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# Volume 7B Proposed Development (Offshore) Appendices

Appendix 4-2 Environmental Baseline Report (Offshore Export Cable Corridor)

Caledonia Offshore Wind Farm Ltd

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# Volume 7B Appendix 4-2 Environmental Baseline Report (Offshore Export Cable Corridor)

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|---|---|
| **Code** | UKCAL-CWF-CON-EIA-RPT-00007-7B08 |
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*This document contains the following report: 'Caledonia OWF Phase 2 Export Cable Route Environmental Baseline Survey' as prepared by Gardline in November 2023. For the purpose of Consent Application, the document has been retitled to: 'Volume 7B, Appendix 4-2: Environmental Baseline Report (Offshore Export Cable Corridor)', alongside the addition of a new front cover.*

Survey Report for:
**Caledonia Offshore Wind Farm Limited**

Project:
**Caledonia OWF Phase 2**
**Export Cable Route**

Description:
**Environmental Baseline Survey**

Survey Date:
**March 2023 to June 2023**

Project Number:
**54463**

Report Status:
**Final**

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## Distribution

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For attention of

[redacted]

# EXECUTIVE SUMMARY


- Integrated survey work along the offshore and nearshore portions of export cable route (ECR) and within the array area, situated in the Moray Firth, were conducted by Gardline Limited on behalf of Caledonia Offshore Wind Farm Limited between March and June 2023 onboard the motor vessel (MV) *Ocean Endeavour*. The nearshore component of the survey was conducted onboard the MV *Titan Discovery* between April and June 2023. Offshore ECR Environmental operations onboard the MV *Ocean Endeavour* were conducted between 19-Mar-2023 and 14-Apr-2023, with the nearshore ECR environmental operations onboard the MV *Titan Discovery* conducted from 02-May-2023 to 21-May-2023.
- Upon completion of the survey, 40 environmental stations were investigated with an additional 19 camera only stations. Of these stations, all except ENV20 and ENV32 had successful sampling suites collected.
- Seabed imagery and observations from grab samples confirmed the presence of sand with varying amounts of gravel and shell fragments.
- Observed fauna was generally sparse, with 57% of stills containing no visible fauna. There was a notable difference in taxa observed in areas of mixed sediment.
- Water profiling at eight stations revealed well mixed upper layers (to *c.*10m). Thermoclines were present at the offshore stations with the nearshore Station ENV53 presenting a well-mixed profile throughout. Dissolved oxygen, pH and turbidity were consistent with published literature for the wider North Sea.
- Particle size analysis at 38 stations supported the seabed imagery with sediment along the ECR classified as sandy gravel to muddy sand under modified Folk (1954). Generally, sand was the dominant fraction accounting for between 54.8% and 98.8% of the sediment.
- Concentrations of total organic carbon at nine stations varied between 0.16% and 0.77% and were positively correlated with fines ($r=0.83$, $p<0.01$).
- Total hydrocarbon concentrations by GC-FID ranged from 2.8µg $g^{-1}$ at the shallowest stations to 18.7µg $g^{-1}$ at the deepest station, with a mean of 10.7µg $g^{-1}$ (±4.6SD). Concentrations of hydrocarbons were below threshold expected to impact faunal communities.
- Gas chromatography traces and the prevalence of higher molecular weight odd-numbered n-alkanes indicated terrestrial plant sources and the residue of highly weathered and biodegraded petrogenic material.
- Total polycyclic aromatic hydrocarbons concentrations were ≤0.150µg $g^{-1}$ and therefore below effect range low (ERL; Long *et al.*, 1995) and apparent effects threshold (AET; Buchman, 2008).
- Concentrations of polychlorinated biphenyls and organotins were below the limit of detection (LOD) at all stations.
- Concentrations of polybrominated diphenyl ethers were below the LOD, with the exception of PBDE 209 at eight of the nine analysed stations, exceeding OSPAR (2020) background assessment criteria after normalisation to 2.5% TOC. However, all concentrations were below Federal Environmental Quality Guidelines (Viñas *et al.*, 2023).
- Organochloropesticides were below LOD at most stations and where recorded did not exceed Cefas Action Level (CAL) 1 (MMO, 2022) concentrations.
- All metal concentrations were below their respective ERLs (Long *et al.*, 1995), AETs (Buchman, 2008) and CALs (MMO, 2022) indicating that toxicological impacts to biota associated with metal concentrations were unlikely to occur.
- A total of 491 operational taxonomic units (OTUs) were recorded from sediment samples along the ECR. This was broken down to 443 bacterial OTUs and 48 infaunal OTUs. Overall, there was a high proportion of widespread taxa and lone taxa suggesting that the community has been subjected to relatively little disturbance.
- A total of 72 OTUs were recorded from water samples, comprising 30 fish OTUs and 42 vertebrate OTUs.
- Macrofaunal analysis identified 1858 adult individuals representing 240 taxa. Polychaetes were the most dominant taxonomic group along the ECR.

