Appendix 2A

Construction and Environmental Management Plan

MWP

Ros an Mhíl Deep Water Quay

Construction and Environmental Management Plan (CEMP)

Department of Agriculture, Food and the Marine

November 2025

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Project No.	Doc. No.	Rev.	Date	Prepared By	Checked By	Approved By	Acceptance Code / Status
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1. Introduction

The Department of Agriculture, Food and the Marine (DAFM), the 'Applicant', intends to make an application to An Coimisiún Pleanála (ACP) under section 37L of the Planning and Development Act 2000, as amended, for permission to undertake works to complete a Deep Water Quay development at Ros an Mhíl Fishery Harbour Centre, Ros an Mhíl, Co. Galway.

This Construction Environmental Management Plan (CEMP) has been prepared by Malachy Walsh and Partners (MWP) to support the application.

1.1 Construction Environmental Management Plan (CEMP) Purpose and Objectives

The purpose of this CEMP is to outline how the Contractor(s) will implement a Site Construction Management System to meet the specified requirements which include contractual, regulatory and statutory requirements, environmental mitigation measures and planning conditions.

In essence this CEMP is to provide the Developer and the Main Project Contractor with a practical guide to ensure compliance by all parties with Planning and Environmental requirements. The contractor will be contractually obliged to comply with all measures contained in the CEMP.

The CEMP achieves this by providing the environmental management framework to be adhered to during the pre-commencement and construction phases of Ros an Mhíl Deep Water Quay. It outlines the work practices, construction management procedures, management responsibilities, mitigation measures and monitoring proposals that are required to be adhered to in order to construct the works in an appropriate manner and comply with the environmental commitments outlined in the EIAR.

All site personnel will be required to be familiar with the plan's requirements as related to their role on site. There will be a requirement on the Appointed Contractor that details are updated with progress, including the roles and responsibilities of those appointed on the site for the construction of the project.

This CEMP is intended to be a 'live' document whereby different stages will be completed and submitted as the development progresses. In the event planning permission is granted for the development, the CEMP will be updated prior to the commencement of the development, to address the requirements of any relevant planning conditions, including any additional mitigation measures which are conditioned and will be submitted to the Planning Authority for written approval.

1.2 Scope

The CEMP defines the approach to environmental management at the site during the construction phase. Compliance with the CEMP, the procedures, work practices and controls will be mandatory and must be adhered to by all personnel and contractors employed on the construction phase of the project.

This CEMP seeks to:

- Promote best environmental on-site practices for the duration of the construction phase.
- Comply with any planning conditions that may apply.

1.3 Live Document

The CEMP is considered a 'live' document, and as such, will be reviewed on a regular basis. Updates to the CEMP may be necessary due to any changes in environmental management practices and/or contractors but will implement the measures in this version of the CEMP as a minimum. As explained in more detail in the later sections, the procedures agreed in this CEMP will be audited regularly throughout the construction phase to ensure compliance.

2. Overview of project

2.1 Application Site

The Application Site is within Ros an Mhíl Fishery Harbour Centre located on the north-east shore of Cashla Bay near the village of Ros an Mhíl in Connemara approximately 40 kilometres to the west of Galway city. The lands for the application are located entirely within the functional area of Galway County Council (the "Council") and/or the nearshore area of the Council, to the extent relevant as a coastal planning authority. Part of the development is located in the nearshore area of the maritime area, being seaward of the high-water mark of ordinary or medium tides, and within three nautical miles from shore.

During the proposed construction period, the Ros an Mhíl Deep Water Quay development construction site access would include an access at the northeast of the site, adjacent to the construction site compound, and an access at the southern end of the site. The construction site compound would include temporary site offices, staff welfare facilities, staff car parking, and lay down areas.

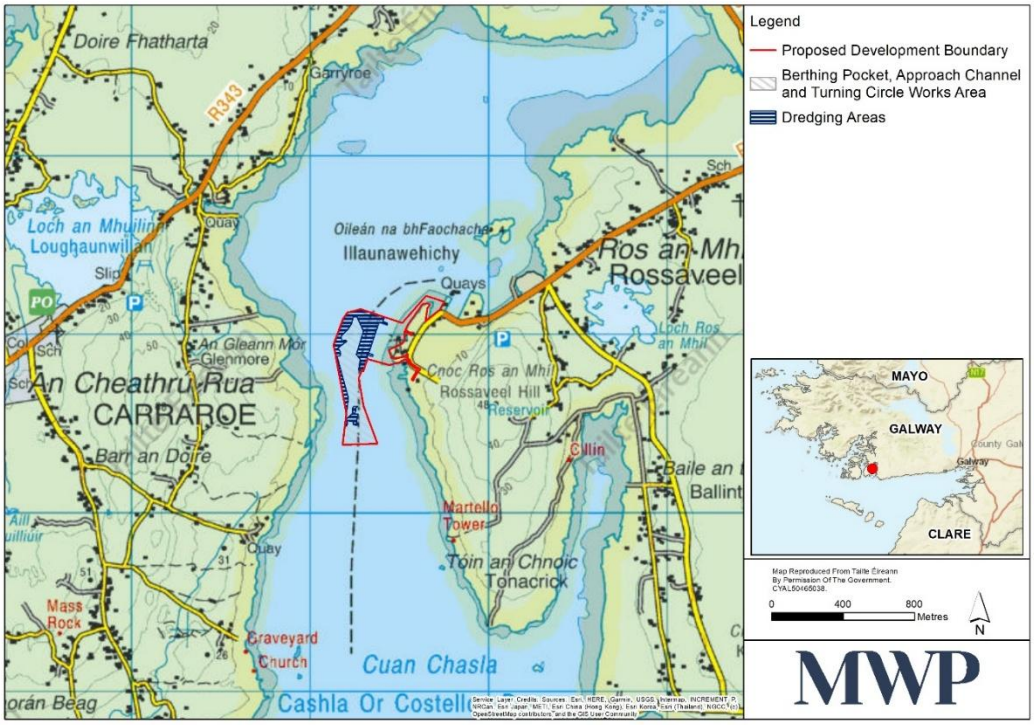

Figure 1: Site Location

2.2 Summary of Proposed Works

The proposed Deep Water Quay Development will include the following main construction elements:

1. works to complete a Deep Water Quay development as previously permitted by Galway County Council under Planning Ref 17/967 comprising
    a. completion of a 200m Quay wall construction using precast beams, precast caissons and precast L-wall units to full height of the quay wall;
    b. Dredging of a 30m wide x 200m long berthing pocket adjacent to the new quay to a depth of -10.0m CD (previously permitted to -12.0m CD);
    c. Dredging for a turning circle of 150m diameter (previously permitted at 200m diameter) to a depth of -7.0m CD (previously permitted to -8.0m CD);
    d. Backfilling behind the quay wall and raising ground level of reclaimed lands using rockfill up to +7mCD;
    e. Reinforced concrete deck behind the quay wall;
    f. Surfacing of the reclaimed lands;
    g. Asphalt roadway connecting the concrete apron at the quayside to the existing road;
    h. Install lighting columns, underground ducts, surface water drainage, outfalls, interceptor, foul water drainage system including pumping station;
    i. Placement of rock armour for revetments along northern and southern extent of reclaimed land;
    j. Excavation by dredging and rock blasting (if required) of the navigation channel to provide for a fully dredged navigation channel of -7m CD and minimum width of 100m (previously permitted to -8.0m CD and minimum width of 74m);
    k. A temporary site compound for contractor personnel including an effluent holding tank;
    l. A temporary concrete batching plant to provide on-site concrete for the quay wall construction;
    m. Install palisade fencing, roadside guard rails, gates and traffic barrier around land boundary of quay area; and
2. Further development comprising:
    a. A wastewater pipeline to connect proposed wastewater discharge points along the proposed quay to a new pumping station for onward discharge to an Údarás na Gaeltachta wastewater treatment plant at Ros an Mhíl; and
    b. A new ESB electrical sub-station for dedicated power provision to the new deep-water quay

2.3 Proposed Programme Duration

There duration of the proposed development is anticipated to be 24 months, with some of this time allocated for procurement.

