



## EIAR Addendum

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Appendix 8-B Landfall and  
Intertidal Survey Report 2025



# Appendix 8-B Landfall and Intertidal Survey Report 2025

CWP-NPC-CON-10-REP-0009

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**Codling Wind Park Limited**

05 February 2026



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# Document history

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Acronym	Definition
BAC	Background Assessment Concentrations
CWP	Codling Wind Park
CWPL	Codling Wind Park Limited
DBT	Dibutyltin
EAC	Environmental Assessment Criteria
EIAR	Environmental Impact Assessment Report
JAMP	Joint Assessment & Monitoring Programme
MAC	Marine Area Consent
MarLIN	The Marine Life Information Network
MBT	Monobutyltin
NBDC	National Biodiversity Data Centre
NPWS	National Parks and Wildlife Service
OSPAR	Oslo and Paris Conventions
OWF	Offshore Wind Farm
PAH	Polyaromatic hydrocarbons
PBT	Polychlorinated biphenyls

Acronym	Definition
PSA	Particle Size Analysis
PSA	Particle Size Analysis
RFI	Request for Further Information
SAC	Special Area of Conservation
TBT	Tributyltin
TOC	Total Organic Carbon

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# 1. Introduction

## 1.1. Project Background

Codling Wind Park Limited (CWPL) is proposing to develop the Codling Wind Park (CWP) Project, which is located in the Irish Sea approximately 13 - 22 km off the east coast of Ireland, at County Wicklow.

On Friday 6th September 2024 CWPL (referred to hereafter as the 'Applicant') applied for planning permission to An Coimisiún Pleanála (ACP) (referred to hereafter as the 'Commission') under Section 291 of the Planning and Development Act (PDA) 2000, as amended, for the construction, operation and decommissioning of the CWP Project.

On 1st August 2025, having reviewed the application documentation, including the Environmental Impact Assessment Report (EIAR) and the Natura Impact Statement (NIS), the Commission issued a Further Information Request (FIR) in relation to the CWP Project.

Natural Power Consultants Ltd (Natural Power) has been appointed to manage and execute the delivery of a Phase I intertidal survey to support the Applicant's FIR response. The survey was to be undertaken at 23 intertidal sampling stations with a subset of ten stations sampled for PSA, TOC and contaminated sediment analysis. The survey was conducted in 2025.

This document is intended to support **Section 8** of the **EIAR Addendum** and provides a validation of the baseline characterisation for the intertidal area provided in **Volume 3, Chapter 8 Subtidal and Intertidal Ecology** and **Volume 4, Appendix 8.3 Benthic Baseline Report** of the EIAR.

## 1.2. Survey Objectives

This report has been produced to present the findings of the intertidal survey covering the landfall area of the CWP Project OECC, as required by the Commission's FIR. The survey had three objectives:

- To provide a contemporary characterisation of the intertidal baseline environment present within the intertidal survey area;
- To identify the occurrence and distribution of any habitats or species of conservation; and
- To assess any levels of contaminants present within the intertidal survey area.

## 2. Intertidal Survey Design

Sampling stations were located throughout the intertidal survey area with locations positioned to achieve the following criteria:

- Repeat locations previously sampled for comparison where possible;
- Achieve an even spread of locations across the intertidal survey area; and
- Provide information on any levels of contaminants within the intertidal survey area.

### 2.1. Summary of Existing Knowledge of the Site

The CWP intertidal survey area sits within the South Dublin Bay Special Area of Conservation (SAC), directly south of Dublin Bay Power Plant and Poolbeg Power station. The habitat is reflective of a coastal system with extensive mudflats and sandflats and incipient dune formations. These habitats, along with saltmarsh habitats, are the qualifying features of South Dublin Bay SAC. Within the mudflats and sandflats Qualifying Interest of South Dublin Bay SAC, lies a *Zostera noltii* bed present near Merrion Gate, approximately 1.5 km from the OECC/landfall (NPWS, 2013).

Within the landfall area of the cable corridor, predetermined sampling stations were positioned in a grid format and selected to represent upper, mid, and lower shore environments, with additional stations established where notable changes in sediment type were observed. The locations of all sampling stations are provided in Appendix A (Table AA).

The 2021 site specific intertidal survey found the majority of the sediment type across the lower, middle and upper shore was fine sand or very fine sand, with two sites consisting of coarser sediment in the mid and upper shore. Faunal diversity was low across the majority of stations sampled, with the majority of taxa and individuals found in the mid to upper shore. The lower shore habitat was homogeneous fine sand with worm casts of *Arenicola marina*, patches of *Ulva* sp. and brown filamentous algae. Patches of *Ulva* sp. were frequent at the stations close to Landfall at the mid shore.

Biotopes at landfall were classified as Littoral Sand (LS.LSa) apart from two small areas which were classified as Littoral Coarse Sediment (LS.LCS) and Littoral Mixed Sediment (LS.LMx). The mixed sediment was found at the top of the shore where more cobbles and boulders were present.

### 3. Survey Methodology

The Intertidal survey was performed by two experienced ecologists, at the low water phase of spring tides, with a date chosen to maximise daylight over the low water period (**Table A**).

**Table A: Tide and daylight conditions during the survey**

Date	Low tide time	Tidal Height (m)	Sun rise/set
09/09/2025	06:38	0.20m	06:48/19:55
10/09/2025	07:17	0.22m	06:50/19:52
22/09/2025	18:20	0.80m	07:11/19:23

Source: <https://www.tidetimes.org.uk>

A Phase 1 intertidal survey consisting of 23 sampling stations for *in situ* sediment and benthic faunal analysis, with a subset of 10 sampling stations for laboratory contaminants, Particle Size Analysis (PSA) and Total Organic Carbon (TOC) analysis, was undertaken in September 2025 in accordance with (Department of Communications, Climate Action and Environment (DCCA), 2016), JNCC Procedural Guideline No. 3-1 (Wyn & Brazier, 2001) and OSPAR Joint Assessment & Monitoring Programme (JAMP) guidelines for monitoring contaminants in sediments, as set out by the Marine Institute (2006). Stations were selected to repeat locations previously sampled in the 2021 survey (CWPL, 2023), where possible, for comparison to the previous intertidal baseline and which were representative of upper, mid, and lower shore environments. Predetermined sampling stations were positioned in a grid format across the landfall area of the cable corridor. The locations of the sampling sites are outlined in **Figure A** and Appendix A.

At each sampling station a 0.25 m<sup>2</sup> quadrat was placed and a photograph taken. Two spade loads (approximately 0.02 m<sup>2</sup>) of sediment were collected, dug to a depth of 20–25 cm and sieved through a 0.5 mm mesh sieve. Species were identified and recorded, with abundance recorded for conspicuous taxa and percentage cover estimated for encrusting or colonial taxa.