- Biomass recorded a total adult wet weight of 270.092g along the ECR. As expected, when classified by biomass, Mollusca was the most dominant taxa, as expected due to the size difference when compared to polychaetes.
- EUNIS classification was conducted based on all data collected from the survey, resulting in six level 4 and two level 5 biotope classifications ranging from MB5233 *Nephtys cirrosa* and *Bathyporeia spp*. in Atlantic infralittoral sand at the nearshore stations to MC6216 Sea pens and burrowing megafauna in Atlantic circalittoral fine mud at the deepest stations.

Report volumes are as follows:

| Report | Report No. |
|---|---|
| Caledonia OWF Array Area Field Report | 54463.E0 |
| Caledonia OWF ECR Field Report | 54463.E1 |
| Caledonia OWF ECR MMO and PAMS Report | 54463.E2 |
| Caledonia OWF Array Area MMO and PAMS Report | 54463.E3 |
| Caledonia OWF Array Area Habitat Assessment Report | 54463.E4 |
| Caledonia OWF Array Area Environmental Baseline Report | 54463.E5 |
| Caledonia OWF ECR Habitat Assessment Report | 54463.E6 |
| Caledonia OWF ECR Environmental Baseline Report | 54463.E7 |

# USE OF THIS REPORT

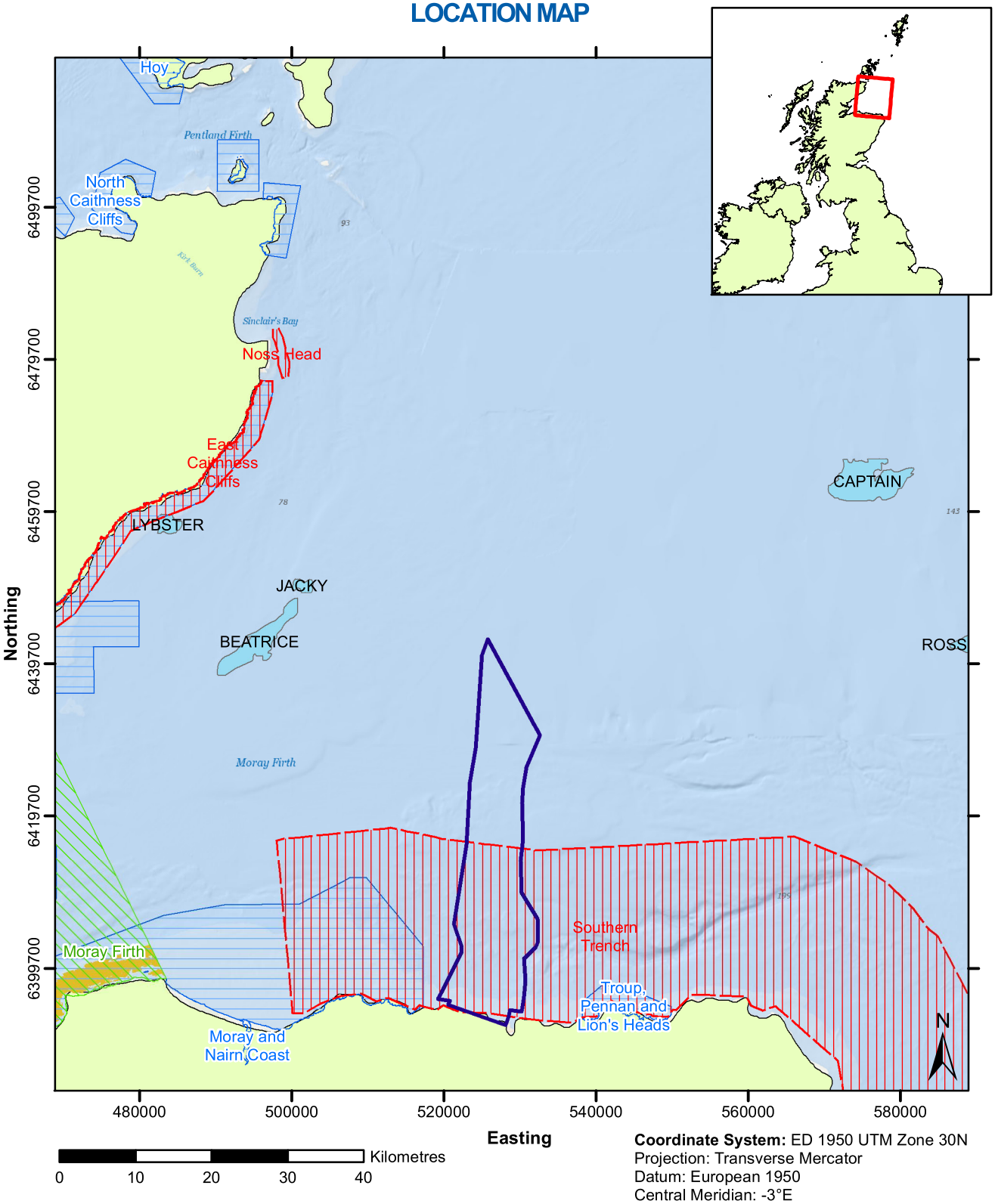
This report has been prepared with due care and diligence and with the skill reasonably expected of a reputable contractor experienced in the types of work carried out under the contract and as such the findings in this report are based on an interpretation of data which is a matter of opinion on which professionals may differ and unless clearly stated is not a recommendation of any course of action.