2.4 Working Hours

Normal working hours during the construction period would be Monday to Friday 7.00 a.m. to 7.00 p.m. and Saturday 7.00 a.m. to 2.00 p.m. All personnel would arrive on site for 7.00 a.m., prior to the morning peak traffic hour; and some personnel would depart from site prior to 7.00 p.m. including during the evening peak traffic hour.

2.5 Methodology

The proposed works can be divided into four key elements as follows:

- Element 1: Quay Wall Construction
- Element 2: Dredging and Marine Works
- Element 3: Land Reclamation and Access
- Element 4: Ancillary Infrastructure (temporary site compound, wastewater pipeline and ESB electrical substation).

Refer to EIAR Volume II, Chapter 2 Project Description for detailed Project Methodology.

2.6 Temporary Construction Compound

A temporary contractors compound will be located in the northern corner of the proposed project site adjacent to the existing Ros an Mhíl harbour facilities in a surfaced area previously used for parking. This compound will include temporary site offices (Portacabins), staff welfare facilities and car parking, and equipment lay down areas.

Office compound welfare facilities will be connected to a waste-water holding tank installed for the duration of the construction works and removed thereafter. The waste water holding tank will be emptied as required and effluent disposed of at a municipal Wastewater Treatment Plant (WWTP).

Figure 2: Layout for the Construction Compound Facilities at the northern end of the proposed development site.

3. Management Organisational Structure and Responsibilities

3.1 Organisational Structure

An example of an Organisational Structure for the Contractor's Project Team is included below. This structure will be defined by the Contractor and will include the names of the assigned personnel with the appropriate responsibility and reporting structure reflected.

The appointed Contractor will be required to finalise the Organisational Structure for the project to oversee this CEMP and to outline the specific responsibilities for the roles required. An example organisation structure is illustrated in Figure 3.

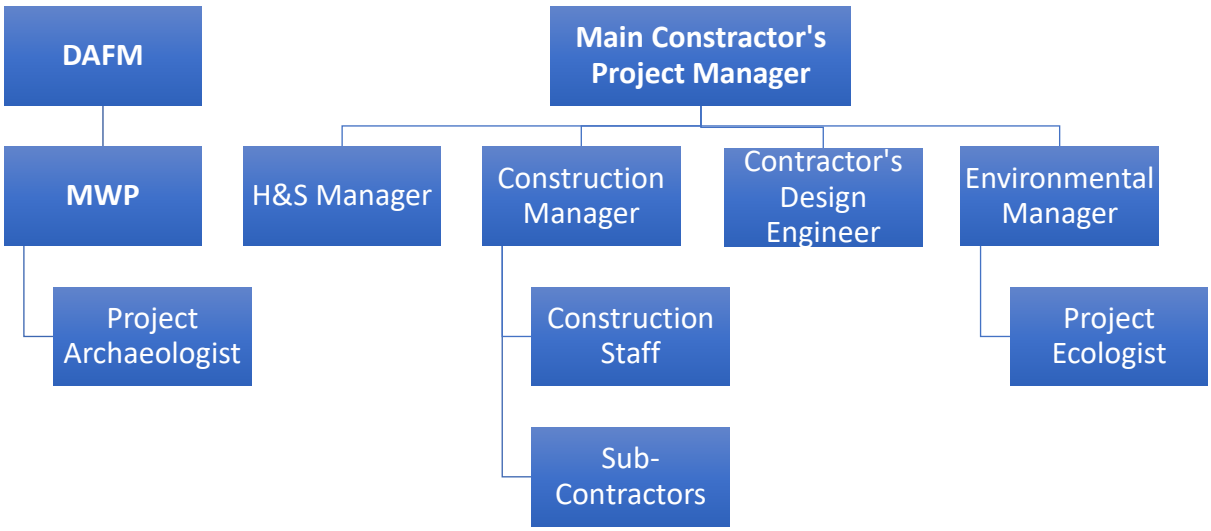

Figure 3: Sample Organisation Structure

3.2 Responsibilities

The general role of key people on site implementing the CEMP will be:

- The Project Manager - liaises with the Project Team in assigning duties and responsibilities in relation to the CEMP to individual members of the main contractor's project team.
- The Construction Manager - liaises with the Environmental Manager when preparing site works where there is a risk of environmental damage and manages the construction personnel and general works.
- The Design Engineer - undertakes and certifies the Design and supervises the standard of works for the contractor. In this case the role of the design engineer will be undertaken by MWP.
- The Environmental Manager - ensures that the CEMP is developed, implemented and maintained. The Environmental Manager will have the authority to review method statements, oversee works and

instruct action, as appropriate, including the authority to require the temporary cessation of works, where necessary. The Environmental Manager would report to the Employers Representative.

Other roles may be outlined as follows;

- Health and Safety (report to the project manager).
- Marine Mammal Observer (report to the Environmental Manager).
- Project Archaeologist (report to the Environmental Manager).
- Geotechnical Engineer (as required by Design Engineer).

The roles and responsibilities outlined above are indicative and will be updated on the appointment of the main contractor (Contractor). Details of the personnel and their responsibilities must be added to the CEMP.

It should be noted that the works are designed by the DAFM, through MWP. The works will have been designed in such a way as to minimise environmental impacts. How this is to be achieved has been detailed in the Natura Impact Statement, EIAR, and other documents which make up the Ros an Mhíl deep water quay planning application. The findings and recommendations of these documents have been used to develop this CEMP. This CEMP will be updated by the appointed construction contractor to specify materials and equipment to be used and operations to be undertaken by the contractor in the construction of the works. Any conditions attached to the grant of planning permission will also be included in the final CEMP.

There will be a resident engineers team working under the direction of the Employer's Representative to ensure that the works are constructed in accordance with the CEMP. From time to time the assistance of an Environmental Manager may be required in the supervision of the works. They will work with the resident engineers team.

4. Environmental Commitments and Best Practice Measures

The Environmental Commitments and Best Practices Measures to be implemented during the construction phase are outlined in the following sections.

Once appointed, it will be the Contractor's responsibility, to update and add (where required) project specific control measures relevant to the environmental management plans and procedures. The Contractor will ensure that plans/procedures are communicated to all site staff, including sub-contractors, through induction, training and at relevant meetings.

Table 4-1 is an outline of the typical environmental management procedures and details are outlined in the sections to follow.

Table 4-1: Environmental Management Plans

Ref:	Procedure: -
EMP-1	Waste Management
EMP-2	Fuel and Oil Management
EMP-3	Concrete Management

Ref:	Procedure: -
EMP-4	Air Pollution Control
EMP-5	Noise and Vibration
EMP-6	Biodiversity Management
EMP-7	Water Management
EMP-8	Marine Management
EMP-9	Heritage Management
EMP-10	Site Environmental Training and Awareness
EMP - 11	Minimizing the Risk of Accidents
EMP-12	Environmental Emergency Response
EMP-13	Environmental Monitoring Schedule

4.1 EMP 1 – Waste Management

The Construction Contractor must develop and submit a Resource Waste Management Plan (RWMP) for approval by the relevant authorities in compliance with Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects published by the Department of the Environment, Community and Local Government 2021. The RWMP must detail measures to minimise waste generation and provide details of the specific waste expected to be generated, measures to separate and store wastes on site, and provide details of the proposed waste contractors and destinations for each waste stream.

