces of equipment for marine surveys for Uisce Éireann records in Clew Bay, Newport, Co. Mayo (Figure 1-1, Figure 1-2, Figure 1-3 & Figure 1-4). The Project comprises the deployment, installation and operation of the survey equipment throughout the bay area for a minimum period of 35 days with the aim to collect meteorological, tidal, current, river flow, bathymetric, water quality and dye tracing data of the area.
European Site(s)	
Brief description of the European site(s)	<p>The following European sites within the ZOI considered in this screening for Appropriate Assessment are:</p> <ul style="list-style-type: none"> • Clew Bay Complex SAC • West Connacht Coast SAC • Corraun Plateau SAC • Oldhead Wood SAC • Owenduff/Nephin Complex SAC • Newport River SAC • Clare Island Cliffs SAC • Owenduff/Nephin Complex SPA • Clare Island SPA <p>In addition, because Annex II marine mammal species are highly mobile and may undertake foraging and movement over large distances (with recorded maximum ranges up to 200–220 km), all SACs in Ireland designated for the following Annex II species were considered:</p> <ul style="list-style-type: none"> • Harbour porpoise (<i>Phocoena phocoena</i>) • Bottlenose dolphin (<i>Tursiops truncatus</i>) • Grey seal (<i>Halichoerus grypus</i>) • Harbour seal (<i>Phoca vitulina</i>)

	<p>These SACs were considered irrespective of distance from the Project area, in order to apply the precautionary principle and ensure all potential ecological connectivity routes were evaluated. Where a relevant source – pathway - receptor linkage could not be excluded, sites were taken forward for further assessment.</p> <p>The outcomes of this screening process are presented in Tables 6.1–6.3, which identify those European sites and conservation features for which likely significant effects could not be excluded.</p>
Assessment Summary	
<p>Description of the potential impact mechanisms from the Project that have likely significant effects on the conservation features.</p>	<p>All potential impact mechanisms are detailed in Section 2.3. Here follows the impact mechanisms for which likely significant effects have been identified:</p> <ol style="list-style-type: none"> 1. Underwater noise and vibration (MBES, vessel activity). 2. Visual and above water disturbance (aerial drones, vessel presence). <p>These pathways have a potential SPR linkage with Annex II marine mammal species.</p>
<p>Conservation features with the potential to be impacted by the Project.</p>	<ul style="list-style-type: none"> • Otter (<i>Lutra lutra</i>) [1355] • Harbour seal (<i>Phoca vitulina</i>) [1365] • Bottlenose Dolphin (<i>Tursiops truncatus</i>) [1349] • Harbour Porpoise (<i>Phocoena phocoena</i>) [1351] • Grey seal (<i>Halichoerus grypus</i>) [1364] <p>*These species occur in several SACs within movement ranges extending up to 220km.</p> <p>SAC's Include:</p> <ul style="list-style-type: none"> • Clew Bay Complex SAC • West Connacht Coast SAC • Inishbofin & Inishark SAC • Kilkieran Bay and Islands SAC • Slyne Head Peninsula SAC • Slyne Head Islands SAC • Inishkea Islands SAC • Duvillaun Islands SAC • Inishmore Island SAC • Bunduff Lough and Machair / Trawalua / Mullaghmore SAC • St. John's Point SAC
<p>Description of the potential direct or indirect impacts of the Project in combination with other plans or projects on the European sites.</p>	<p>No plans or projects identified to have potential in combination effects with the survey works proposed in Clew Bay.</p>
<p>Distance from European sites</p>	<p>Several deployment locations (T4, T5, T6, W2, A4, A5) lie within Clew Bay Complex SAC. T2 and T3 lie within West Connacht SAC.</p> <p>F2 lies within Newport River SAC.</p>

