Project:	Port of Cork ORE Enhancement Works						
Client	Port of Cork Company						
Subject	Maritime Usage Licence Application – Proposed Maritime Usage						
Appendix	3.1						
Orig. by	DM	**Appr. by**	AA	**Date**	03/04/2026	**Doc. Ref:**	CORE1-AYE-RE-XX-TN-MA-0211

Proposed Maritime Usage

The proposed marine Site Investigations (SIs) which include geotechnical boreholes and environmental sediment samples, will enable:

- Detailed mapping of nearshore shallow geological and seabed character;
- Reconnaissance level mapping of seabed relief and features (e.g. archaeology);
- Greater understanding of the seabed and sub-seabed conditions;
- Evaluation of the nature and mechanical properties of the superficial seabed sediments along the survey corridor;

The knowledge gained from the proposed SIs will be used to minimise uncertainty in ground conditions at an early design stage.

Data acquired during the proposed SIs will be used to inform the design and assessment of any future projects in the area by providing information on the baseline environment and allowing impacts to be predicted, and subsequently appropriate mitigation to be developed, as applicable. The results of the proposed SIs may also be used at a later date to provide a baseline against which to monitor effects of construction, operation and decommissioning of marine infrastructure.

1 Borehole Investigation

1.1 Structural Boreholes

Structural boreholes were proposed to inform detailed design. Fifteen (15 No.) proposed structural boreholes were considered adequate to inform future design stages. The indicative locations are shown in Figure1 – an extract of drawing CORE1-AYE-RE-XX-DR-MA-0223.

Each borehole will begin as a cable percussive borehole bored to “refusal”. Boreholes in the area typically encounter “refusal” at depths ranging from 0.4m to 12.5m below seabed. Where refusal is encountered, rotary core drilling will follow at the same location. These follow-on boreholes are then generally drilled to a maximum depth of 25m below the seabed or to a depth of -30m CD with a casing diameter of 200mm

The maximum impacted seabed area is 0.5m^2 and the total volume of seabed material extracted is 12m^3.