All measures included in the RWMP, should be adhered to ensure effective waste management and minimisation, reuse, recycling and disposal of waste material generated during the construction phase of the proposed development. General waste measures identified in the EIAR include the following:

- Construction materials and wastes are to be kept in designated areas to reduce risk of accidental injury/entrapment of any wildlife on-site.
- Portable chemical toilets will be provided for the duration of the works and all waste material will be removed from site and disposed of to an appropriately licensed facility;
- Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the site for disposal or recycling;
- Vehicles exiting the site will make use of a wheel wash facility where appropriate, prior to entering onto public roads, to ensure mud and other wastes are not tracked onto public roads;
- A suitably competent contractor will be appointed who will undertake waste audits detailing resource recovery best practice and identify materials can be reused/recycled;
- Materials will be reused on site within the new build areas where possible;

- Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site;
- Waste audits will be undertaken that will detail resource recovery best practice and identify materials that can be reused and recycled. Materials will be reused on-site within the areas where possible.
- Sourcing materials locally where possible to reduce transport related CO_2 emissions.

Responsibility

The Environmental Manager will be responsible for creating and updating the RWMP. They will also identify a waste contractor to remove waste that can be recycled or re-used.

The Environmental Manager should keep records provided by waste contractors of all waste being removed from site. The Environmental Manager should record waste removed from site regularly. This information should be recorded in a standard format.

It will be the construction manager's responsibility to organise the removal of skips from their area when they are full.

Regard should be had for the Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects (DoEHLG, July 2006) in preparing and maintaining this plan.

4.2 EMP 2 – Fuel and Oil Management

Machinery and Equipment

- Where refuelling is to take place on site it will be within a designated impermeable, bunded area, away from all drains. In the event of a machine requiring refuelling outside of this area, fuel will be transported in a mobile double skinned tank. An adequate supply of spill kits and hydrocarbon adsorbent packs will be stored in this area. All relevant personnel will be fully trained in the use of this equipment. Guidelines such as 'Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors' (CIRIA C532, 2001) will be referred to;
- Drip trays will be used where hydrocarbons are being used for vehicle maintenance/refuelling;
- Suitable chemical and fuel storage shall be provided;
- Spill kits will be located around the site;
- Fuels and oils will be bunded to 110% capacity containers of storage tanks;
- Refuelling of vehicles and machinery will be in designated areas away from watercourses;
- Biodegradable oil to be used in site plant;
- Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the site for disposal or recycling;
- Fuel that requires transportation shall be done so in a mobile double skinned tank;
- Spill trays will be used when refuelling if the fuelling is taking place outside a compound area.

Marine Pollution Control

There is potential for accidental spills or leaks of fuels, oils, or hydraulic fluids from construction equipment operating near or on the water. Such events, though unlikely if managed properly, could cause localised contamination and acute toxicity to marine organisms.

To mitigate these risks, best-practice construction environmental management must be maintained. Key measures include bunded fuel storage, spill kits, and regular equipment checks to prevent hydrocarbon leaks and timing in-water works outside biologically sensitive periods, where possible. With these controls in place, the residual impact to marine ecology is predicted to be low, temporary, and localised.

Responsibilities

The Construction Manager and Environmental Manager are responsible for ensuring Fuel and Oils are managed in line with this procedure. The Appointed Contractor, in updating the CEMP, must designate personnel to the tasks relating to Fuels and Oil.

4.3 EMP 3 – Concrete Management

Concrete Pours/ Use of Concrete

- Run-off and wash down water from exposed aggregate surfaces, cast in place concrete and from concrete trucks shall be trapped on-site to allow sediment to settle out and reach neutral pH;
- The replacement, where feasible, of concrete containing Portland cement with a low carbon concrete as per the Climate Action Plan;
- Concrete pumps on site: all end of pump hoses will be secured with ropes;
- Concrete skips on site: the Delivery chute will be securely fastened using a lock chain or similar control measures to prevent any accidental spills; and
- At the loading points of the concrete skips / pumps, there will be control measures in place to prevent concrete spilling from trucks and contaminating the ground and leaching into the water adjacent.

Concrete Washout

- Temporary concrete wash out areas will be located away from watercourses and the sea.
- Designated washout will be in the form of polythene lined skips or polythene lined washout pits;

Responsibility

The site engineer and the Environmental Clerk of Works will supervise all concrete pours and the dredging, treatment and placement processes.

The Environmental Clerk of Works is responsible for ensuring that appropriate water pollution prevention measures are put in place and that water sampling is carried out. Where standards are breached he/she should carry out an investigation and in conjunction with the Construction Manager, he/she should ensure remedial action is taken and further samples taken to verify that the situation has returned to normal. The Environmental Clerk of Works will also be responsible for ensuring spill kits are readily available in vulnerable locations and that booms for watercourses are long enough and have adequate anchorage.

4.4 EMP 4 – Air Pollution Control

The main types of air pollution that will result from the works are dust and exhaust emissions from combustion engines, and plant machinery and vehicles. Activities with the potential to produce to dust are:

- Plant and vehicle movement.
- Bulk materials handling.
- Stockpiles.
- Vehicle movement off site.

Dust Minimisation Plan

A Dust Minimisation Plan will be prepared for the construction phase of the proposed deep water quay as construction activities are likely to generate some dust. The Plan will include the following dust related mitigation measures:

- Site roads will be regularly cleaned and maintained as appropriate. Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic only. Furthermore, any road that has the potential to give rise to fugitive dust must be regularly watered, as appropriate, during dry and/or windy conditions;
- Vehicles using site roads will have their speeds restricted where there is a potential for dust generation;
- Vehicles delivering material with dust potential to an off-site location will be enclosed or covered with tarpaulin at all times to restrict the escape of dust;
- Vehicles exiting the site will make use of a wheel wash facility where appropriate, prior to entering onto public roads, to ensure mud and other wastes are not tracked onto public roads;
- Public roads outside the site will be regularly inspected for cleanliness, and cleaned as necessary. Before entrance onto public roads, trucks will be adequately inspected to ensure no potential for dust emissions.
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind;
- Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods;
- At all times, the procedures put in place will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, appropriate measures will be implemented to rectify the problem; and
- The Dust Minimisation Plan will be reviewed at regular intervals during the construction phase to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust through the use of best practice and procedures.

Odour Pollution Control

The CEMP will also include an Odour Management Plan to mitigate the potential for odours from dredging operations. This Plan will utilise the guidance 'Environmental Protection Agency Odour Emissions Guidance Note AG9, 2019'. In particular the measures implemented will include:

- Employ appropriate methods, including monitoring and contingencies, to control and minimise odour pollution;
- Prevent unacceptable odour pollution at all times; and
- Reduce the risk of odour releasing incidents or accidents by anticipating them and planning accordingly.

The Plan will also include for periodic odour surveys at nearby sensitive receptors during dredging activities by a suitably qualified expert. The frequency of this monitoring will be agreed as part of the overall implementation of the CEMP with Galway County Council.

Traffic Emissions

The air quality effects from construction traffic are not considered to be significant. However, the following good practice mitigation will be employed

- Implementation of a Traffic Management Plan which will be prepared in advance of the construction works and which will form part of the specification for the construction works. This will outline measures to minimise congestion and queuing, reduce distances of deliveries and eliminate unnecessary loads;
- Turning off vehicular engines when not in use. This restriction will be enforced strictly unless the idle function is necessary for security or functionality reasons; and
- Regular maintenance of plant and equipment. Technical inspection of vehicles to ensure they will perform the most efficiently.