	Other SACs lie within precautionary movement ranges of Annex II species identified.
Resource requirements (water abstraction etc.);	Deployment of the marine survey equipment requires little service maintenance, and the deployment period is relatively short-term (minimum of 35 days). No resources will be required for the Project.
Emissions (disposal to land, water or air);	Noise emissions from operation of current meters and an MBES. Rhodamine WT and microbial dye used at concentrations below ecotoxicological thresholds.
Excavation requirements, Transportation requirements;	Excavation requirements No excavation will be required Transportation requirements All survey equipment, except for the weather stations, will require boating transport for deployment at the sites throughout the bay. A work vehicle will be required to transport the weather stations.
Duration of construction, operation, Decommissioning, Other;	Details on survey equipment and associated timeframes for the proposed Project are provided above in Section 1.1 Upon completion of the surveys, the marine survey equipment will be retrieved wherein all equipment will leave the Project area. It is anticipated that deployment operations will commence in 2026.
Describe any likely changes to the site arising as a result of: Reduction in habitat area; Disturbance to key species; Habitat or species fragmentation; Reduction in species density; Changes in key indicators of conservation value (water quality etc.). Climate change	<ul style="list-style-type: none"> • Reduction in habitat area: None. Physical disturbance is negligible and temporary. • Disturbance to key species: Cannot be excluded for Annex II marine mammals and otter due to noise and visual disturbance. • Habitat or species fragmentation: None • Reduction in species density: none identified; behavioural disturbance cannot be ruled out. • Water quality: None, as dye concentrations are far below ecotoxicological thresholds. • Climate change: Negligible due to very low vessel emissions.
Describe any likely impacts on the Natura 2000 site in terms of: Interference with the key relationships that define the structure of the site; Interference with key relationships that define the function of the site.	Physical and ecological structure and function are unaffected, however, behavioural disturbance to mobile marine mammals cannot be excluded, requiring Stage 2 AA.
Provide indicators of significance as a result of the identification of effects set out above in terms of: Loss; Fragmentation; Disruption; Disturbance; Change to key elements of the site.	<ul style="list-style-type: none"> • Potential behavioural disturbance of Annex II species • Temporary avoidance of vessels or drones • Possible short-term displacement within foraging or transit areas. <p>These cannot be excluded on a precautionary basis.</p>

Describe from the above those elements of the Project or plan, or combination of elements, where the above impacts are likely to be significant or where the scale or magnitude of impacts is not known.	Underwater noise from MBES and above water disturbance from vessels and drone represent sources of uncertainty where significant effects cannot be ruled out.
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Outcome: The screening for Appropriate Assessment has considered the potential for the proposed Project to give rise to significant effects on European Sites, alone or in combination with other plans or projects, in view of their conservation objectives and best available scientific knowledge.

On the basis of the assessment presented in Sections 6.1 and 6.2, and summarised in Tables 6.1 to 6.3, it has been concluded that all potential impact mechanisms can be screened out **except** for:

- Underwater noise and vibration associated with MBES and vessel activity
- Visual and above-water disturbance associated with vessel presence and aerial drone operations

In light of the highly mobile nature of Annex II marine mammal species and otter, and applying the precautionary principle, the potential for significant effects **cannot be excluded** for these species. Accordingly, Stage 2 Appropriate Assessment is required.

The European Sites taken forward to Stage 2 Appropriate Assessment are:

- Clew Bay Complex SAC
- West Connacht Coast SAC
- Inishbofin & Inishark SAC
- Kilkieran Bay and Islands SAC
- Slyne Head Peninsula SAC
- Slyne Head Islands SAC
- Inishkea Islands SAC
- Duvillaun Islands SAC
- Inishmore Island SAC
- Bunduff Lough and Machair / Trawalua / Mullaghmore SAC
- St. John's Point SAC

All other European Sites considered during Stage 1 Appropriate Assessment have been screened out due to the absence of a credible source - pathway - receptor linkage with the proposed works.

7. Stage 2: Natura Impact Statement

7.1. Overview

Stage 2 of the Appropriate Assessment process considers whether the plan or project, alone or in combination with other projects or plans, will have adverse effects on the integrity of a European site, and includes any mitigation measures necessary to avoid, reduce or offset negative effects. The proponent of the plan or project will be required to submit a Natura Impact Statement (NIS), that examines the plan or project and the relevant European sites, to identify and characterise any possible implications for the site in view of the site's conservation objectives, accounting for in-combination effects. This should provide information to enable the competent authority to carry out the appropriate assessment. If the assessment deems that adverse effects on the integrity of a site cannot be excluded, then the process must proceed to Stage 3, or the plan or project should be abandoned.