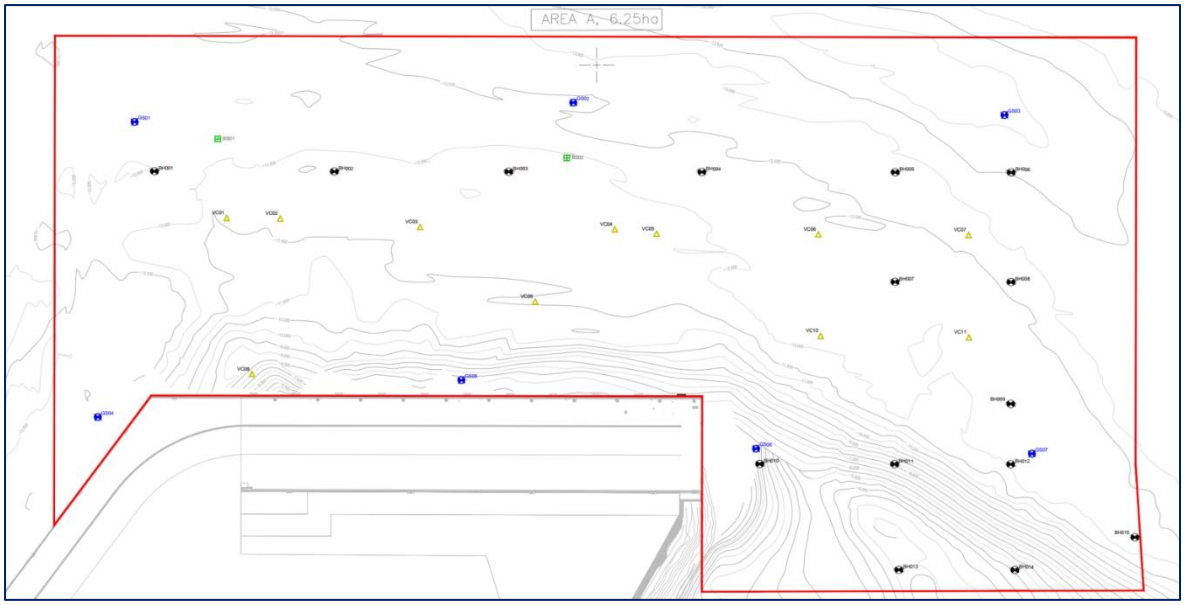

Figure 1: Proposed Site Investigation locations (Extract of CORE1-AYE-RE-XX-DR-MA-0223).

1.2 Sediment Testing Borehole

Sediment samples will be obtained through vibrocore drilling (use of high frequency vibrations to drive a hollow tube into soft unconsolidated sediments) through soft estuarine overburden for recovery of soft soil and sediments. Sediment samples can also be obtained using surface samples (Van Veen grab) as required by the Marine Institute (MI); however vibrocore drilling is more intrusive. In total, 11 vibrocores and 7 surface grab samples will be collected within the dredging area. The sampling plan received from the MI has been included as Appendix A.

The vibrocore machinery to be used is approximately 4.5m tall when it is in transit and approximately 7m tall when the borehole is being driven. The machinery will be supported by a suitable vessel the Dennis Murphy.

For each vibrocore the footprint of the works on the foreshore will be four approximately 1 m^2. legs of the jack-up barge and the 105 mm temporary steel casing. The 106 mm steel casing is the diameter of the borehole. The vibrocore will be drilled up to 6m below the existing seabed.

There will be no permanent structures, all site investigation will be facilitated by temporary works. The moving marine plant will remain on site for the duration of the works. Associated sampling and testing (both in-situ and geotechnical/geo-environmental laboratory testing).

Proposed marine SI works will be conducted entirely from vessels within the marine environment. The waste soil arisings from each borehole will be minimal based on the diameter of the casing and these will be brought on land for disposal at an appropriately licenced facility.

2 Radiological Testing

A sample will be taken within the proposed dredge area for radiological testing. The sample will be 1.5kg in wet weight and stored in a leak proof container clearly labelled with location and sampling date. These will be delivered to the EPA radiation Monitoring Laboratory for testing.

3 Benthic Grab Samples

It is proposed to collect surface subtidal grab samples from 2 locations within the immediate footprint of the proposed development. It is expected that 2 drop down video locations will be surveyed prior to grab sampling to assess the benthic community and determine suitability for grab sampling.

Both subtidal stations will be used within the vicinity of the proposed CORE development area, to collect benthic faunal samples. Additionally, sediment samples will be collected for particle size analysis and organic carbon content. Similar samples (faunal and sediment) will be collected by core along the intertidal transects.

Subtidal sampling will involve the following:

- Single 0.1m^2 grab samples collected at each of the subtidal sampling stations;
- An additional grab will be collected for Grainsize and Loss on Ignition;
- Ancillary information will be recorded on pre-prepared data record sheets;
- Samples will be positioned using the vessel's GPS.
- Sample positions will be recorded when on site;
- Photographs will be taken of each sample; and
- Drop down video footage will be collected from both locations.

Grab samplers are used to recover samples from approximately the top 0.2 - 0.5m of seafloor. These samples may be used to classify the seabed, or for biological analyses. These samples are generally deployed overboard using a crane from a vessel.

There are various grab sampler types to include but not limited to Van Veen, Hamon and Day Grab samplers. Generally, some variants may come either as single or double, and in a variety of different sizes. Grab samplers generally comprise of steel buckets that are deployed open and which trigger shut when the sampler is in contact with the seafloor. As the buckets close, sediment and biological material are retained inside the sampler.

The grab sampler is then recovered to deck and place on a trestle or table. The retained material is then visually inspected for acceptance and then transferred to adequate container or on to a designated mat for further offshore processing and logging.