Greenhouse Gas Emissions

The IEMA GHG Management Hierarchy (IEMA 2020b) will be followed for effect minimisation. The Hierarchy is as follows:

- First Eliminate
    - Influence business decisions/use to prevent GHG emissions across the lifecycle
    - Potential exists when organisations change, expand, rationalise or move business
    - Transition to new business model, alternative operation or new product/service
- Then Reduce
    - Real and relative (per unit) reductions in carbon and energy
    - Efficiency in operations, processes, fleet and energy management
    - Optimise approaches (e.g. technology) and digital as enablers
- If you can't eliminate or reduce, then Substitute
    - Adopt renewables/low-carbon technologies (on site, transport etc)
    - Reduce carbon (GHG) intensity of energy use and of energy purchased
    - Purchase inputs and services with lower embodied/embedded emissions
- The final option is to Compensate
    - Compensate 'unavoidable' residual emissions (removals, offsets etc)
    - Investigate land management, value chain, asset sharing, carbon credits

- Support climate action and developing markets (beyond carbon neutral)

Embodied carbon of materials and construction activities will be the primary source of climate effects during the construction phase. The design of the deep water quay, including the re-use of all of the dredged material will minimise the use of high embedded energy materials during construction. This will ensure that the release of greenhouse gases associated with alternative construction methods, for example exporting all of the dredge material off site or importing all of the fill material required for construction of the caisson units, will be avoided.

Measures to reduce the embodied carbon of the construction works will be implemented as follows:

- A construction programme will be created to allow for sufficient time to determine reuse and recycling opportunities;
- Alignment with requirements under the Local and National Climate Action Plan;
- The replacement, where feasible, of concrete containing Portland cement with a low carbon concrete as per the Climate Action Plan;
- The IEMA mitigation hierarchy will be followed (see Greenhouse Gas Emissions EMP 4);
- A suitably competent contractor will be appointed who will undertake waste audits detailing resource recovery best practice and identify materials can be reused/recycled;
- Materials will be reused on site within the new build areas where possible;
- Prevention of on-site or delivery vehicles from leaving engines idling, even over short periods;
- All plant and machinery will be well maintained and inspected regularly;
- Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site;
- Waste audits will be undertaken that will detail resource recovery best practice and identify materials that can be reused and recycled. Materials will be reused on-site within the areas where possible.
- Sourcing materials locally where possible to reduce transport related CO_2 emissions.

Responsibility

The Environmental Manager is responsible for developing and reviewing the site Dust Minimisation and Odour Plans. The Construction Manager is responsible for organising dust suppression.

4.5 EMP 5 – Noise and Vibration

The following measures are recommended to prevent significant effects:

Machinery and Equipment

- Unnecessary revving of engines will be avoided, and equipment will be switched off when not in use;
- Plant and vehicles will be sequentially started up rather than all together;
- Use of effective exhaust silence systems or acoustic engine covers as appropriate;
- Plant will always be used in accordance with manufacturer's instructions. Care will be taken to site equipment away from noise sensitive areas. Where possible, loading and unloading will also be carried out away from such areas;
- Regular and effective maintenance by trained personnel will be undertaken to keep plant and equipment working to manufacturers specification;

Screening and Barriers

- Screening e.g. noise barriers and bunds will be used as appropriate;
- Vibration barriers can provide limited attenuation and will be used as appropriate;

Receptors

- Procedures for handling noise and vibration complaints;
- Internal haul routes will be kept well maintained;
- Advance notification of at least 24 hours to all sensitive receptors during critical phases of construction and during blasting events; and
- Blasting will be limited to daytime works only.

Vibration Measures

In the instance of vibration levels giving rise to what could be deemed as human discomfort, the following measures shall be applied during any further work phases.

- Restriction of works which have a potential to cause significant vibration effects with respect to human response to allocated time periods as noted in planning guidance;
- Appropriate mitigation measures applied to all activities in respect to vibration;
- A coordinated communication programme to inform occupants of the buildings and visitors to the port area informing the likelihood of potential vibration impacts from activities being generated on site. (by means of signage or alert notifications on residential alert platforms, local press, SMS notification).

Responsibility

The Environmental Manager is responsible for developing and reviewing the site Noise and Vibration Control Plan. The Construction Manager is responsible for organising and operating the plan.

4.6 EMP 6 – Biodiversity Management Plan

Project Environmental Manager

A suitably qualified and experienced Environmental Manager will be employed during the construction phase of the project. Duties will include the review of all method statements, delivery of toolbox talks, arranging all required pre-construction surveys for protected species and monitoring of works throughout the construction phase to ensure that works are taking place in compliance with the Conditions of Planning and all environmental controls and EIAR mitigation is implemented in full. As part of toolbox talks, contractor staff and other site personnel, as relevant, will be made aware of the procedure to follow if a protected species or their resting or breeding site is encountered.

The appointed Environmental Officer will be awarded a level of authority and will be allowed to stop construction activity if there is potential for adverse environmental effects other than those predicted and mitigated for in the EIAR. The appointed Environmental Manager will have demonstrated professional experience in managing large-scale construction works affecting ecological receptors identified within the EIAR.

Bio-security

The following measures are recommended in relation to Site bio-security and reducing the risk of introduction or spread of invasive species within the area.

- Prior to being brought to Site, validation should be provided by all suppliers that construction plant, machinery and vehicles are free from invasive species. Similarly, certification is to be obtained from suppliers that all raw materials to be imported to Site including soil, fill, sand, gravel and landscaping materials are free from invasive species.
- All vehicles, machinery and equipment/tools are to arrive to site clean, and steam washed. Visual inspections are to take place. All Personal Protective Equipment (PPE) brought to site is to be clean and dry with any attached vegetation or debris removed.
- A schedule of regular site inspections for invasive species is to be prepared and undertaken for the duration of the construction works. These inspections are to encompass the IAPS growing season for the duration of the construction works programme to monitor existing IAPS growth, identify any new IAPS stands, inspect materials storage areas and monitor implementation of IAPS management measures on-site, where required e.g., fencing, signage etc.
- Where there is a requirement for IAPS control areas, all vehicles, equipment/tools, footwear etc used in these areas will be thoroughly cleaned in a designated area once works in that area are complete to prevent spread of invasive alien plant species (IAPS). The use of tracked machinery within IAPS infested areas is to be prohibited. The use of tracked machinery within close proximity of IAPS infested areas is to be strictly controlled. This should be undertaken with direction from the Environmental Manager.

Management of Invasive Alien Plant Species (IAPS)

- The extents of IAPS infestations on-site are extremely limited and localised. A pre-construction survey for IAPS is to take place in advance of the commencement of site works to inspect existing stands of IAPS for new growth and identify any new stands which may have emerged in the intervening period.
- A construction-stage IAPS management plan will be prepared and will incorporate the following management measures. The construction stage management plan should set out clear processes for the eradication, control and containment of each IAPS on-site and is to include a detailed implementation and treatment schedule (including initial and follow-up treatments) in light of the construction schedule and the prevailing IAPS conditions on-site at the time.
- Where any IAPS is identified within/adjacent to the works footprint, fencing and/or advisory signage is to be erected around stands (minimum 7 m buffer in the case of Japanese knotweed, if encountered).
- No non-essential ground maintenance or any other ground disturbance should take place within IAPS fenced areas. Where works are required within/adjacent to infested areas, the appointed contractor is to develop and implement an appropriate method statement with regard to managing IAPS on-site and ensuring bio-security compliance. This should be done in consultation with a suitably qualified specialist. Under no circumstances is any IAPS plant or rhizome material to be cut, dug out or in any other way disturbed without the advice of a suitably qualified specialist.
- Where application of herbicides is required to treat IAPS on-site, the proximity of ecological receptors is to be taken into account. Herbicide use is to be minimised as much as possible and targeted to the specific IAPS. Where use of herbicides is required, non-residual, aquatic approved herbicides are to be used. Herbicides are not to be used in windy or foggy weather, during or preceding rainfall or where rainfall is forecast within 12 hours or during particularly cold weather to reduce risk of spray drift, run-

off or poor plant uptake. Herbicides are to be applied strictly in accordance with the manufacturer's recommendations and by competent, experienced and licenced personnel registered as a Professional Pesticides User.