7.1.1. Background

Following submission of the original Screening for Appropriate Assessment report to the Maritime Area Regulatory Authority (MARA) (MUL230037) a Screening Determination was issued confirming that the competent authority could not exclude the likelihood of significant effects on certain European sites. MARA concluded that Stage 2 Appropriate Assessment was required for the Project under Article 6(3) of the Habitats Directive.

In their determination, MARA identified that the potential for significant effects relates specifically to:

- **Underwater noise disturbance** associated with geophysical survey activity (including MBES and deployment vessels); and
- **Above-water visual and noise disturbance** arising from vessel activity and intermittent drone use.

The Qualifying Interests screened in for Stage 2 assessment, and the European sites for which they are designated, are:

- **Otter (*Lutra lutra*)**

- Clew Bay Complex SAC [001482]

- **Harbour seal (*Phoca vitulina*)**

- Clew Bay Complex SAC [001482]

- **Bottlenose dolphin (*Tursiops truncatus*)**

- West Connacht Coast SAC [002998]

- Slyne Head Peninsula SAC [002074]
- Inishkea Islands SAC [000507]
- Slyne Head Islands SAC [000328]
- Duvillaun Islands SAC [000495]
- St John’s Point SAC [000191]
- **Harbour porpoise (*Phocoena phocoena*)**
 - West Connacht Coast SAC [002998]
 - Kilkieran Bay & Islands SAC [002111]
 - Inishmore Island SAC [000213]
 - Bunduff Lough & Machair / Trawalua / Mullaghmore SAC [000625]
- **Grey seal (*Halichoerus grypus*)**
 - Inishbofin & Inishshark SAC [000278]
 - Inishkea Islands SAC [000507]
 - Duvillaun Islands SAC [000495]
 - Slyne Head Islands SAC [000328]

This NIS gives a detailed ecological assessment of European sites and their associated conservation features, considering inter alia site-specific or activity-specific impacts. In preparation of this NIS, the NPWS-DELGH (2009; revised 2010)/NPWS-DAHG (2012) guidance document on marine NIS in SACs was used

In line with NPWS-DEHLG (2009; revised 2010) guidance, the Stage 2 AA consists of three main steps:

1. **Impact Prediction** - where the likely impacts of the Project are examined. A source-pathway-receptor model has been used to assess potential for impact.
2. **Assessment of Effects** – where the effects of the Project are assessed as to whether they have any adverse effects on the integrity of European Sites as defined by conservation objectives.
3. **Mitigation Measures** – where mitigation measures are identified to ameliorate any adverse effects on the integrity of any European site.

A number of European Sites have been taken forward to Stage 2 Appropriate Assessment solely on a precautionary basis due to the highly mobile nature of Annex II marine mammal species. Inclusion at Stage 2 does not imply that adverse effects are predicted at these sites but reflects the requirement to assess whether such effects can be objectively ruled out in view of conservation objectives.

7.2. Impact Prediction

The following sections assess the potential for impacts arising from the impact mechanisms that were screened in at Stage 1 Appropriate Assessment Screening. The assessment considers whether these mechanisms, either alone or in combination with other plans or projects, could adversely affect the integrity of European Sites, having regard to their conservation objectives and best available scientific knowledge.

Based on the Stage 1 screening outcomes, the following impact mechanisms are considered in Stage 2:

- Noise and vibration associated with operation of multibeam echo sounders (MBES).
- Visual and above water disturbance associated with vessel presence and aerial drone operations.

These impact mechanisms have a potential source–pathway–receptor linkage with **Annex II species**, including marine mammals and otter, which are qualifying interests of several Special Areas of Conservation (SACs) considered in this assessment.