At stations where samples were to be collected for contaminants, PSA and TOC analysis, samples were taken with the appropriate metal or plastic scoop and transferred to appropriate containers for each analysis. The samples were stored in accordance with the Guidelines for sampling / storage of sediments for chemical analyses (from OSPAR JAMP guidelines for monitoring contaminants in sediments) (Marine Institute, 2006).

Once a sampling station was complete, surveyors moved to the next station. All field observations were georeferenced using handheld GPS units and logged on standardised pro-forma datasheets to facilitate robust comparison across stations and repeat surveys.

Sediment samples were collected from representative intertidal stations for analysis of PSA, TOC and sediment contaminants. using a metal scoop and the sample labelled and transported in a cool box prior to analysis. Contaminants samples were collected stored in accordance with the guidelines for sampling / storage of sediments for chemical analyses (from OSPAR Joint Assessment and Monitoring Programme (JAMP) guidelines for monitoring contaminants in sediments) (Cronin et al., 2006).

#### 3.1. Sample Analysis

PSA analysis was determined to fractions ranging between <63 µm to >256 µm. Approximately 100 g of dried sediment was weighed out and underwent peroxide treatment to remove any organic material. Sediment samples were then processed through stacked sieves at particle size diameters of 0.5 phi intervals over the range 63 µm to <8 mm (Wentworth Scale), sieve sizes are provided in **Table B**. The sieves were shaken, and the contents of each

sieve subsequently weighed. The total silt/clay fraction was determined by subtracting all weighed fractions from the initial starting weight of sediment as the less than 63µm fraction was lost during the various washing stages. The weights were used to calculate the percentage of each particle size range contained in the sample.

**Table B The classification of sediment particle size ranges into size classes (adapted from Buchanan, 1984).**

Range of Particle Size	Classification	Phi Unit
<63µm	Silt/Clay	>4 Ø
63-125 µm	Very Fine Sand	4 Ø, 3.5 Ø
125-250 µm	Fine Sand	3 Ø, 2.5 Ø
250-500 µm	Medium Sand	2 Ø, 1.5 Ø
500-1000 µm	Coarse Sand	1 Ø, 1.5 Ø
1000-2000 µm (1 – 2mm)	Very Coarse Sand	0 Ø, -0.5 Ø
2000 – 4000 µm (2 – 4mm)	Very Fine Gravel	-1 Ø, -1.5 Ø
4000 -8000 µm (4 – 8mm)	Fine Gravel	-2 Ø, -2.5 Ø
8 -64 mm	Medium, Coarse & Very Coarse Gravel	-3 Ø to -5.5 Ø
64 – 256 mm	Cobble	-6 Ø to -7.5 Ø
>256 mm	Boulder	< -8 Ø

TOC samples were analysed via Loss on Ignition (LOI) whereby each sample is weighed before being heated to a high temperature (100 °C) until all the carbon dioxide from carbonates is burned off and the sample is weighed again. The difference in weights is the LOI organic content of the sample, expressed as a percentage of the weight of the sediment after ignition, over the initial weight of the sediment.

Contaminants samples were analysed for the Marine Institute full suite of analyses as detailed in the Material Analysis Reporting Form by a United Kingdom Accreditation Service (UKAS) accredited laboratory and the results compared against Irish guideline limits and Cefas Action levels (Appendix D).

## 3.2. Data analysis

All data collected during the intertidal surveys were transcribed and information on habitats and species collated in an excel spreadsheet (including up to date species nomenclature, abundance, and physical parameters such as PSA, and depth of anoxic layer).

The data was examined in order to identify any species or habitats of conservation interest. This includes, Habitats Directive Annex I habitats, UK Priority Marine Habitats and Species<sup>1</sup> UKBAP List species, rare/scarce species and habitats) using the Marine Life Information Network (MarLIN) resource.

Intertidal biotopes were assigned according to the Marine Habitat Classification (Connor *et al.*, 2004) from the walk over surveys, aerial imagery and infaunal data, depending on the substrate sampled, using expert judgement in line with the relevant guidance (Parry, 2019) and JNCC comparative tables<sup>2</sup>.

<sup>1</sup> Available from <https://jncc.gov.uk/our-work/uk-bap-priority-habitats/>

<sup>2</sup> Available from <https://hub.jncc.gov.uk/assets/62a16757-e0d1-4a29-a98e-948745804aec>

## 4. Results

The Phase 1 intertidal survey consisting of 23 sampling stations for *in situ* sediment and benthic faunal analysis, with a subset of 10 sampling stations for laboratory sediment and contaminants, was carried out over three days in September 2025.

### 4.1. Sediment

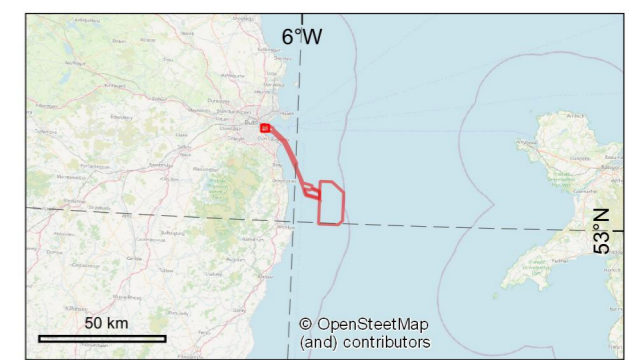
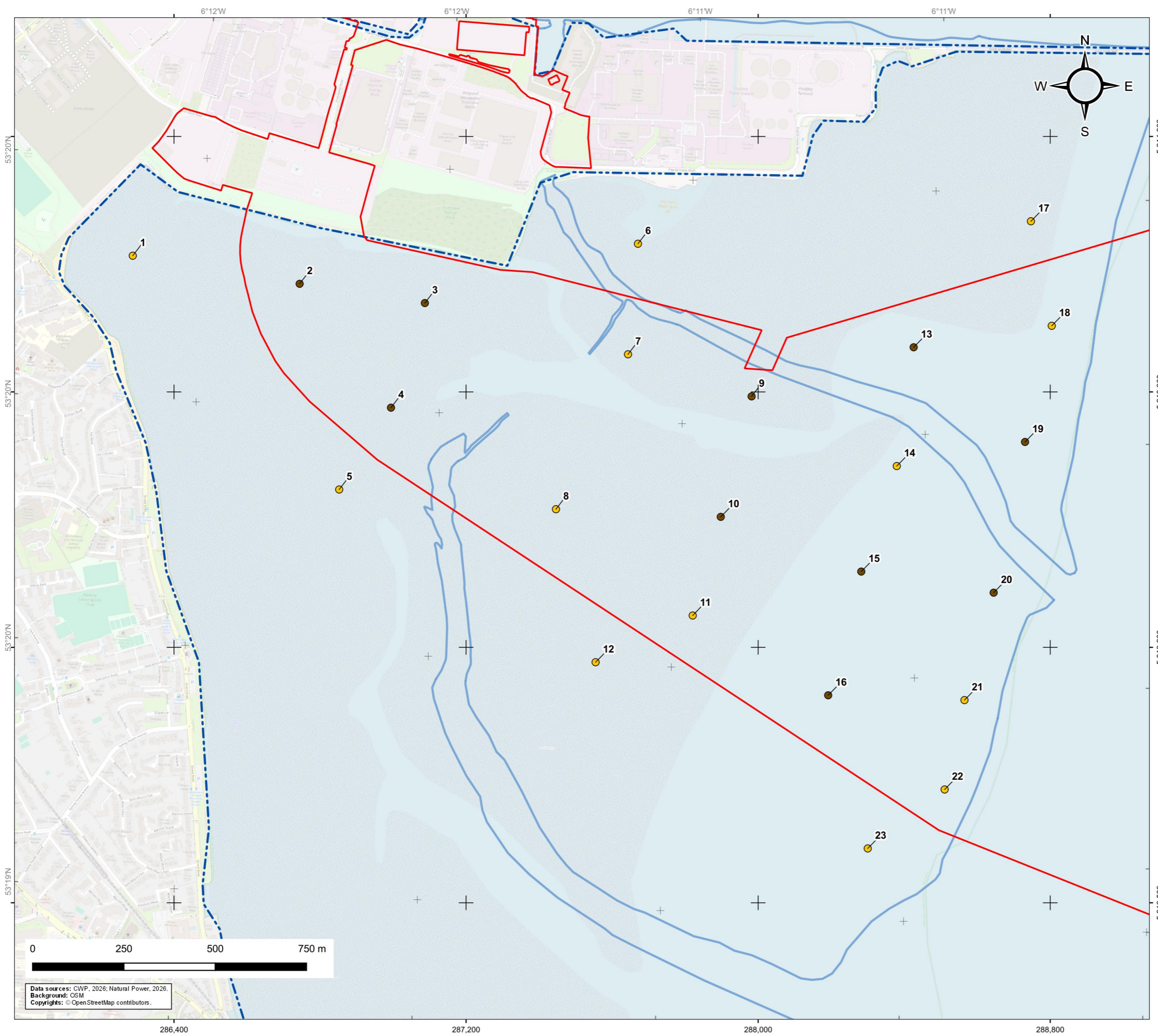
*In situ* sediment descriptions suggested all 23 stations comprised muddy sand however there is variation between the proportion of muddy sand, broken shells and algae between stations. 18 stations across both the higher and lower shore comprised of sand and broken shells and algae was observed at stations on the uppermost shore and some of the lowermost stations.