- Monitoring of control measures should be undertaken approximately six to eight weeks after treatment to determine success of measures used.
- Large areas of disturbed/bare soil should be mulched, where appropriate, and seeded/planted at the earliest opportunity with native species to stabilise the soil and deter any subsequent reinvasion. Planting should be carried out with regard to '*Horticulture Code of Good Practice: To prevent the introduction and spread of invasive non-native species* (Kelly, 2012).
- Where off-site removal of IAPS material or infested soil is required, then the relevant NPWS licence will be required to be procured in advance of removal of IAPS material off-site and in accordance with the European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477). Off-site removal of such material will be undertaken in accordance with licence conditions.
- All management and control measures implemented on-site during the construction phase are to be carried out in accordance with best practice guidance as set out in '*The Management of Invasive Alien Plant Species on National Roads (GE-ENV-01104)'* TII (2020), '*The Management of Noxious Weeds and Non-native Invasive Species on National Roads*' NRA (2010), '*Best Practice Management Guidelines Rhododendron Rhododendron ponticum and Cherry Laurel Prunus laurocerasus'* Maguire, *et al*., (2008), '*Best Practice Management Guidelines Japanese Knotweed Fallopia japonica*' Kelly, *et al*., (2015) and '*Managing Japanese Knotweed on Development Sites: the Knotweed Code of Practice*' UK Environment Agency (2006).

General Protection of Habitats

- The area of proposed works will be kept to the minimum necessary to minimise disturbance to habitats and flora. Vegetation removal within the Site is to be minimised and be restricted to those areas of vegetation which have been identified for removal (to be clearly marked by contractor staff prior to removal). Removal of vegetation from anywhere outside of marked areas will not be permitted.
- The footprint of the construction area, site compound and materials storage areas will be clearly marked out prior to commencement of works with reference to design drawings, under the supervision of the project engineer and appointed ecologist, so that it is visible to all contractor staff and machine operators.
- The extent of access for all construction plant and machinery is to be clearly marked out, in particular along the southern boundary of the Site to avoid effects on more sensitive habitat, namely areas of 'Scrub (WS1)', which have been identified along the cliff-top immediately adjacent to the Site boundary. A heavy machinery exclusion zone will be established using temporary stakes and signage, as required, to prevent encroachment by heavy machinery onto this habitat. This will be undertaken in consultation with the appointed Environmental Manager. There shall be no side casting of material or any other construction-related activity within this area. All operatives will be made aware of this works exclusion zone.
- All operatives will be made aware of the immediate proximity of Cashla Bay to the Site as part of toolbox talks.

General Protection of Fauna

- Disturbance of fauna generally will be reduced by controlling the movement of construction vehicles and personnel.
- Construction materials and wastes are to be kept in designated areas to reduce risk of accidental injury/entrapment of any wildlife on-site.
- In accordance with Section 40 of the Wildlife Acts, vegetation removal, including tree removal, will be conducted outside of the restricted bird nesting period (March 1st to 31st August, inclusive). This will not only protect nesting birds, but a range of biodiversity.
- Mammals and birds are mobile and so are expected to disperse from the area; however, young or hibernating animals are vulnerable to impacts during vegetation clearance. Prior to any vegetation clearance, the area will be checked by the Environmental Manager to check for the presence of young or hibernating animals.
- Should any resting or breeding place of any protected species be discovered within the Site during the pre-construction or construction phases, the Environmental Manager is to be informed immediately, and the advice of NPWS sought. Any works in the area are to cease immediately, and the area is to be cordoned off until the Environmental Manager has authorised recommencement of works.
- All temporary construction lighting is to be switched off outside daylight hours. Construction lighting is to be directed inwards into the Site to reduce indirect alteration of adjacent habitats outside the site and minimise nocturnal effects on faunal species.
- To reduce the level of night-time disturbance to nocturnal fauna, construction activities should be restricted to standard construction hours. Construction work will not take place outside of these hours unless in exceptional circumstances.

Protection of Birds

Pre-construction Surveys

A pre-construction survey of the Site for ground nests will be conducted by a suitably qualified ecologist in advance of any works to identify any breeding sites along the shoreline. In the event that any bird nesting sites are identified, best-practice mitigation will be recommended by the appointed ecologist in consultation with the Planning Authority/NPWS.

Recommended Timing of Works

It is recommended that, if possible, works are conducted in early autumn or late spring to avoid the main breeding and wintering periods for bird activity. Pushing out works to later in the breeding season will reduce the likelihood of an overlap between construction activity and breeding activity. Typically, this would be from April to July. The summer season had more sightings of waders and other waterbirds compared to the winter season hence it is important to not schedule construction during peak breeding periods.

Protection of Otter

A pre-construction survey for otter should be undertaken by a suitably qualified ecologist prior to the commencement of any works as per best-practice guidance set out in NRA (2008) in relation to construction works and otter. The purpose of the pre-construction survey is to identify any changes within the Site. The survey

should be undertaken no more than 10-12 months in advance of construction. The survey should be supplemented by an additional survey immediately prior to site works commencing if more than four weeks have elapsed since the initial pre-construction survey.

In the event of an otter breeding/resting place being discovered within or in proximity of the Site, all construction activity and site works will be undertaken in accordance with NRA (2008). Implementation of best-practice guidelines for otter will be overseen by the appointed Environmental Manager.

Marine Mammals

Marine mammal construction management measures are detailed in Sec 4.8, EMP 8 – Marine Management

Atlantic Salmon and Sea Trout

Atlantic Salmon and Sea Trout construction management measures are detailed in Sec 4.8, EMP 8 – Marine Management.

Invasive (Marine) Alien Species

Invasive Marine Alien Species construction management measures are detailed in Sec 4.8, EMP 8 – Marine Management.

Responsibilities

The Environmental Manager is responsible for developing and reviewing the site Biodiversity Management Plan. The Construction Manager is responsible for organising and operating the plan.

4.7 EMP 7 – Water Management Plan

Purpose

The purpose of this plan is to describe the measures that will be taken to mitigate the potential impacts that may occur as a result of the proposed development at Ros An Mhíl on water quality. This is particularly important given the nature of the proposed development and its proximity to Cashla Bay and Galway Bay.

Procedure

The following mitigation measures adhere to best practice and will allow the proposed development to be completed:

- Suitable chemical and fuel storage shall be provided;
- Spill kits will be located around the site;
- Fuels and oils will be bunded to 110% capacity containers of storage tanks;
- Refuelling of vehicles and machinery will be in designated areas away from watercourses;
- Biodegradable oil to be used in site plant;
- Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the site for disposal or recycling;
- Fuel that requires transportation shall be done so in a mobile double skinned tank;
- Spill trays will be used when refuelling if the fuelling is taking place outside a compound area;
- Build up at the installed silt fence will be cleared regularly;
- Stockpile areas for materials will be bunded to prevent surface water runoff into the harbour waters;
- Run-off and wash down water from exposed aggregate surfaces, cast in place concrete and from concrete trucks shall be trapped on-site to allow sediment to settle out and reach neutral pH;
- Designated washout will be in the form of polythene lined skips or polythene lined washout pits;

- Washout of concrete trucks will not occur at the site. Washout of plant is to be carried out in designated, contained, impermeable areas. Designated washout will be in the form of polythene lined skips or polythene lined washout pits;
- Monitoring buoys will be deployed for the duration of the works, and are detailed in Section 4.13.1.

The following best practice mitigation measures will be implemented for the management of runoff and sediment control to avoid pollution:

- Erosion control, where runoff is prevented from flowing across exposed ground and becoming polluted, and sediment control, where runoff is slowed to allow suspended sediment to settle, are important elements in runoff and sediment control. Erosion and sediment controls are to be implemented prior to any site clearance works commencing.
- Clean water runoff will be intercepted and diverted away from construction site runoff to avoid cross-contamination of clean water with soiled water.
- The amount of material excavated is to be kept to a minimum. Excavations and filling will only be carried out following installation of appropriate sediment controls measures which will slow run-off and trap suspended sediment, particularly if working during prolonged wet weather or if working during an intense rainfall event.
- The drainage system will be inspected regularly during construction, in particular after heavy rainfall/storm events, to check for blockages/drainage issues. Where any drainage issues are identified, these will be addressed on the same day to ensure water quality protection.