Single Van Veen Grab is ideal for the collection of sediment samples for biological and environmental sampling. In a range of sizes (0.025m^2, 0.1m^2, 0.2m^2, 0.3m^2) each model has a marine grade stainless steel bucket with hinged access flaps on the top allowing sub sampling of the collected sediment before it is emptied from the grab. The standard for this type of benthic faunal survey is 0.1m^2. The bucket is operated with a pair of stainless-steel lever arms that increase the tension to secure the sample securely in the grab as it is retrieved to the surface. Additional lead weights can be added to the back of the bucket to improve stability in strong currents and to the lever arms to increase the equipment's ability to perform in harder conditions.

Generally, any grab sampling will be carried out by deploying sampling gear from the vessel, as per standard operation procedure for deck works involving this kind of equipment considering the technical specification of the grab in use. Various grabs will be available for the benthic survey provision to ensure adequate sampling equipment for various sediment types. From the grab samples a small amount of sediment can be retained for Particle Size Analysis and Loss on Ignition Analysis.

Van Veen/other suitable methods will be used for soft sediments for quantitative benthic infauna analysis and for physio–chemical analysis. Colonial and epifaunal species will be recorded qualitatively. Sediment samples for physio–chemical analysis will be acquired for later laboratory analysis.

Mini and Standard Hamon Grabs (0.1m^2 and 0.2 m^2 respectively are particularly used for the collection of samples generally from coarse (sand and gravel) sediment substrates and used for benthic macrofauna and particle size measurement. The grab is relatively simple to operate in almost any water depth.

A 0.1m² sample area is a standard practice used in many benthic sampling applications. The Hamon Grab is a box shaped sampling scoop mounted in a triangular frame. Upon contact with the seabed, tensioned wires are released, which causes the sampling bucket to pivot through 90º pushing seabed sediment into the bucket. On completion of its travel the open end of the bucket comes against a rubber sealed steel plate which stops the sediment escaping during recovery. 0.1m² Hamon Grab refers to 0.1m² area of seabed sampled. The depth of scoop penetration is up to 20cm. On recovery the grab is landed onto a rectangular base from where access can be gained to the inside of the bucket via an inspection window. Whilst in the stand the grab sample can then be easily emptied into a sampling container located under the bucket.

In any case where benthic sampling is not possible, sufficient video and stills will be taken from the sample location to identify existing habitats (to include Annex I habitats) and the habitat boundaries.

This survey provides camera footage to aid in the classification of submerged habitats and is a non-invasive survey for habitats and fauna. The survey period for benthic habitats is year-round.