Of the ten stations with laboratory particle size analysis the sediment across most sites was classified as Sand, however Stations 3 and 4 had a higher percentage of mud and were classified as muddy Sand (Folk, 1954) (**Table C**). Most stations had a small percentage of gravel (<1.0%) and there were two stations with no gravel component.

TOC results were universally low across all the stations (<1.0%). The stations in the upper shore had slightly elevated levels of TOC (Stations 2, 3 and 4).

**Table C: Intertidal survey PSA and TOC results**

Station	Gravel (%)	Sand (%)	Mud (%)	Folk classification	TOC
2	0.68	92.54	6.78	Sand	0.25
3	0.27	71	28.73	muddy Sand	0.21
4	0	83.06	16.94	muddy Sand	0.33
9	0	100	0	Sand	0.12
10	0.18	99.82	0	Sand	0.11
13	0.42	99.58	0	Sand	0.14
15	0.16	99.84	0	Sand	0.14
16	0.55	99.45	0	Sand	0.14
19	0.37	99.63	0	Sand	0.15
20	0.41	96.56	3.03	Sand	0.15



**Legend**

- Planning Application Boundary (PAB)

**Station**

- Intertidal sampling station
- Intertidal sampling and contaminants station

**Maritime limits and tidal boundaries**

- Mean Low Water Spring (MLWS)
- - - Mean High Water Spring (MHWS)

	Project: Codings Wind Park	Contractor:  www.naturalpower.com
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**Figure A**  
Intertidal sampling stations

CWP doc. number: CWP-NPC-CON-09-MAP-2138

Internal descriptive code: N/A	Size: A3 Scale: 1:10,000	CRS: EPSG 25830
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Rev.	Updates	Date	By	Chk'd	App'd
00	For FIR submission	2025/12/08	AC	ME/EA	LJ

Data sources: CWP, 2026; Natural Power, 2026.  
Background: OSM  
Copyrights: © OpenStreetMap contributors.

286,400
287,200
288,000
288,800

## 4.2. Fauna

Faunal diversity and abundance within the sediments was generally low across most of the sampling stations. All the 23 sampling stations did however, yield fauna. A total of 29 species were found across the site, with most of this diversity coming from stations 1, 5, 21 and 23. The most abundant species was the mudsnail *Peringia ulvae* with 120 individuals present at Station 1 the mudsnail is common in muddy sand in estuaries. The faunal species that occurred at the highest number of stations were the bivalve *Macomangulus tenuis* and blow lugworm *Arenicola marina* which were observed at 12 and 11 stations, respectively. Both species are common in mud and sandy mud habitats in the middle and lower shore of the intertidal area. *Ulva fenestrata*, *Ulva intestinalis*, *Fucus serratus* and *Corallina officinalis* were the most observed algae species across the site.

In general, there is a transition from muddy sand with a high abundance of bivalve species and green algae species, some of which can be indicative of organically enriched sediment on the upper shore, to sands with a core assemblage of blow lugworm *Arenicola marina* with bivalve *Macomangulus tenuis* and *Ulva fenestrata* across the lower shore. The full species list for each station is included in Appendix B.

The upper shore stations, Stations 1 to 5, have an increased presence of green algae species, some of which are indicative of organic enrichment (**Figure B**).



**Figure B: Station 3:** Uppershore muddy sand area showing green algae and channel

Station 1 (

**Figure C**), the highest station on the shore, stands out for both the highest species richness and individual abundance, with mixed fauna and three species of algae, *Ulva fenestrata*, *U. intestinalis* and *Nemalion helminthoides*, observed. There were also large numbers of *Peringia ulvae* (120 individuals), three *Cerastoderma edule* and *Arenicola sp.* casts presents. Overall, this site accounted for 9 of the total species recorded.



**Figure C: Station 1** (left: sand area with mixed fauna and green alga; right: faunal sample)

*Cerastoderma edule* was present in all the upper nearshore stations (1, 2, 3, 4, 5), however was particularly abundant in Station 4 (**Figure D**), indicating patches of bivalve presence coinciding with a higher proportion of *Ulva intestinalis* observed in Stations 3, 4 and 5. At Station 5 there was a high concentration of *Urolsalpinx cinerea* was also observed.