Sections 7.2.1 and 7.2.2 provide a detailed assessment of the screened-in impact mechanisms in relation to the relevant conservation features.

7.2.1. Potential Impact Mechanism 1 – Noise and Vibration

7.2.1.1. Potential Receptors

Species - Habitats Directive (Annex II)

The proposed survey works will generate limited underwater noise and vibration associated with the use of multibeam echo sounders (MBES) and small survey vessels. No intrusive geotechnical or geophysical techniques such as drilling, coring, percussion boreholes, cone penetration testing, or seismic surveys will be undertaken as part of this project.

The primary underwater noise relevant to Annex II marine mammals is expected to arise from low-frequency vessel and propulsion noise associated with survey activity. The MBES system used for shallow-water surveying typically operates at high frequencies (hundreds of kHz), which lie above the functional hearing range of Annex II marine mammals, and is therefore not expected to result in auditory injury. High-frequency signals also attenuate rapidly in shallow coastal waters. Accordingly,

the principal pathway for potential behavioural disturbance is associated with vessel presence and movement during MBES survey operations.

Vessel movements may generate low-frequency noise that is detectable to marine mammals; however, these emissions are low-intensity, intermittent, and restricted to the immediate survey area. Such noise sources are orders of magnitude below those associated with piling, seismic airguns, dredging or heavy geotechnical works, and are not expected to cause significant behavioural changes, masking, or displacement.

Species listed under Annex II of the Habitats Directive, including harbour porpoise, bottlenose dolphin, harbour seal, grey seal, and otter, may be present within Clew Bay at the time of the surveys. While these species can be sensitive to anthropogenic noise, particularly at low and mid frequencies, the non-intrusive and low-intensity nature of the proposed works means that only very small, temporary behavioural responses (such as brief localised avoidance of vessels) could occur, and only within tens to hundreds of metres of the survey equipment.

The potential significance of any disturbance depends on local species presence and conservation sensitivities within relevant European sites. Given the short duration, low magnitude, and highly localised footprint of the proposed works, the potential for significant effects on the conservation objectives of any European site is considered low. Mitigation measures described in Section 8.2.1.3 will further reduce the risk of disturbance to Annex II species.

7.2.1.2. Impact Assessment

The proposed survey operations will generate limited underwater noise primarily from small vessel engines and propulsion associated with survey activity and vessel-based MBES operations. Additional airborne noise will arise intermittently from drones during LiDAR and tracer-tracking surveys. No geotechnical or sediment-disturbing activities are proposed, and there are no impulsive or high-energy acoustic sources associated with the project.

Marine mammals, including harbour porpoise, bottlenose dolphin, harbour seal, and grey seal- may occur within Clew Bay and could be exposed to survey noise within the immediate zone of operation. However, MBES and ADCP systems operate at very high frequencies (300–1200 kHz) that lie above the functional hearing ranges of these species. Consequently, these signals are unlikely to be detected and are not expected to elicit behavioural responses. The only noise source with potential behavioural relevance is the low-frequency output from small survey vessels, which may cause short-term, localised avoidance behaviour within close proximity of the vessel. Given the limited vessel size, low engine power, and intermittent operation, the potential for significant disturbance is low.

Otter is a qualifying interest of the Clew Bay Complex SAC and is known to occur along the coastline, rivers and sheltered inlets of the bay. Otters typically forage in shallow coastal waters and return to holts or resting couches located within the intertidal or immediately adjacent supratidal zone. Otter is generally tolerant of routine human activity and vessel presence and is regularly recorded in working harbours and navigated waterways. The Project does not include works on land or within the intertidal zone and does not require any vegetation clearance or excavation that could disturb holts or resting sites. All survey activity will occur offshore or from vessels and will be temporary and intermittent in nature. The scale and footprint of activity is small relative to the extent of available habitat, and activity will not block shoreline access, fragment habitat, or alter prey availability.

Annex I marine and coastal habitats within Clew Bay are not sensitive to acoustic disturbance. Indirect effects on prey species (fish, invertebrates, plankton) are expected to be minimal due to the low intensity, narrow spatial footprint, and short duration of survey noise emissions. Consequently, no meaningful impacts on foraging birds or other higher trophic levels are anticipated.