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## LOCATION MAP




**Coordinate System:** ED 1950 UTM Zone 30N
Projection: Transverse Mercator
Datum: European 1950
Central Meridian: -3°E

**Key**

- Caledonia Offshore Wind Farm Export Cable Route Survey Area
- Nature Conservation Marine Protected Areas (NCMPA; JNCC, 2022)
- Special Area of Conservation (JNCC, 2022)
- Special Protected Area (JNCC, 2022)
- Oil Field (NSTA, 2022)
- Sandy Sediment in less than 20m water (JNCC, 2019)

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# TABLE OF CONTENTS

REPORT AUTHORISATION AND DISTRIBUTION II
EXECUTIVE SUMMARY III
USE OF THIS REPORT V
LOCATION MAP VI
TABLE OF CONTENTS VII
LIST OF FIGURES IX
LIST OF TABLES X
GLOSSARY OF TERMS AND ABBREVIATIONS XI
1 INTRODUCTION 1
1.1 Scope of Work 1
1.2 Environmental Survey Strategy 1
1.3 Published Background Data 10
1.4 Existing Infrastructure 11
2 RESULTS AND DISCUSSION 13
2.1 Geophysical Survey Summary 13
2.2 Seabed Imagery Observations Summary 17
2.3 Water Physico-Chemical Profile 18
2.4 Sediment Sampling Summary 21
2.5 Sediment Characteristics 21
2.6 Hydrocarbon Concentrations 24
2.7 Organotins 31
2.8 Metal Concentrations 31
2.9 Statistical Analysis of Sediment Physico-chemical Results 32
2.10 DNA Metabarcoding Results 36
2.11 Macrofaunal Interpretation 53
2.12 EUNIS Habitat Classification 67
3 CONCLUSION 70
4 BIBLIOGRAPHY 71