**Figure D: Station 4** (left: muddy sand with mixed bivalves and green alga; right: faunal sample)

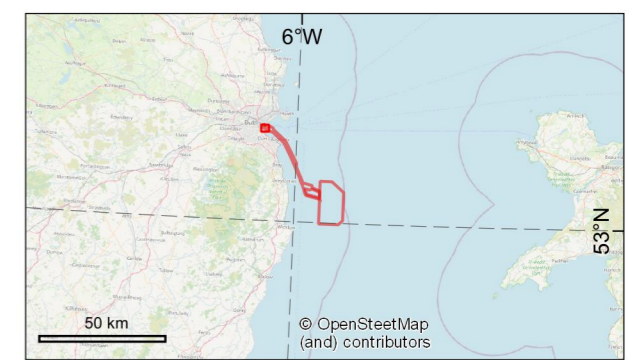
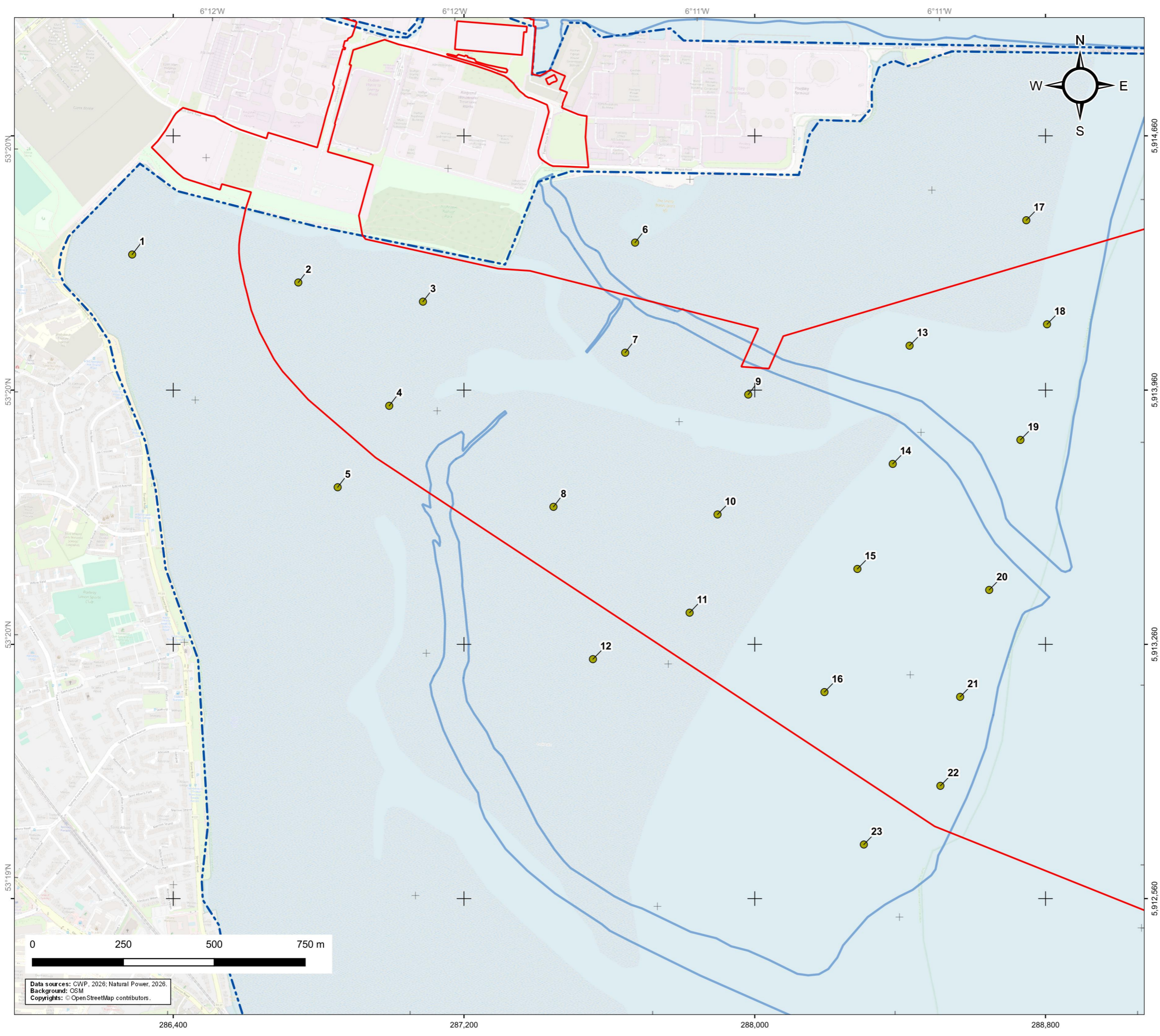
In the lower shore, a core assemblage of *Arenicola marina* with *Macomangulus tenuis* and often *Ulva fenestrata* (**Figure E**) recurs across Stations 12, 15, 17, 20 and 23, forming a coherent cluster with minor variations (e.g., *Lanice conchilega*, *Glycera dibranchiata*, or *Bathyporeia elegans*).



Figure E: Assemblages of *Arenicola marina* with *Macomangulus tenuis* and often *Ulva fenestrata* (left: Station 12 fine sand sediment; right: Station 12 faunal sample)

### 4.3. Biotope Assignment

All the stations across the survey site were classified as the biotope Littoral Sand (LS.LSa) (**Figure F**). The Littoral Sand biotope complex comprises of clean and muddy sands with shells and stones occasionally present on the surface. Mobile, coarse sands are typically species-poor with more stable, finer and muddier sediments supporting diverse communities of amphipods, polychaetes and bivalves. The full biotope description is provided in Appendix C.



**Legend**

- Planning Application Boundary (PAB)

**Biotope**

- Littoral sand (LS.LSa)

**Maritime limits and tidal boundaries**

- Mean Low Water Spring (MLWS)
- - - Mean High Water Spring (MHWS)

	Project: Codling Wind Park	Contractor: natural power <a href="http://www.naturalpower.com">www.naturalpower.com</a>
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### Figure F Intertidal biotopes

CWP doc. number: CWP-NPC-CON-09-MAP-2139

Internal descriptive code: N/A	Size: A3 Scale: 1:10,000	CRS: EPSG 25830
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Rev.	Updates	Date	By	Chk'd	App'd
00	For FIR submission	2025/12/08	AC	ME/EA	LJ

Data sources: CWP, 2026; Natural Power, 2026.  
Background: OSM  
Copyrights: © OpenStreetMap contributors.

286,400
287,200
288,000
288,800

## 4.4. Contaminated sediments

Samples for contaminants were collected at 10 stations within the intertidal area in 2025. The survey results showed that all stations had heavy metal concentrations below the Irish lower action level, however stations 16 and 20 had chromium concentrations slightly above Cefas Action Level (AL) 1 (though considerably below but below AL2).

Organotin compounds (tributyl tin (TBT), dibutyl tin (DBT) and monobutyltin (MBT) were below the limits of detection and there was no exceedance of Irish or Cefas ALs at any of the sampling stations and no Irish or Cefas ALs were exceeded for polychlorinated biphenyls (PCBs) or polyaromatic hydrocarbons (PAHs).