Overall, underwater noise and vibration arising from the proposed non-intrusive surveys are assessed as highly localised, short-term, and fully reversible. While minor temporary behavioural reactions in marine mammals cannot be entirely excluded, the absence of intrusive acoustic sources, combined with the small spatial footprint of the works, mean that significant effects on the conservation objectives of any European Site are highly unlikely. Standard precautionary mitigation measures will nonetheless be implemented.

Given the small size of survey vessels, low operating speeds, intermittent vessel movements and short duration of survey activities, the risk of collision with marine mammals or otter is considered negligible. No deliberate approach to marine mammals or otter will occur, and standard marine mammal observation procedures will be implemented.

7.2.1.3. Mitigation Measures

Mitigation measures will be implemented in accordance with NPWS (DAHG, 2014) guidance and with due regard to the Maritime Area Regulatory Authority (MARA) Guidance Note on Marine Mammal and Seabird Observations during Licensed Activities at Sea (October 2025). Where relevant, MARA guidance on observer competency, reporting, and communication protocols will be applied.

Marine Mammals (Annex II species)

Although the proposed works are non-intrusive and the MBES system operates at frequencies above the hearing range of marine mammals, standard mitigation in line with NPWS (DAHG, 2014) "Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters" will be

implemented as a precaution during vessel based MBES survey activity due to the designation of the survey area for harbour seal, bottlenose dolphin, otter and harbour porpoise.

- A suitably qualified Marine Mammal Observer (MMO) will be appointed for periods when vessel based MBES surveying is being undertaken. The MMO will carry out a 30-minute pre-start visual watch within a 500 m Monitoring Zone. If any marine mammal (harbour porpoise, bottlenose commencement of MBES survey activity will be delayed until the animal has left the zone, or until a 30-minute clearance period passes without further sightings.
- A soft start (ramp-up) procedure will be used where possible, gradually increasing acoustic output over 20 - 40 minutes to allow animals time to move away.
- Survey operations will only commence during daylight hours when effective visual monitoring can be ensured.
- If MBES survey activity stops for more than 30 minutes, the pre-start monitoring procedure will be repeated before recommencing.
- Vessel speeds will be minimised (<6 knots where practicable) within the survey area to reduce collision risk and underwater noise from engine/propeller cavitation.
- Clear communication procedures will be maintained between the MMO and survey crew to ensure real-time decision-making on start-up, shutdown, and resumption of works.
- MMO observations, mitigation actions, and any sightings will be recorded in standardised logbooks and reporting templates, retained for audit, and made available to MARA upon request.
- All vessel crew will be briefed on MMO procedures, reporting requirements, and mitigation decision-making prior to survey commencement.

Once MBES surveying has commenced and the pre-start procedures have been completed and cleared by the MMO, operations may continue at night or during poor visibility, as continuous activity is considered less disruptive than repeated start-ups.

7.2.1.4. Conclusion

The proposed survey works comprise non-intrusive data collection methods, including multibeam echosounder (MBES) surveys and limited small-vessel activity. These activities will generate low-level underwater noise, primarily in the form of high-frequency acoustic emissions from MBES and low-frequency noise associated with vessel engines and propulsion.

The survey techniques do not involve intrusive geotechnical or geophysical activities and will not generate medium- or high-intensity underwater acoustic emissions. The MBES system operates predominantly at high frequencies (300–1200 kHz), which lie outside, or at the upper limits of, the functional hearing ranges

of Annex II marine mammal species. As a result, any acoustic disturbance arising from these sources is expected to be highly localised and restricted to a small area surrounding the operating equipment. Noise generated by support vessels may be detectable at close range but will be intermittent, low powered, and of short duration.

While short-term and localised behavioural responses by marine mammals, including harbour porpoise, bottlenose dolphin, harbour seal and grey seal, cannot be entirely excluded, the magnitude, spatial extent and duration of any such responses are expected to be very limited. These responses would not interfere with key life-history functions such as foraging, breeding or migration and would not undermine the conservation objectives of any European site.