APPENDICES

APPENDIX A SCOPE OF WORK
APPENDIX B FIELD SAMPLING LOGS
APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS
APPENDIX D METHODS
APPENDIX E BACKGROUND INFORMATION
APPENDIX F CTD PROFILES
APPENDIX G PARTICLE SIZE ANALYSIS
APPENDIX H SPEARMAN'S RANK CORRELATION
APPENDIX I HYDROCARBON ANALYSIS
APPENDIX J POLYBROMINATED DIPHENYL ETHERS ANALYSIS
APPENDIX K METALS ANALYSIS
APPENDIX L DNA ANALYSIS
APPENDIX M MACROFAUNA ANALYSIS
APPENDIX N BIOMASS ANALYSIS
APPENDIX O EUNIS CLASSIFICATION

# LIST OF FIGURES

Figure 1.1 Target and Actual Sampling Locations; Stations ENV01 to ENV26 5
Figure 1.2 Target and Actual Sampling Locations; Stations ENV27 to ENV42 6
Figure 1.3 Target and Actual Sampling Locations; Stations ENV43 to ENV55 7
Figure 1.4 Target and Actual Sampling Locations; Stations ENV60 to ENV64 8
Figure 1.5 Target and Actual Sampling Locations; Stations ENV56 to ENV59 (Nearshore) 9
Figure 1.6 Local Subsea Infrastructure Features 12
Figure 2.1 Colour Shaded Relief of Bathymetry 15
Figure 2.2 SSS Mosaic Overlaid with Seabed Features 16
Figure 2.3 Sampled Proportion of Fines, Sand and Gravel Across the ECR 23
Figure 2.4 Ratio of 276 Molecular Weight Indices 28
Figure 2.5 Naphthalene and Phenanthrene Parent Versus Alkylated Homologue PAHs 30
Figure 2.6 Multivariate Analyses of the Nine Station Physico-chemical Data Set 34
Figure 2.7 Contributions of Gross Sediment Bacteria OTU Taxonomic Groups by Station 39
Figure 2.8 Contributions of Gross Sediment Infaunal OTU Taxonomic Groups by Station 40
Figure 2.9 Sediment Bacterial Taxonomic Heat Trees of the Number of OTUs 41
Figure 2.10 Sediment Infaunal Taxonomic Heat Trees of the Number of OTUs 41
Figure 2.11 Bacterial OTU Accumulation Curve 42
Figure 2.12 Infaunal OTU Accumulation Curve 42
Figure 2.13 Contributions of Gross Water Fish OTU Taxonomic Families by Station 45
Figure 2.14 Contributions of Gross Water Fish OTU Taxonomic Families by Sample 45
Figure 2.15 Contributions of Gross Water Vertebrate OTU Taxonomic Families by Station 46
Figure 2.16 Contributions of Gross Water Vertebrate OTU Taxonomic Families by Sample 46
Figure 2.17 Water Fish Taxonomic Heat Trees of the Number of OTUs 47
Figure 2.18 Water Vertebrate Taxonomic Heat Trees of the Number of OTUs 47
Figure 2.19 Fish OTU by Sample Accumulation Curve 48
Figure 2.20 Vertebrate OTU by Sample Accumulation Curve 48
Figure 2.21 Multivariate Analysis of Sediment Bacterial OTU Data by Station 50
Figure 2.22 Multivariate Analysis of Water Vertebrate OTU Data by Station 52
Figure 2.23 Contributions of Gross Taxonomic Groups 55
Figure 2.24 Adult Data Set Species Accumulation Curve 57
Figure 2.25 Contributions of Gross Taxonomic Groups by Biomass 59
Figure 2.26 Multivariate Analysis of Abundance Faunal Data 63
Figure 2.27 Multivariate Analysis of Biomass Faunal Data 65