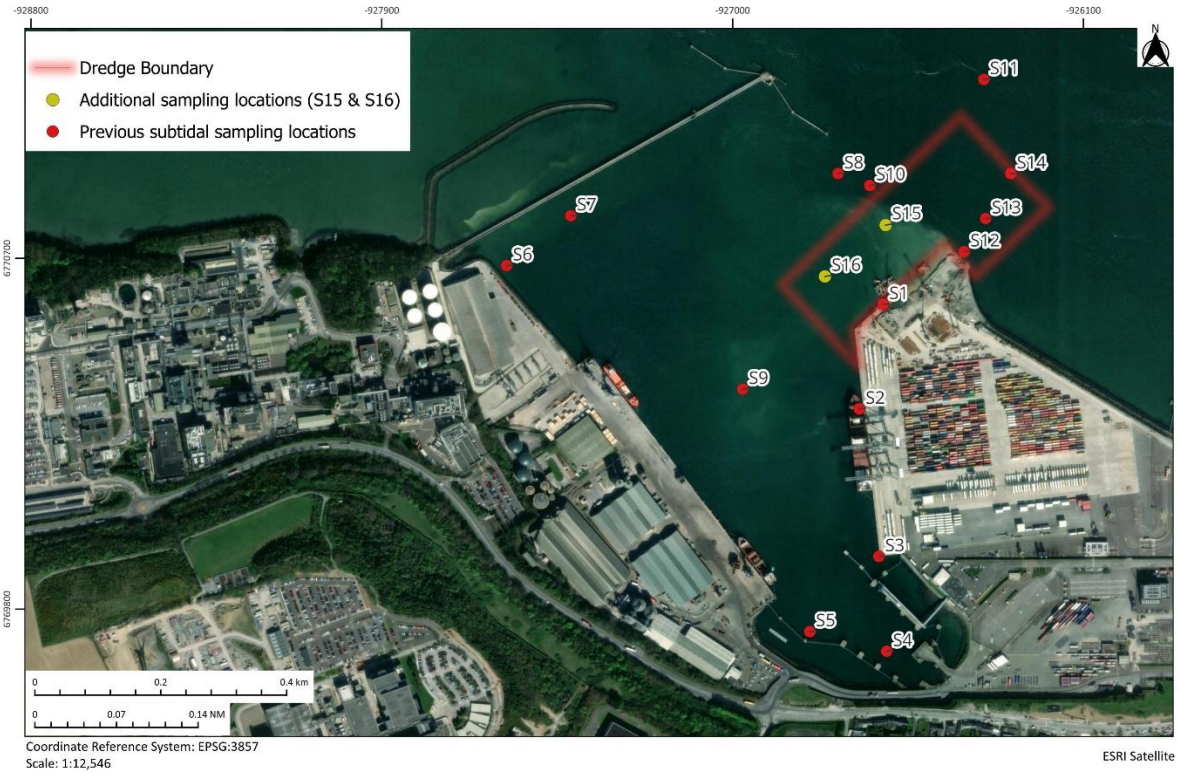

Figure 2: Proposed and Historical Benthic Grab Sample Locations.

Appendix A: Marine Institute Sampling Plan

Rinville
Oranmore
Co Galway
Tel: 091 387200

Colm Sheehan
The Bates Partnership
Cork.

10/02/2026

Re: Sampling and Analysis Plan – Port of Cork, Ringaskiddy ORE Enhancement Capital Dredging

Dear Colm,

A sampling and analysis plan is detailed below for capital dredging of approximately 120, 000 m^3 of sediment at Ringaskiddy. Seventeen samples are recommended, including some at depth, where possible.

Your selected analysing laboratory must be able to meet the quality requirements for this project. You should give your contractor a copy of this plan. You will need to draw their attention especially to Section 3 and Section 4 to confirm that they are capable of meeting the quality assurance standards.

Results of testing should be reported in EPA spreadsheet format, which can be found here.

If you need clarification on anything, please don't hesitate to contact me.

Best regards,

MCronin

_____

Margot Cronin
Marine Environment Chemist

1.0 Sample location and analyses required:

Twenty eight surface samples should be taken for chemical analysis, as detailed in Table 1 (below). Sample locations are mapped in Figures 1a, 1b, 1c at the end of this document.

Table 1. Locations and details of proposed samples

Sample Location	Name	Sample No.	Depth (m)	Longitude	Latitude	Parameters for analysis
V1	V1.1	01	Surface	-8.32428	51.83623	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g
V1	V1.2	02	-3	-8.32428	51.83623	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g
V1	V1.3	03	-6	-8.32428	51.83623	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g
V2	V2.1	04	Surface	-8.32473	51.83666	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g
V2	V2.2	05	-2m	-8.32473	51.83666	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g
V3	V3.1	06	Surface	-8.32346	51.83703	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g
V3	V3.2	07	-2	-8.32346	51.83703	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g
V3	V3.3	08	-4	-8.32346	51.83703	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g
V4	V4.1	09	Surface	-8.32342	51.83746	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g
V4	V4.2	10	-2.5	-8.32342	51.83746	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g
G5	G5	11	Surface	-8.32339	51.83674	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g
G6	G6	12	Surface	-8.32470	51.83579	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g
G7	G7	13	Surface	-8.32563	51.83667	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g
G8	G8	14	Surface	-8.32209	51.83717	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g
G9	G9	15	Surface	-8.32402	51.83759	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g
G10	G10	16	Surface	-8.32104	51.8377	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g
G11	G11	17	Surface	-8.32234	51.83851	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g