The results of contaminant analysis are provided in Appendix D.

## 4.5. Annex I habitats and Species

### 4.5.1. Seagrass

No seagrass beds were recorded within the Planning Application Boundary (PAB) of the proposed development (i.e., the application area). However, several small patches of seagrass were identified approximately 20 m from Station 5 which is outside the PAB (**Figure G**). These patches range in size from approximately 0.5 m<sup>2</sup> to 2.5 m<sup>2</sup> and did not constitute a seagrass bed. The patches represent a recent development in the local habitat mosaic, as they were not present during the previous intertidal survey (2021) undertaken for the site.



**Figure G: Seagrass observed in the locality of Station 5**

The seagrass observed was present alongside the non-native red seaweed *Gracilaria vermiculophylla*, also outside of the PAB. The presence of *G. vermiculophylla* is notable as it can alter sediment dynamics, shading, and intertidal community structure, and has been documented in Ireland as capable of interacting with native seagrass habitats.

## 5. Discussion

All stations sampled at landfall were classified as the biotope Littoral sand (LS.LSa). This is generally in agreement with the 2021 intertidal survey where all stations were classified as Littoral sand (LS.LSa), with the exception of one station classified as Littoral mixed sediments (LS.LMx) and another as Littoral coarse sediments (LS.LCS). Sediment in the upper shore had a higher mud content in comparison to the lower shore where all stations had no mud content, with the exception of Station 20. The higher mud content aligned with higher TOC levels observed in upper shore sediment and lower shore. Stations closest to landfall contained moderate amounts of green algae species such as *Ulva intestinalis* which may indicate some nutrient enrichment which can occur due to agricultural run-off or other sources of nutrient enrichment.

Faunal diversity was low across the majority of stations sampled, with the majority of taxa and individuals found in the mid to upper shore. In general, there is a transition from muddy sand with a high abundance of bivalve species and green algae species in the upper shore to sands with a core assemblage of blow lugworm *Arenicola marina* with bivalve *Macomangulus tenuis* and *Ulva fenestrata* across the lower shore. Overall, the species recorded were typical of sand and muddy sand habitats in the intertidal zone.

No Annex I habitats or Annex II species were recorded within the PAB of the proposed development. However, several small patches of seagrass were identified approximately 20 m from one of the sampling stations, outside the PAB.

Contaminated sediment results showed low levels of chemical contaminants at the ten stations sampled within the PAB. All contaminant levels were below Irish Lower action levels. Two stations (16 and 20) had chromium concentrations slightly above Cefas AL 1, but below AL2. This differs in comparison to the 2021 intertidal survey, where there were occurrences of arsenic and cadmium over the Irish Lower action level and zinc and cadmium levels were slightly above the Cefas AL1, but below AL2.

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## Appendices

### A. Locations of Sampling Station and Type of Sample Taken

Table AA: Intertidal intertidal sediment sampling stations

Sampling Station	Latitude	Longitude	Contaminants (Y/N)
1	53°20'5.724" N	6°12'35.552" E	N
2	53°20'3.902" N	6°12'10.689" E	Y
3	53°20'2.693" N	6°11'52.049" E	Y
4	53°19'53.294" N	6°11'56.364" E	Y
5	53°19'45.842" N	6°12'3.478" E	N
6	53°20'8.789" N	6°11'20.933" E	N
7	53°19'58.958" N	6°11'21.673" E	N
8	53°19'44.959" N	6°11'31.300" E	N
9	53°19'55.721" N	6°11'3.118" E	Y
10	53°19'44.932" N	6°11'6.884" E	Y
11	53°19'36.084" N	6°11'10.380" E	N
12	53°19'31.565" N	6°11'24.427" E	N
13	53°20'0.710" N	6°10'39.481" E	Y
14	53°19'50.126" N	6°10'41.197" E	N
15	53°19'40.641" N	6°10'45.750" E	Y
16	53°19'29.557" N	6°10'49.829" E	Y
17	53°20'12.330" N	6°10'22.970" E	N
18	53°20'3.155" N	6°10'19.205" E	N
19	53°19'52.764" N	6°10'22.392" E	Y
20	53°19'39.295" N	6°10'26.037" E	Y
21	53°19'29.668" N	6°10'29.647" E	N
22	53°19'21.674" N	6°10'31.992" E	N
23	53°19'16.150" N	6°10'42.968" E	N

Source: Natural Power

## B. Species List

Table BA: 2025 intertidal survey species list

Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Number of Occurrences	Total Count	Total %
<i>Arenicola marina</i>												1	4	3	3	1	4			1	2	1	2	11	22	-
<i>Arenicola sp</i>				1	1	1				1	1											1		6	6	-
<i>Bathyporeia elegans</i>																	1							1	1	-
<i>Callithamnion sp</i>																10%								1	-	10
<i>Carcinus maenas</i>			1											1										2	2	-
<i>Cerastoderma edule</i>	3	4	2	10	2																			5	21	-
<i>Corallina officinalis</i>				7%									5%	8%										3	-	20
<i>Glycera dibranchiata</i>																		2	2	1			1	4	6	-
<i>Glycera sp</i>			2																					1	2	-
<i>Himantalia elongata</i>								5%																1	-	5
Isopod	1						1																1	3	3	-
<i>Lanice conchilega</i>											1			1	1								1	5	5	-
<i>Macomangulus tenuis</i>					1		6	4	3		1	4			1		1			1		1	2	11	25	-
<i>Nemalion helminthoides</i>	1%																							1	-	1
<i>Nephtys hombergii</i>																		1			2			2	3	-
<i>Peringia ulvae</i>	120																							1	120	-
<i>Phyllodoceidae sp</i>																1								1	1	-
<i>Tellina tenuis</i>											1													1	1	-
<i>Ulva fenestrata</i>									1%	6%				1%			1%				1%			5	-	10
<i>Ulva intestinalis</i>	5%		35%	20%																				3	-	60
<i>Ulva lactuca</i>	5%																							1	-	5
<i>Urosalpinx cinerea</i>					50																			1	50	0
<i>Verrucaria maura</i>	1%																							1	-	1
<i>Zostera marina</i>		1%																						1	-	1

## C. Full biotope description

Source - JNCC Marine Habitat Classification (<https://mhc.jncc.gov.uk/>)

### **LS.LSa – Littoral sand**

Shores comprising clean sands (coarse, medium or fine-grained) and muddy sands with up to 25% silt and clay fraction. Shells and stones may occasionally be present on the surface. The sand may be duned or rippled as a result of wave action or tidal currents. Littoral sands exhibit varying degrees of drying at low tide depending on the steepness of the shore, the sediment grade and the height on the shore. The more mobile sand shores are relatively impoverished (MoSa), with more species-rich communities of amphipods, polychaetes and, on the lower shore, bivalves developing with increasing stability in finer sand habitats (FiSa). Muddy sands (MuSa), the most stable within this habitat complex, contain the highest proportion of bivalves.