# LIST OF TABLES


| | | |
|---|---|---|
| Table 1.1 | Summary of Environmental Station Target Positions and Data Acquired | 3 |
| Table 1.2 | Details of Historical Wells Within 5km of Environmental Station Targets | 11 |
| Table 2.1 | Summary of Potential Temperature (θ, °C) | 18 |
| Table 2.2 | Summary of Salinity (PSU) | 19 |
| Table 2.3 | Summary of Dissolved Oxygen (mg $L^{-1}$) | 19 |
| Table 2.4 | Summary of Turbidity (FTU) from CTD Upcast Profiles | 20 |
| Table 2.5 | Summary of pH from CTD Upcast Profiles | 20 |
| Table 2.6 | Sediment Characteristics | 22 |
| Table 2.7 | Summary of Sediment Hydrocarbon Analyses | 26 |
| Table 2.8 | n-Alkane Concentrations | 27 |
| Table 2.9 | PAH Concentrations | 29 |
| Table 2.10 | Concentrations of PBDEs | 30 |
| Table 2.11 | Sediment Metal Concentrations | 32 |
| Table 2.12 | Physico-chemical Parameters Influencing SIMPROF Separation in the 9 Station Data Set | 33 |
| Table 2.13 | OTU Sediment Detections per Target and Percentage Successfully Classified | 37 |
| Table 2.14 | Contribution of Gross Sediment Bacterial OTU Taxonomic Groups | 38 |
| Table 2.15 | Contribution of Gross Sediment Infaunal OTU Taxonomic Groups | 38 |
| Table 2.16 | Summary of Sediment (Bacterial and Infaunal) Richness | 41 |
| Table 2.17 | OTU Water Detections per Target and Percentage Successfully Classified | 43 |
| Table 2.18 | Contribution of Gross Water Fish OTU Taxonomic Families | 44 |
| Table 2.19 | Contribution of Gross Water Vertebrate OTU Taxonomic Families | 44 |
| Table 2.20 | Summary of Water (Fish and Vertebrate) Richness | 47 |
| Table 2.21 | Taxa Influencing Sediment Bacteria OTU SIMPROF Variation | 51 |
| Table 2.22 | Contribution of Gross Taxonomic Groups of Adults by Abundance | 54 |
| Table 2.23 | Species Ranking by Abundance | 56 |
| Table 2.24 | Contribution of Gross Taxonomic Groups by Biomass | 57 |
| Table 2.25 | Species Ranking by Biomass of Adult Only Data | 58 |
| Table 2.26 | Faunal Abundance Univariate Statistics | 61 |
| Table 2.27 | Taxa influencing Adult Macrofauna Abundance SIMPROF Variation | 64 |
| Table 2.28 | Taxa Influencing Macrofauna Biomass SIMPROF Variation | 66 |
| Table 2.29 | EUNIS Habitat Classification | 69 |