Otter, as a semi-terrestrial Annex II species, is not sensitive to high-frequency underwater noise. Any potential disturbance would be limited to brief, localised responses associated with vessel presence rather than acoustic emissions and would be temporary and reversible.

With the implementation of the mitigation measures outlined above, underwater noise and vibration arising from the proposed Project will not result in adverse effects on the integrity of any European site, either alone or in combination with other plans or projects, in view of their conservation objectives.

7.2.2. Potential Impact Mechanism 2 – Visual and Above Water Disturbance

7.2.2.1. Potential Receptors

Species – Habitats Directive (Annex II)

Visual and above-water disturbance may arise from intermittent vessel movements, deployment and retrieval of survey equipment, and limited aerial drone operations undertaken to support LiDAR and dye-tracing surveys. These activities may result in temporary visual stimuli or above-water noise detectable by mobile Annex II species within or adjacent to the survey area.

Annex II species that may be present within Clew Bay and surrounding coastal waters include harbour porpoise, bottlenose dolphin, harbour seal, grey seal and otter. These species are highly mobile and may encounter survey activity while foraging, transiting or resting within nearshore or coastal habitats.

Aerial drone operations will be undertaken on a limited number of occasions and for short durations. While collision risk to birds is considered negligible due to adherence to operational controls and the temporary nature of flights, drones may be visually detectable to marine mammals at the water surface and to otter along the shoreline. Similarly, vessel presence may be visually perceptible to marine mammals and otter in close proximity to survey activity.

7.2.2.2. Impact Assessment

Vessel presence and aerial drone activity may result in short-term, localised visual disturbance to marine mammals or otter within the immediate vicinity of survey operations. Potential responses may include brief alert behaviour or temporary avoidance of the active survey area.

Given the limited spatial extent, short duration, and intermittent nature of these activities, any disturbance would be temporary and fully reversible. Animals would be able to move freely away from the area, and no long-term displacement, habitat exclusion, or interference with key life-history functions (e.g. breeding, resting or foraging) is anticipated.

Above-water disturbance from vessel movement and intermittent drone use may be detected by otter within the immediate vicinity of survey works; however, any response would be temporary and localised and would not interfere with normal foraging or movement patterns. Drone operations will avoid the immediate shoreline zone used by otter, and vessel movements will maintain distance from the waterline except where necessary for deployment or retrieval of instruments.

Visual disturbance effects are therefore considered to be of low magnitude and short duration. With the implementation of standard mitigation measures, adverse effects on the integrity of European sites are not expected.

7.2.2.3. Mitigation Measures

The following mitigation measures will be implemented to minimise visual and above-water disturbance:

- Vessel speeds will be minimised where practicable within the survey area.
- Sudden changes in vessel direction or speed will be avoided where marine mammals or otter are observed nearby.
- Aerial drone surveys will be short in duration and will avoid repeated overflight of the same area.
- Drones will not deliberately approach marine mammals, otters, or seabird aggregations.
- Survey personnel will maintain awareness of marine fauna and implement avoidance measures where appropriate.

7.2.2.4. Conclusion

Visual and above-water disturbance arising from the proposed survey works will be temporary, localised and fully reversible. While minor behavioural responses by Annex II species cannot be entirely excluded on a precautionary basis, the limited spatial extent, short duration and non-intrusive nature of the

activities mean that no adverse effects on the integrity of any European site are anticipated, either alone or in combination with other plans or projects, in view of their conservation objectives.

No injury, mortality, habitat loss, habitat fragmentation or permanent displacement of Annex II species or Annex I habitats is predicted as a result of the proposed survey activities. Any potential disturbance effects would be short-term, localised and fully reversible.

7.3. Summary of Mitigation Measures

The following mitigation measures will be implemented in full for the duration of the Project to avoid disturbance effects on mobile Annex II marine mammal species. These measures are integral to the Project design and will be secured by condition and adhered to throughout all survey activity.