## D. Contaminated sediment results

Table DA: Metal levels with sediment samples

Metal (mg/kg)	Sampling Station										CEFAS AL1 (ug/Kg)	CEFAS AL2 (ug/Kg)	Irish Lower AL (ug/Kg)	Irish Upper AL (ug/Kg)
	2	3	4	9	10	13	15	16	19	20				
Arsenic	4	4.1	4.6	4.3	4.8	5.6	4.7	5.4	5.3	5.4	20	100	9	70
Cadmium	0.04	0.07	0.09	0.05	0.03	0.06	0.03	0.04	0.04	0.03	0.4	5	0.7	4.2
Chromium	19.5	24.2	21.6	20.4	21.5	34.6	26.6	40.9	25.8	44.9	40.0	400.0	120	370
Copper	4.5	4	4.3	3.2	2.9	3.6	3	3.3	3	3.2	40	400	40	110
Lead	10.3	11.4	12.2	9.8	10.2	13.5	10	11.7	10.9	12.6	50	500	60	218
Mercury	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.3	3	0.2	0.7
Nickel	6.4	7.5	8	6.7	6.4	9.4	6.9	8.8	8.4	8.4	20	200	21	60
Zinc	22.6	30	29.6	19.4	21.1	31.2	19.4	25.5	22.2	23.8	130	800	160	410
Aluminium	18700	26200	24000	21500	17700	19200	18700	18100	22100	80601	none	none	none	none
Lithium	19.6	30.8	29.1	22.2	18	19.7	19	18	22.4	21.6	none	none	none	none

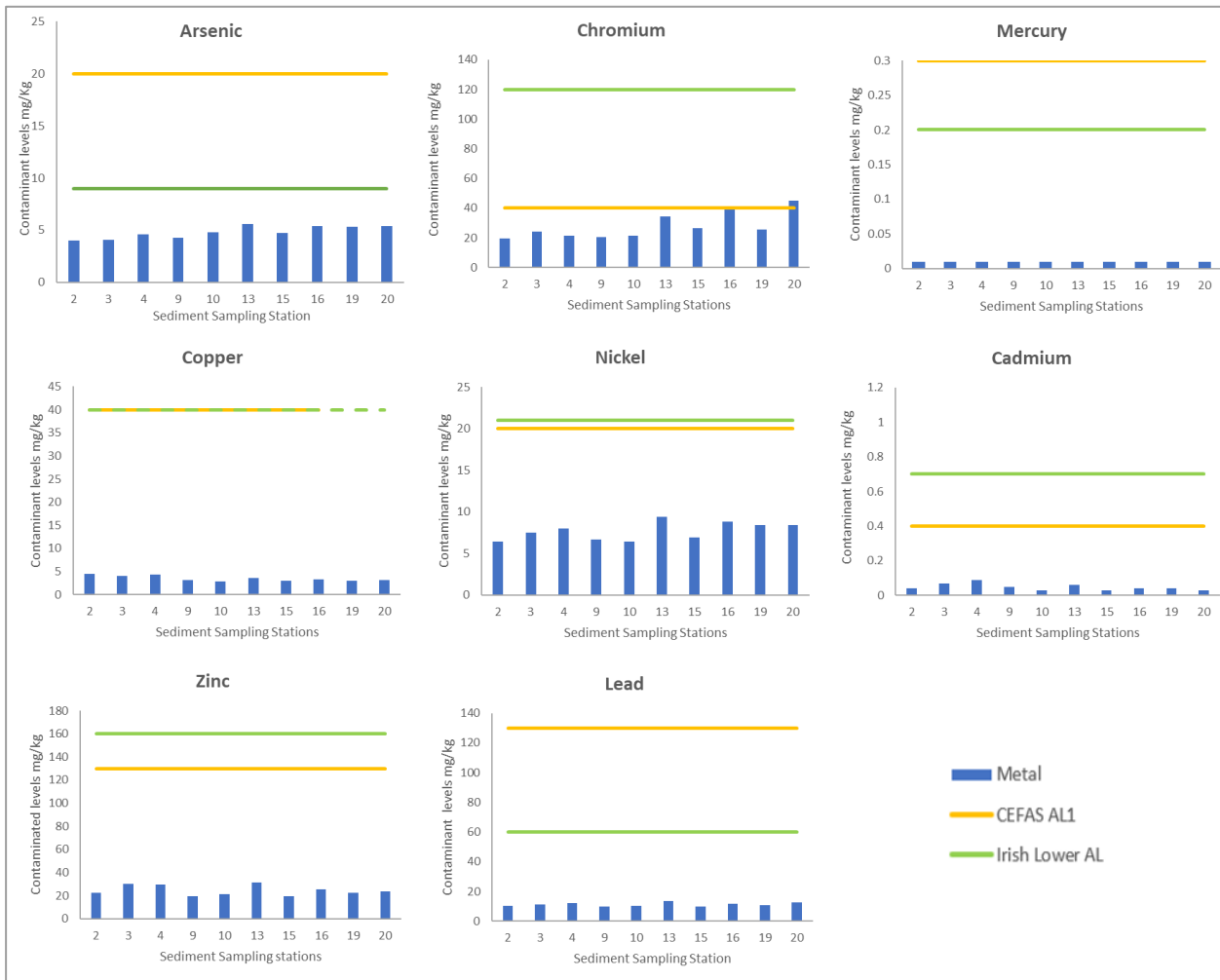


Figure DA: Metal levels within sediment samples compared to CEFAS Action Level 1 (AL1) and the Irish Lower Action Level

Table DB: Levels of Organotins within sediment samples

Sampling Station	2	3	4	9	10	13	15	16	19	20
SOCOTEC Ref:	MAR02808.001	MAR02808.002	MAR02808.003	MAR02808.004	MAR02808.005	MAR02808.006	MAR02808.007	MAR02808.008	MAR02808.009	MAR02808.010
Matrix	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment	Sediment
Dibutyltin (DBT)	<5	<5	<5	<1	<5	<5	<1	<5	<1	<1
Tributyltin (TBT)	<5	<5	<5	<1	<5	<5	<1	<5	<1	<1

Table DC: Levels of Polycyclic Aromatic Hydrocarbons (PAH) and Total Hydrocarbon Content (THC) within sediment samples