# GLOSSARY OF TERMS AND ABBREVIATIONS

| | |
|---|---|
| AET | Apparent Effects Threshold |
| Aliphatic | An organic compound having open-chain structure (see Alkane) |
| Alkane | Any of a series of open-chain, saturated hydrocarbons $C_nH_{2n+2}$ (*e.g.* methane, ethane) |
| Anthropogenic | Produced or caused by human activity |
| BAC | Background Assessment Criteria |
| BC(s) | Background Concentration(s) |
| Benthic | Relating to the seabed |
| Biogenic | Produced by living organisms |
| BSI | British Standards Institute |
| CAL | Cefas Action Level |
| CCC | Continuing Calibration Check |
| Cefas | Centre of Environment Fisheries and Aquaculture Science |
| CEMP | Coordinated Environmental Management Programme |
| CHEM | Chemistry Sample |
| Clay | Sediment grains <3.9µm in diameter |
| CM | Central Meridian |
| CPI | Carbon Preference Index |
| CTD | Conductivity, Temperature and Depth Profiler |
| DCM | Dichloromethane |
| DO | Dissolved Oxygen |
| EAC | Environmental Assessment Criteria |
| EBS | Environmental Baseline Survey |
| ECR | Export Cable Route |
| EEA | European Environment Agency |
| ERL | Effects Range Low |
| ERM | Effects Range Median |
| EQR | Ecological Quality Ratio |
| EUNIS | European Union Nature Identification System |
| Fines | Sediment grains <63µm in diameter (same as Mud) |
| FTU | Formazine Turbidity Units |
| GC | Gas Chromatography |
| GC-FID | Gas Chromatography Flame Ionisation Detection |
| GC-MS | Gas Chromatography Mass Spectrometry |
| GC-MS-MS | Triple Quadrupole Mass Spectrometer |
| Gravel | Sediment grains >2mm in diameter |
| HF | Hydrofluoric Acid |
| HMW | High Molecular Weight |
| ICP-MS | Inductively Coupled Plasma Mass Spectrometry |
| IUCN | International Union for Conservation of Nature |
| JNCC | Joint Nature Conservation Committee |
| LAT | Lowest Astronomical Tide |
| LMW | Low Molecular Weight |
| LOD | Limit of Detection |
| Macrofauna | Organisms that are normally larger than the mesh size of the sieve used. Then state the sieve size *e.g.*, "In this case 1mm". |
| MBES | Multi-beam Echo Sounder |
| MDS | Multi Dimensional Scaling |
| Meiofauna | Organisms that are usually smaller than the mesh size of the sieve used. Then state the sieve size *e.g.*, "In this case 1mm". |
| MMO | Marine Management Organisation |
| Mud | Sediment grains <63µm (includes Silt and Clay) |
| MV | Motor Vessel |
| NDIR | Non-dispersive infrared |
| NMBAQC | North East Atlantic Marine Biological Analytical Quality Control |
| NPD | Naphthalenes, phenanthrenes and dibenzothiophenes |
| NSTA | North Sea Transit Authority |
| OCP | Organochlorine Pesticide |
| OSPAR | Oslo and Paris convention |
| OTU | Operational Taxonomic Unit |
| OWF | Offshore Wind Farm |
| PAH(s) | Polycyclic aromatic hydrocarbon(s) |
| PBDE | Polybrominated Diphenyl Ether |
| PCB | Polychlorinated Biphenyl |
| PCR | Polymerase Chain Reaction |
| Petrogenic | Relating to unburned petroleum products |
| PMF | Priority Marine Feature |
| PRIMER | A statistical analysis program - Plymouth Routines in Multivariate Research |
| PSA | Particle Size Analysis |
| PSU | Practical Salinity Units |
| Pyrogenic | Produced under conditions involving intense heat |
| QC | Quality Control |
| SAC | Special Area of Conservation |
| Sand | Sediment grains ≥63µm and <2mm in diameter |
| SD | Standard deviation |
| Silt | Sediment grains ≥3.9µm and <63µm in diameter |
| Sobs | A species accumulation curve with samples added in label order |
| Sorting | Measure of the range of grain sizes in a sediment sample |
| SSS | Side Scan Sonar |
| THC | Total Hydrocarbon |
| TOC | Total Organic Carbon |
| UCM | Unresolved Complex Mixture |
| UGE | A smoothed species accumulation curve based on samples being added randomly and averaged over several runs |
| UKCS | United Kingdom Continental Shelf |
| UKOOA | United Kingdom Offshore Operators Association |
| USBL | Ultra-Short Baseline |
| US EPA | United States Environmental Protection Agency |
| UTM | Universal Transverse Mercator |
| UVF | Ultra-Violet Fluorescence Spectroscopy |

# 1 INTRODUCTION

## 1.1 Scope of Work

Between March and June 2023, Gardline Limited (Gardline) and Titan Environmental Surveys (Titan) conducted an integrated survey on behalf of Calendonia Offshore Wind Farm Limited across the associated export cable routes (ECR) located in the outer regions of the Moray Firth.