Dredging works are not expected to have any significant negative effects on water quality in the vicinity of the proposed development. The mitigation measures outlined above will be effective in preventing negative effects on water quality for the proposed development.

Although the probability of encountering contaminated material during dredging is low, the subsequent mitigation strategies are specified should such a scenario arise. Potentially contaminated dredge material will be stored in stockpiles within the site itself, and separately from clean dredged material. The stockpiles will be cordoned off and labelled as unusable until such a time as laboratory results are available to determine if the material is suitable for reuse. All equipment will be cleaned down in a designated area prior to leaving the site.

- Dredging vessel will be checked for any fuel/oil leaks on a regular basis by the crew;
- In the event of a major spill due to damage to the dredger, there will be plans to locate and isolate, inform harbour authorities, project manager and environmental agency; and
- The dredger will start at lowest revs of the pump, with pump revs increased over a 15 minute period to allow wildlife an opportunity to move further away from the vessel prior to the pumps reaching full power.
- All plant and machinery on site will be owned and managed by the contractor (In the event of a breakdown or an emergency hired plant and machinery may be required. Same will be inspected ahead of use to ensure suitable)
- Plant and Machinery will be inspected visually daily ahead of works
- Weekly records of inspections will be recorded on GEOPAL GA2 Forms
- The contractor's Fitter for site will carry out regular inspections and servicing on all owned plant and machinery to ensure suitable for use
- Any defects in plant or machinery will be reported.

Responsibility

The Environmental Manager is responsible for ensuring that appropriate water pollution prevention measures are put in place and that water inspection is carried out if required. Where standards are breached and remedial action is taken, an investigation must be carried out in conjunction with the Construction Manager, and further samples must be taken to verify that the situation has returned to normal.

The Environmental Manager is responsible for ensuring spill kits are readily available in vulnerable locations.

The Construction Manager (or a designate) is responsible for ensuring the spill kits are adequately stocked and should inform the Environmental Manager when items have been used.

4.8 EMP 8 – Marine Management

Purpose

The purpose of this plan is to describe the measures that will be taken to mitigate the potential impacts that may occur as a result of the proposed development at Ros an Mhíl on the marine environment. This is particularly important given the nature of the proposed development and its proximity to Cashla Bay and Galway Bay.

Procedure

Pollution Controls – Accidental spills or leaks of fuels or hydraulic fluids could cause localised contamination and acute toxicity to marine organisms. Best practice construction environmental management will be followed, which includes:

- Bunded fuel storage,
- Spill kits,
- Regular equipment checks,
- Timing in-water works outside of biologically sensitive periods.

Marine Mammals

In accordance with the 'Guidance to Manage the Risk to Marine Mammals from Man-made Sounds Sources in Irish Waters' (NPWS, 2014), marine mammal mitigation should be applied for all dredging, drilling and blasting operations. The following mitigation is recommended for the following construction activities:

Dredging

- A dedicated Marine mammal observer (MMO) shall be on site during all dredging operations, including within the protective berm, and for all operations where an excavator bucket is expected to make contact with the seabed or material on the seabed. For all such activities, the following mitigation measures should be implemented;
- A clear line of communication between the MMO and operators will be established;
- All mitigation measures shall be implemented for all species of cetacean, seal, marine turtle, otter and basking shark;
- A 30-minute pre-watch prior to operations shall be undertaken;
- A WMO sea state four or less, 1km or more of visibility beyond the limits of the mitigation zone, and daylight, is required for the MMO to conduct a pre-watch;

- A mitigation zone of 500m radius from the sound source shall be implemented;
- Following the detection of a marine mammal within the mitigation zone during the pre-watch, a delay in commencement of operations shall be adhered to until the animal is visibly observed to have left the mitigation zone, or at least 15 minutes has elapsed since the animal was last detected in the mitigation zone;
- During any breaks in sound of >30 minutes, a full 30-minute pre-watch shall be conducted prior to recommencement of operations.

Drilling

- A dedicated MMO shall be on site during all drilling operations;
- A clear line of communication between the MMO and operators will be established;
- All mitigation measures shall be implemented for all species of cetacean, seal, marine turtle, otter and basking shark;
- A 30-minute pre-watch prior to operations shall be undertaken;
- A WMO sea state four or less, 1km or more of visibility beyond the limits of the mitigation zone, and daylight, is required for the MMO to conduct a pre-watch;
- A mitigation zone of 500m radius from the sound source shall be implemented;
- Following the detection of a marine mammal within the mitigation zone during the pre-watch, a delay in commencement of operations shall be adhered to until the animal is visibly observed to have left the mitigation zone, or at least 15 minutes has elapsed since the animal was last detected in the mitigation zone;
- During any breaks in sound of >30 minutes, a full 30-minute pre-watch shall be conducted prior to recommencement of operations.

Blasting

- A dedicated MMO shall be on site during all blasting operations;
- A clear line of communication between the MMO and operators will be established;
- All mitigation measures shall be implemented for all species of cetacean, seal, marine turtle, otter and basking shark;
- A WMO sea state four or less, 1km or more of visibility beyond the limits of the mitigation zone, and daylight, is required for the MMO to conduct a pre-watch;
- A 30-minute pre-watch prior to operations shall be undertaken. The MMO shall maintain constant surveillance of the mitigation zone from a suitable platform;
- A mitigation zone of 1,000m radius from the sound source shall be implemented;
- Following the detection of a marine mammal within the mitigation zone during the pre-watch, a delay in commencement of operations shall be adhered to until at least 30 minutes elapsed since the animal was last detected in the mitigation zone;
- The time between the end of pre-watch and operations commencing shall be minimised. The MMO shall maintain constant surveillance of the mitigation zone from a suitable platform up until the blast takes place;

- A 30 minute post-blast watch of the mitigation zone shall be undertaken.

Atlantic Salmon and Sea Trout

Specific mitigation is also outlined in relation to Atlantic Salmon and Sea Trout, which includes:

- No blasting shall be conducted between 1st of April and 31st of May, inclusive, as this is the peak time of year when smolts of both species will be transiting through Cashla Bay;
- No blasting shall take place between 1st June and 31st August, inclusive, as this is the peak migration period of returning adults of both species through Cashla Bay.

Invasive Marine Alien Species

The remaining construction works of the deep water quay at Ros an Mhíl presents potential pathways for the introduction and spread of invasive alien species (IAS) in the marine environment. Marine infrastructure developments often act as vectors for IAS through increased vessel traffic, ballast water discharge, and the attachment of non-native organisms to construction materials, equipment, and vessel hulls (Minchin and Nunn, 2013). Quay structures, pontoons, and submerged surfaces can also serve as new hard substrates for colonisation by opportunistic non-native fouling organisms, which may subsequently spread to surrounding natural habitats.

Species of concern in Irish coastal waters include *Didemnum vexillum* (carpet sea squirt), *Crepidula fornicate* (slipper limpet), and *Undaria pinnatifida* (wakame), all of which can outcompete native flora and fauna, alter benthic community structure, and impact commercial aquaculture and fisheries (BIM, 2023). The risk is heightened when construction involves equipment or materials transported from other regions, particularly from areas where IAS are already established.

To minimise the introduction and spread of IAS, a suite of biosecurity measures should be implemented during the construction phase. These include cleaning and inspection of all marine plant, vessels, and construction equipment before deployment on site, sourcing materials such as rock fill from terrestrial, no-marine locations and avoiding material with prior aquatic exposure, ensuring that ballast water management practices comply with IMO Ballast Water Management Convention standards, regular monitoring of new structures for colonisation by non-native species, Development of a Biosecurity Risk Assessment and, if needed, a Rapid Response Plan for any detected IAS.