- **(1) Mitigation for underwater noise disturbance associated with vessel- based MBES survey activity.**

Mitigation measures are based on NPWS (2014) national guidance for managing the risk to marine mammals from man-made sound sources in Irish waters.

a. Pre-Start Visual Monitoring:

A suitably qualified Marine Mammal Observer (MMO) will undertake a 30-minute pre-start clearance scan before the commencement of vessel based MBES surveying. Surveys will not commence until the 30-minute window has been completed with no Annex II marine mammal sightings within 500 m of the vessel or equipment.

b. Soft Start Procedures:

Where technically feasible, MBES survey activity will be initiated at the lowest practicable power output and progressively increased over a minimum period of 20 minutes to allow marine mammals to move away from the immediate survey area.

c. Temporary Cessation if QIs Approach:

If Annex II marine mammals are observed within 500 m of the vessel or active survey equipment, survey activity will cease until animals have moved beyond this distance or have not been re-sighted for 20 minutes.

d. Vessel Speed Management:

Survey and support vessels will operate at slow, predictable speeds (generally <6 knots during survey manoeuvres), avoiding rapid course changes where practicable, to minimise underwater noise output and collision risk.

e. Night-time Operations:

Where feasible, MBES survey activity will be scheduled in daylight hours to maximise visual monitoring effectiveness. Where night-time operations are required, forward lighting and thermal/binocular optics will be used to maintain detection capability.

F. Briefing

All personnel involved in MBES survey operations will be briefed by the MMO regarding the above measures before work commences. Compliance will be recorded in a daily log and made available to MARA upon request.

- **(2) Mitigation for above-water visual disturbance (drones, vessels, shoreline activity)**

a. Drone Buffer Distances:

Drones will not operate within 150 m laterally of seal haul-out locations or within 100 m of shoreline habitats used by otter. Drone flight altitude will be maintained above 50 m except for safe take-off and landing.

b. Drone Timing:

Drone operations will be scheduled to avoid periods of low tide where haul-out use by seals may peak, unless required for safety or survey purposes, in which case the buffer distance will be strictly maintained.

c. Vessel Shoreline Setback:

Vessels will avoid operating within 100 m of shorelines and intertidal areas identified as supporting otter activity, except where instrument deployment/recovery is required.

- **(3) Implementation**

Implementation of the mitigation measures described above will ensure that any disturbance to Annex II marine mammals and otter will be strictly limited to temporary and localised behavioural responses, with no measurable effect on conservation objectives, population status, habitat use, or

distribution. Accordingly, no adverse effects on the integrity of any European site, either alone or in combination with other plans or projects, will arise.

7.4. Plans or Projects that might act in-combination

In accordance with MARA's Screening Determination (MUL230037), a review of other plans and projects within a 10 km radius and a five-year temporal window found no projects that would give rise to in-combination disturbance effects relevant to the qualifying interests of the screened-in European sites. MARA concluded at Stage 1 that the Project did not give rise to any significant risks of in-combination effects.

The Stage 2 assessment in this NIS has further considered potential in-combination effects relating specifically to underwater noise and above-water disturbance pathways and the qualifying interests of the relevant SACs, in view of their conservation objectives. No mechanism has been identified by which the Project, in combination with other plans or projects, could alter the structure or function of any screened-in site, impede the achievement of conservation objectives, or otherwise interact to generate adverse effects on site integrity.

Accordingly, it is concluded that the Project will not result in adverse effects on the integrity of any European site when considered in combination with other plans or projects.

7.5. Conclusion

This Natura Impact Statement has considered, in view of best scientific knowledge and the conservation objectives of the relevant European sites, whether the Project would adversely affect the integrity of those sites, either alone or in combination with other plans or projects.

With the implementation of the mitigation measures set out in **Section 7.3**, the Project will not adversely affect the structure, function or conservation objectives of any screened-in European site. No reasonable scientific doubt remains regarding this conclusion.

Accordingly, it is determined that the Project will not result in adverse effects on the integrity of any European site, either alone or in combination with other plans or projects, in view of their conservation objectives.

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