PAH and THC (ug/Kg)	Sampling Station										CEFAS AL1 (ug/Kg)	Ireland's Lower AL (ug/Kg)
	2	3	4	9	10	13	15	16	19	20		
ACENAPTH	5.00	1.00	5.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	100	-
ACENAPHY	5.00	1.55	5.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	100	-
ANTHRACN	5.00	3.89	5.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	100	-
BAA	5.00	19.2	13.50	1.00	1.00	1.00	1.00	1.00	1.00	1.00	100	-
BAP	5.00	18.4	14.3	1.00	1.00	1.00	1.00	1.00	1.00	1.00	100	-
BBF	5.00	17.00	14.50	1.00	1.00	1.00	1.00	1.00	1.00	1.00	100	-
BENZGHIP	5.00	11.80	9.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	100	-
BKF	5.00	19.00	13.80	1.00	1.00	1.00	1.00	1.00	1.00	1.00	100	-
CHRYSENE	5.00	23.60	16.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	100	-
DBENZA	5.00	3.10	5.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	100	-
FLUORANT	5.00	25.70	18.3	1.00	1.00	1.00	1.00	1.00	1.00	1.00	100	-
FLUORENE	5.00	3.11	5.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	100	-
INDPYR	5.00	12.40	10.70	1.00	1.00	1.00	1.00	1.00	1.00	1.00	100	-
NAPTH	5.00	5.59	8.09	1.00	1.00	1.00	1.00	1.00	1.00	1.00	100	-
PHENANT	5.00	11.60	10.40	1.00	1.00	1.00	1.00	1.00	1.00	1.00	100	-
PYRENE	8.47	25.10	19.20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	100	-
Sum of PAH's	83	202	174	16	16	16	16	16	16	16	3712	4000
THC	15900	26600	44000	2260	1760	2350	2850	2730	2170	2270	100,000	1,000,000

Table DD: Levels of Polychlorinated Biphenyls (PCB) within sediment samples

PCB (µg/Kg)	Sampling Station										CEFAS AL1 (ug/Kg)	Ireland's Lower AL (ug/Kg)
	2	3	4	9	10	13	15	16	19	20		
PCB28	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	10	7
PCB52	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	10	7
PCB101	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	10	7
PCB118	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	10	7
PCB138	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	10	7
PCB153	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	10	7
PCB180	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	10	7
Sum of PCBs	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	0.56	10	7

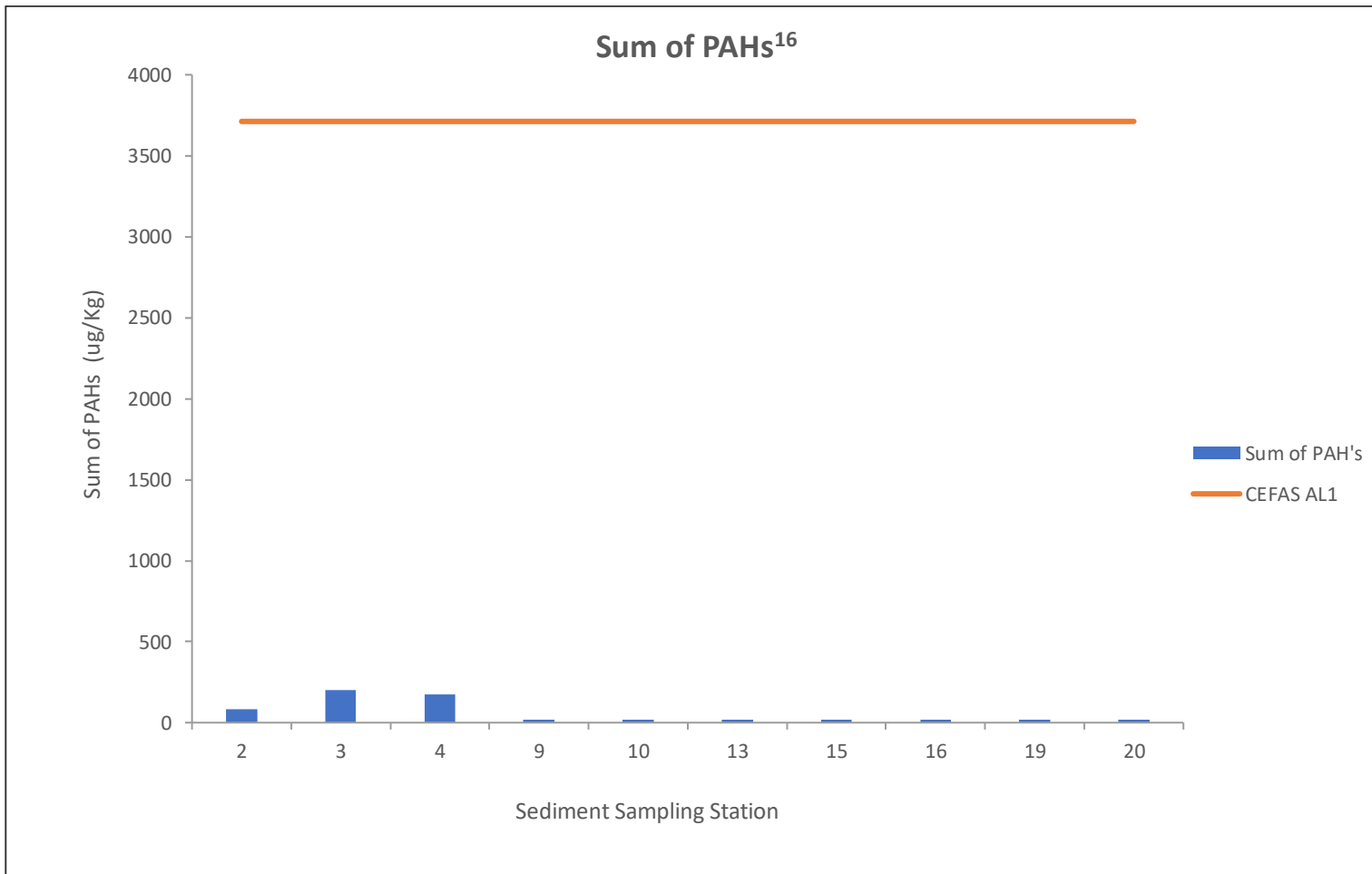


Figure DB: Sum of PAH<sup>16</sup> within sediment samples compared to CEFAS Action Level 1 (AL1)