* Positions given in decimal degrees, WGS84

2.0 Parameter Code:

1. Visual inspection, to include colour, texture, odour, presence of animals etc
2. Water content, density (taking into account sample collection and handling)
3. Granulometry including % gravel (> 2mm fraction), % sand (< 2mm fraction) and % mud (< 63μm fraction).
4. The following determinants in the sand-mud (< 2mm) fraction * :
   a) total organic carbon
   b) carbonate
   c) mercury, arsenic, cadmium, copper, lead, zinc, chromium, nickel, lithium, aluminium.
   d) organochlorines HCH and γ-HCH (Lindane), and PCBs (to be reported as the 7 individual CB congeners: 28, 52, 101, 118, 138, 153, 180).
   e) total extractable hydrocarbons.
   f) tributyltin (TBT) and dibutyltin (DBT)
   g) Polycyclic aromatic hydrocarbons (PAH) - Acenaphthene, Acenaphthylene, Anthracene, Benzo (a) anthracene, Benzo (a) pyrene, Benzo (b) fluoranthene, Benzo (ghi) perylene, Benzo (k) fluoranthene, Chrysene, Dibenz (a,h) anthracene, Flourene, Fluoranthene, Indeno 1,2,3 – cd pyrene, Naphthalene, Phenanthrene, Pyrene.
   h) Toxicity tests (Microtox or whole sediment bioassay) using appropriate representative aquatic species. (This requirement will depend on the results of the chemical analyses.)

**where the gravel fraction (> 2mm) constitutes a significant part of the total sediment, this should be taken into account in the calculation of the concentrations.*

3.0 Important notes:

3.1 Details of the methodologies used must be furnished with the results. This should include sampling, sub sampling and analytical methods used for each determinant

3.2 Appropriate marine CRM are to be analysed during each batch of analyses and the results to be reported along with sample results.

3.3 The required detection limits for the various determinants are given in Table 2. below.

Table 2. Maximum limits of detection required

Contaminant	Concentration	Units (dry wt)
Mercury	0.05	mg kg^{-1}
Arsenic	1.0	mg kg^{-1}
Cadmium	0.1	mg kg^{-1}
Copper	5.0	mg kg^{-1}
Lead	5.0	mg kg^{-1}

Zinc	10	mg kg^{-1}
Chromium	5.0	mg kg^{-1}
Nickel	15	mg kg^{-1}
Total extractable hydrocarbons	10.0	mg kg^{-1}
TBT and DBT (not organotin)	0.01	mg kg^{-1}
PCB – individual congener	0.1	µg kg^{-1}
OCP – individual compound	1.0	µg kg^{-1}
PAH – individual compound	20	µg kg^{-1}

4.0 Reporting requirements

Reports should include the following information

4.1 Results of testing should be reported in EPA spreadsheet format, which can be found here.

4.2 Spreadsheet results to include:

- 4.2.1 Tabulated geophysical/chemical test results
- 4.2.2 Clear expression of units
- 4.2.3 Indication of wet weight or dry weight basis
- 4.2.4 Location of samples in decimal degrees WGS84 (latitude/longitude).
- 4.2.5 Date of sampling
- 4.2.6 Treatment of samples and indication of sub sampling, compositing etc.
- 4.2.7 Summary method details
- 4.2.8 CRM results
- 4.2.9 QA /QC
- 4.2.10 Other quality assurance information (e.g. accreditation status)
- 4.2.11 Project details.

4.3 If determinant is not detected, report less than values, and indicate LoD/ LoQ used.

4.4 Testing laboratories may be asked to provide additional details of method performance including limit of detection, precision, bias.

Figure 1a: Sampling stations, Ringaskiddy ORE Enhancement. Co-ordinates given in Table 1.