With proper controls, the likelihood of IAS establishment due to the development is considered low, though continued vigilance during the remainder of the construction phase remains important.

Responsibility

The Environmental Manager is responsible for developing and reviewing the site Biosecurity Control Plan. The Construction Manager is responsible for organising and operating the plan.

4.9 EMP 9 – Heritage Management Plan

This assessment has concluded that there is no risk of negative effects on known archaeological or cultural heritage features from the proposed development. However, a very low possibility remains for the discovery of isolated underwater cultural heritage features or archaeological artefacts within the turning circle and approach channel proposed for dredging. This risk cannot be entirely eliminated.

To address this, the following measures are recommended:

- The developer must comply with the National Monuments Acts 1994–2004 regarding the discovery and reporting of archaeological features or objects.
- The marine archaeological environment should be monitored and managed in line with the requirements of the Underwater Unit of the National Monuments Service during dredging.
- An underwater archaeologist should prepare an Archaeological method statement prior to dredging works. This must be done in consultation with and approved by the Underwater Unit of the National Monuments Service (DAHRRGA).
- This method statement should include (but not be limited to) methodologies, such as restricted areas or buffer zones, for ensuring that the potential cultural heritage features identified outside the development footprint are protected from inadvertent damage from dredging works.

Gaeltacht Cultural Mitigation Measures

Given the location of the proposed development in a Gaeltacht region of County Galway, the following cultural mitigation measures are proposed to support the Irish language:

- All signage will be in Irish. Where bilingual signs are necessary, Irish will be the dominant language.
- When awarding construction contracts, DAFM will seek to ensure that contractors employ Irish-speaking workers from within the Gaeltacht area.
- An Irish-speaking Liaison Officer will be appointed to the project during construction to support communication and cultural integration.

Responsibility

The Environmental Manager is responsible for developing and reviewing the site Heritage Management Plan. The Construction Manager is responsible for organising and operating the plan.

4.10 EMP 10 - Site Environmental Training and Awareness

All construction staff will receive training in all aspects of Environmental Management including:

- Working adjacent to water
- Chemical Management on site
- Fuel Management on site
- Refuelling procedures
- Spill procures
- Habitat protection
- Used of concrete on site and correct concrete washout procedures on site
- House keeping
- Waste Management
- Noise and vibration Management
- Dust management on site
- Traffic management

This will be done through:

- Ensuring that Environmental Induction Training is carried out for all site personnel.
- The induction training may be carried out in conjunction with Safety Induction Training,
- Providing toolbox talks on Environmental Control Measures associated with Site-specific Method Statements to those who will undertake the work.

Responsibility

The Site Environmental Manager will be responsible for ensuring all staff receive adequate environmental training.

4.11 EMP 11 - Minimizing Risks of Accidents

The area of the proposed development remains in an area designated as Flood Zone A with the highest probability of flooding. This means there is a greater than 1-in-200 chance of coastal flooding occurring at the project site. The design of the new deep water quay considers this high risk of flooding and proposes to raise the ground level behind the quay wall to a level of +7m Chart Datum (CD), which is above the suggested +6.7mCD in the Flood Risk Assessment (FRA) carried out in 2016 (Appendix 7A).

Flooding can affect the safety of construction staff and equipment.

Flooding affects water quality in a variety of ways. Flood waters can interact with pollutants and chemicals, such as fuel and oils, that can be brought out to sea when the flood waters recede. The concrete batching plant to be relocated on site could also be affected, with concrete entering the water during a flood event. This can also affect material stockpiles such as gravel, sand and manufactured materials such as piping and steel rebar, displacing it and carrying the material into Cashla Bay when the water levels recede. The flooding could also cause erosion of the environment by disturbing soils and causing sedimentation in the water.

Until such time as the quay wall is completed and the ground level of the reclaimed area behind the quay wall has been raised to +7mCD, the site will remain at risk of occasional coastal flooding during tidal, storm and high rainfall events. To avoid accidents and pollution all construction works should be suspended during severe weather events likely to cause flooding and erosion or pollution.

Best construction practice, including that for Health and Safety, will be employed to minimise the risk of any accidents occurring. All work on site will be carried out in compliance with the Safety, Health and Welfare at Work Act 2005, the Safety, Health and Welfare at Work (Construction) Regulations 2013, and all relevant Legislation and Work Practice to ensure that the construction areas, site environs and public roads remain safe for all users.

Responsibility

The Site Environmental Manager is responsible for monitoring the weather forecasts and weather warnings and managing construction activities to suspend works when needed to avoid any serious risk of accidents, erosion and pollution.

4.12 EMP 12 – Environmental Emergency Response

In the event of an environmental incident, or breach of procedure, or where a complaint is received, the contributing factors are to be investigated and remedial action taken as necessary. The Main Contractor will ensure that the following respond actions will take place:

- The Project Manager must be informed of any incident, breach of procedure and/or complaint received, and details must be recorded in the incident/complaint register.
- The Project Manager is to conduct/co-ordinate an investigation to determine the potential influence that could have led to the non-compliance.
- The Project Manager is to notify and liaise with the appropriate site personnel where required, e.g. Site Environmental Manager, Project Ecologist, Project Archaeologist.
- If necessary, the Project Manager will inform the appropriate regulatory authority. The appropriate regulatory authority will depend on the nature of the incident.
- The details of the incident will be recorded on an Incident / Complaints Form which is to record information such as the cause, extent, actions and remedial measures used following the incident/complaint. The form will also include any recommendations made to avoid reoccurrence of the incident.
- The Project Manager will be responsible for any corrective actions required as a result of the incident e.g. an investigative report, formulation of alternative construction methods or environmental sampling, and will advise the Main Contractor as appropriate.
- The Project Manager is to ensure that the relevant environmental management plans/procedures are revised and updated as necessary.
- A Community Liaison officer will be nominated by the management team and will be responsible for resolving any issues and will follow up complaints made by the general public to ensure they are resolved.

Responsibility

The Environmental Manager is responsible for developing and reviewing the site Environmental Emergency Response Plan. The Construction Manager is responsible for organising and operating the plan.

4.13 EMP 13 – Environmental Monitoring Schedule

The Monitoring Schedule for construction will also provide for the checking of equipment, materials storage and transfer areas and specific environmental controls.

A Preliminary Monitoring Schedule is provided below and will be finalised pending appointment of the Contractor. The Contractor's developed daily Site Checklists must have the following information included at a minimum:

Monitoring and Checking	Frequency	Responsibility
Environmental Inspections	Monthly	Site Managers
Environmental Inspections	Weekly	Environmental Clerk of Works / Environmental Manager

Monitoring and Checking	Frequency	Responsibility
Environmental Audits	Quarterly	Environmental Clerk of Works / Environmental Manager
Surface Water Inspections (recorded)	Continuous & Daily	Environmental Clerk of Works / Environmental Manager
Surface water inspection (visual)	Daily	Contractor
Dust Monitoring (visual)	Daily	Construction Manager
Marine Mammal Observer	Daily during dredging, drilling and blasting	Qualified Marine Mammal Observer
Archaeological Monitoring	During dredging	Qualified maritime archaeologist with underwater/maritime/marine dredging experience
Stabilised dredge material (leachate analysis)	1 sample per 3000 tonnes stabilised material	Environmental Clerk of Works / Environmental Manager
Concrete Pours	As Required	Environmental Clerk of Works / Environmental Manager

The Contractor will assign an on-site Environmental Clerk of Works to monitor the construction activities on a day-to-day basis. The duties will include completing the required checklists and coordinating with the relevant personnel (e.g., Project Ecologist, Project Archaeologist and the Design Engineer as required) ensuring all environmental monitoring is carried out.