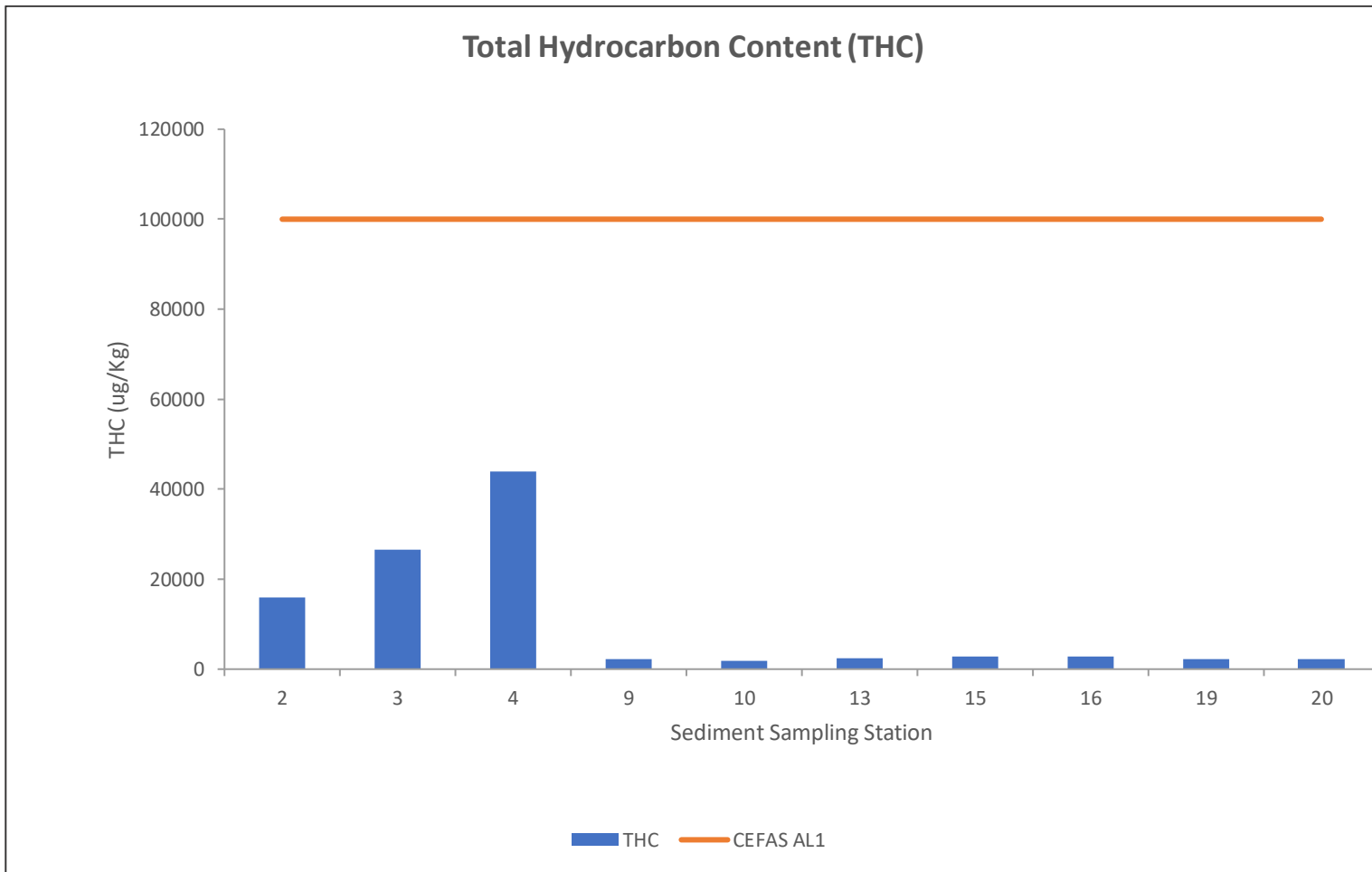


Figure DC: Total Hydrocarbon Content (THC) within sediment samples

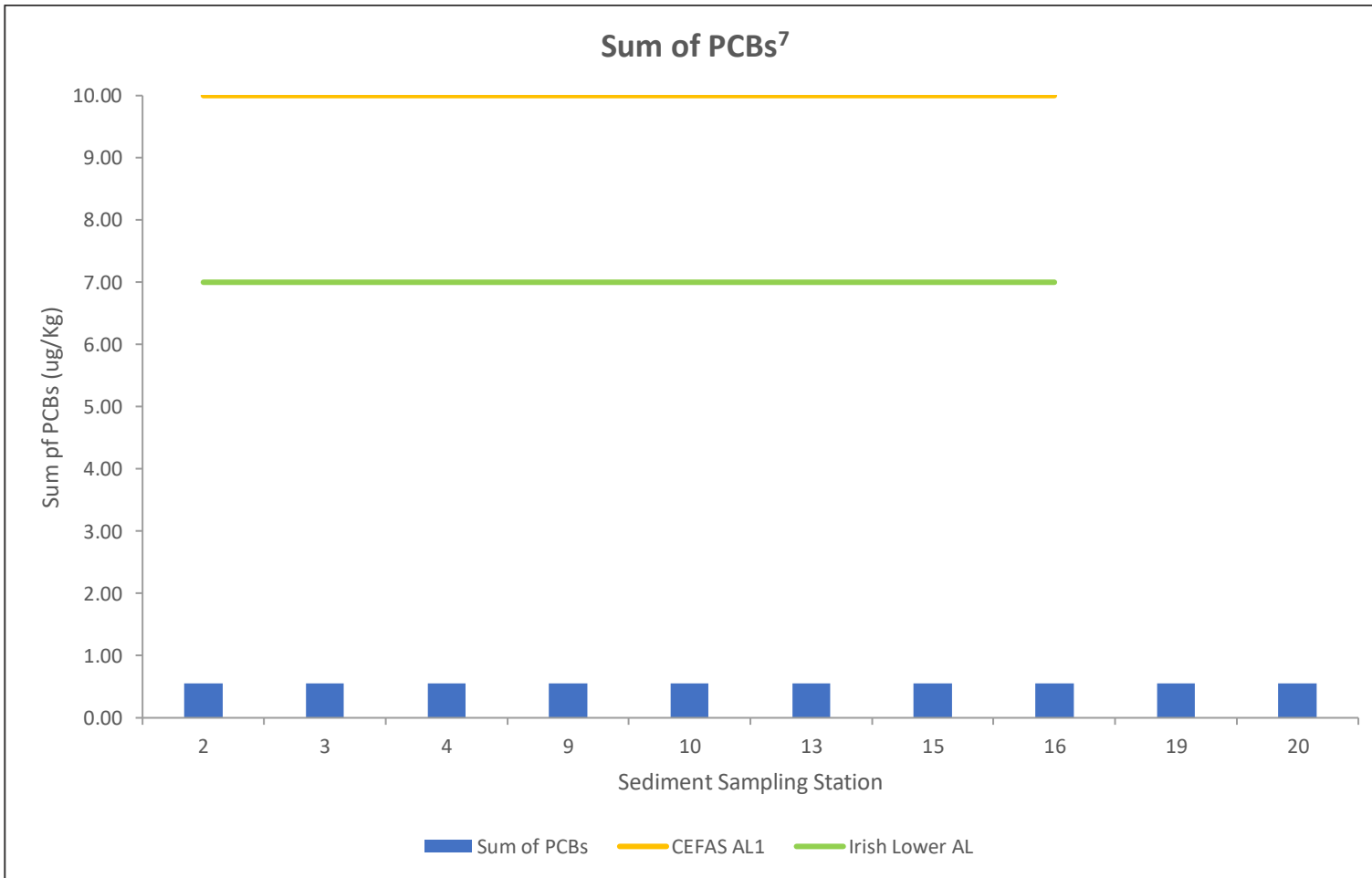


Figure DD: Sum of PCBs<sup>7</sup> within sediment samples compared to CEFAS Action Level 1 (AL1) and the Irish Lower Action Level (AL)



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