- Environmental performance indicators will at a minimum include:
- Number of environmental accidents logged.
- Number of environmental incidents logged.
- Breach of procedure and corrective actions.
- Number of environmental complaints received.
- Results of water quality monitoring.
- Results of dust monitoring.

Responsibility

The Environmental Manager is responsible for monitoring and auditing the works.

4.14 Monitoring and Record Keeping (During Construction)

The contractor will develop a Record Keeping, Auditing and Monitoring Procedure that will provide a list of records to be kept on site along with the procedures to be adopted for each. It will identify a reporting system for any unexpected events or finding, emergency events or breaches of procedure. Depending on the issue, reporting may be required to the client (the Minister for Agriculture, Food and the Marine); the planning authority; NPWS; NMS or others.

A monitoring schedule and reporting procedure will be set out in accordance with detailed requirements of the individual environment monitoring procedures proposed below. It shall provide a comprehensive and complete monitoring programme stating the locations, duration, and frequency for each form of monitoring required. Any equipment required for monitoring shall be in good working order and calibrated as per the manufacturers specifications. Copies of calibration certificates shall be provided. Monitoring schemes identified at the current time and which must be incorporated as a minimum are:

- The Employer will engage a Marine Mammal Observer for the duration of the works in accordance with the contract.
- Archaeological monitoring measures.
- Noise monitoring in the event of any complaints of exceedance of noise limits set out in BS:5228.
- Water quality monitoring during dredging works and during the airlifting works to prepare the base of the caisson structure.

Auditing of records by the client and / or the planning authority as appropriate will be provided for.

4.14.1 Marine Mammal Monitoring

As part of the project requirements, marine mammal observation works for drilling, blasting and dredging operations will be undertaken by the contractor. A team of dedicated, experienced Marine Mammal Observers (MMOs) will be engaged to conduct marine mammal mitigation activities during drilling, blasting and dredging operations for the project. One dedicated, JNCC-certified Marine Mammal Observer (MMO) will be present for drilling, blasting and dredging operations, respectively. The MMO will conduct 30-minute visual pre-work watches during daylight hours for marine mammals prior to the operations, and the MMO observations will be conducted on site from land. The operations will be conducted in accordance with the Department of Arts, Heritage and the Gaeltacht (DAHG) 'Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters' (2014) which outlines industry best practice approaches to mitigate against any possible disturbance to marine mammals. Figure 4-3 shows the proposed MMO locations.

Figure 4: Proposed Marine Mammal Observer Locations.

4.14.2 Water Quality Monitoring

The installed surface water drainage system and inceptors will be monitored for blockages and integrity and maintained to ensure their ongoing optimal effectiveness. The monitoring frequency will be adjusted based on the level of activity and prevailing weather conditions to address the assessed risk. Build up at the installed silt fence will be cleared regularly.

Sensitive receptors, if any, identified during the construction phase will be documented on a site drawing. Where necessary, monitoring will continue throughout the construction phase, with its frequency determined by planned activities, timelines, and the location of sensitive receptors.

Turbidity Monitoring

A compact, durable and lightweight HydroLab MS5 probe containing a self-cleaning turbidity sensor, LDO dissolved oxygen sensor, a temperature sensor and a conductivity sensor will be used to measure turbidity. The probe will be mounted on a moored Toroidal buoy (1350 mm in diameter) with galvanised steel/aluminium superstructure with baffle light fitted with 2 No solar panels and battery box for housing system and battery which will have a telemetry system to relay data to a shore location (see Figure 4-1). Each fixed Probe will relay data on a half-hourly basis back to a terrestrial monitoring station located at Ros an Mhíl Harbour. The monitoring station will include a data logging system with a real-time visual display of the transmitted data.

In order to meet these requirements, two buoys will be deployed at the project site prior to initiations of works and decommissioned on completion of works. The locations are presented in Table 4-2.

Table 4-2: Location of Data Bouy for Surface water monitoring

Reference	Latitude	Longitude
Data Buoy 1	53.2631	-9.568614
Data Buoy 2	53.267281	-9.568247

Figure 5: Buoy being deployed

4.14.3 Noise and Vibration Monitoring

In addition, specific mitigation measures outlined in the NVM Ltd 'Continuous Vibration Monitoring Report, refer to EIAR Vol III Appendix 11D, will also be implemented:

- Noise Monitoring and vibration monitors will be set up and maintained by a competent specialist on site as required (locations to be agreed on site).
- An online portal will be used to record noise and vibration monitoring in real time on site. Trigger limits will be set and an email / text alert system is set up to notify team of any breaches in triggers. Once a limit is trigged work will be stopped and control measures put in place to reduce or remove same.

- A monthly Vibration Monitoring Report will be prepared to identify any exceedances above nominal limit values and attempts to clarify the causes etc. Where remedial measures are required and identifiable these will also be clearly stated.

In order to avoid any potential for cosmetic damage due to the site activities, it is advisable for the contractor to conduct further monitoring at identified sensitive locations to continue the collection of measurement data during the project as a means of mitigation.

As a location of noted heritage, the location of the Martello Tower should be considered as one of the sensitive receptor points. Previous locations of noise monitoring and instrumentation are outlined in Table 4-3.

Table 4-3: Location of Noise monitoring and Instrumentation Details

Location Reference	Description	Instrumental details
V1	Coast Guard Building	Ava Trace M80
V2	Storage Shed (cold store)	Ava Trace M80
V3	Lighthouse Signal building	Ava Trace M80
V4	House at Harbourt car park	Ava Trace M80
V5	Martello Tower	Ava Trace M80

Figure 6: Map of noise monitoring locations.

4.14.4 Archaeological monitoring

An experienced and suitably qualified maritime archaeologist with underwater/maritime/marine dredging experience and licensed under the National Monuments Act 1930-2004, will be engaged and retained for the duration of the relevant works to carry out such archaeological monitoring.

In the event of archaeologically significant features or material being uncovered during the construction phase, there will be plans that machine work will cease in the immediate area to allow the archaeologist/s to inspect any such material; full archaeological recording of significant material will be in accordance with archaeological licence requirements and the Statutory Orders. Provision for secure temporary storage facilities will be made in advance of the Works so as to immediately house any finds recovered during the archaeological monitoring.

4.14.5 Dust monitoring

Abatement measures will be put in place to mitigate against any potential air quality impacts on nearby residents or businesses. The contractor will manage dust on site in the following ways:

- Access roads and compound areas will be kept clean and dust suppression will be put in place in dryer months of the year;
- All waste skips will be covered;
- Approach roads and all associated construction areas will be regularly cleaned and maintained as appropriate;
- Hard surface roads will be swept to remove mud and aggregate materials from their surface;
- An onsite wheel cleaning facility will be provided in the construction compounds to ensure that all vehicles leaving the site do not carry access dirt or material to the public road;
- Dust suppression by water spray on access roads and other areas will be used if dust becomes an issue;
- Use of appropriately covered vehicles for transport of potential dust generating material such as sand;
- Mandatory speed limits will be enforced within the harbour area particularly in weather conditions which are likely to generate dust.

5. Additional Measures

5.1.1 Public Relations

The movement of construction vehicles will be organised to cause minimal disturbance to public use of harbour roads and other areas. The contractors ensured that all householders and businesses along the proposed underground services pipelines are given adequate written notice of any works, any disruption to access to their houses or temporary interference with services as a result of the works shall be notified a minimum of two weeks in advance. The contractor will make themselves available to attend meetings with Local Liaison Committees or groups when requested.

An Environmental Complaints Procedure will be developed and will set out the recording, investigation, rectification and response procedures to be following in the event of any environmental complaints received. These will typically relate to potential noise complaints; traffic related complaints; dust and dirt complaints

6. Summary

This CEMP provides the information which will be incorporated into the final Contractor-developed Plan at the construction stage of the project. The requirement on the Contractor to update these details has been explained, and there is a particular requirement for an update to the roles and responsibilities of those appointed on the site for the construction of the project.