The offshore portion of the survey was conducted on the motor vessel (MV) *Ocean Endeavour* between 03-Mar-2023 and 12-Jun-2023, with environmental operations taking place between from 19-Mar-2023 to 14-Apr-2023. The nearshore component of the survey was conducted onboard the MV *Titan Discovery* between 16-Apr-2023 and 06-Jun-2023, with environmental operations taking place from 02-May-2023 to 21-May-2023. The current report details the full environmental baseline survey (EBS) results. Results of the habitat assessment (Gardline, 2023b) and geophysical survey (Gardline, 2023a) are reported separately, with results summarised within this report where relevant.

As detailed in the scope of work (Appendix A), the overall aim of the survey was data collection to support the design of the proposed offshore windfarm infrastructure along the ECR and to continue works undertaken during the Caledonia Reconnaissance Geophysical Survey in 2022. To support the placement and design of proposed offshore subsea facilities within the survey area a multi-discipline survey was required.

The objectives of the environmental survey were:

- characterise the benthic sub-tidal environment that is present across the footprint of the ECR.
- identify the occurrence and distribution of any habitats or species of conservation interest.
- characterise the grain type and levels of contaminants within the seabed sediments.

All positional information in this report is referenced to WGS 1984. All grid coordinates are projected using Universal Transverse Mercator (UTM) Projection Grid Zone 30N, Central Meridian (CM) 3°W.

## 1.2 Environmental Survey Strategy

Details of the station locations are summarised in Table 1.1. Target and actual sampling locations, the latter of which may be slightly offset from the former, are presented in Figure 1.1 to Figure 1.5 and in the Surveyors' log sheets in Appendix B. A selection of photographs from the seabed imagery and of the recovered grab samples is presented in Appendix C. Sampling and analytical methods are detailed in Appendix D.

To enable clear and concise reporting, the naming convention of the stations have been shortened by the removal of the 'ECR_' station identifier. These shortened names have been used throughout the report where possible, though the original full names have been retained in survey logs, the image file names and on the video overlays. The abbreviated station names have been presented in Table 1.1 along with details of grab samples and seabed imagery data acquired.

A total of 64 stations were pre-selected by the client across the ECR to meet the objectives of the SOW (Appendix A). This included 4 stations covering the inshore part of the survey corridor. Of the 64 stations, 24 were camera-only transects focussing on substrates consisting of potential Annex I habitats, with the remaining 40 stations co-located with sediment sampling. Stations ENV38 and ENV39 utilised the C-Technics digital camera system, with the remaining stations investigated with the Kongsberg digital camera. Of the 64 stations investigated with the camera system, imagery from 27 stations was analysed for the occurrence and distribution of any habitats or species of conservation interest and only these camera transects have been plotted in

Figure 1.1 to Figure 1.5. Across the remaining 36 stations, seabed imagery was used for grab sampling pre-clearance purposes only at 34 stations and was of insufficient quality to conduct analysis at the remaining two stations (ENV60 and ENV64).

Benthic sampling was undertaken at 40 stations and other than at Stations ENV20 and ENV32, all were successfully sampled. At Station ENV20, failed sampling attempts due to in the grab sample or pebbles becoming stuck in the grab's jaw leading to sample washout, meant that a full suite of samples was not collected from this station. Similarly, no grab samples were acquired at Station ENV32 due to either low retention in the grab sample or pebbles becoming stuck in the grab's jaw.

Using the 0.1m$^2$ mini-Hamon grab, two macrofaunal samples were acquired. With the exception of Station ENV08, these were sub-sampled for particle size analysis (PSA), prior to being sieved onboard through a 1mm sieve to provide benthic macrofaunal samples, which were preserved in formaldehyde solution. One of the faunal samples (MFA) was processed in the laboratory, with the second sample (MFB) retained at Gardline's premises as a spare. At Station ENV08, following several failed sampling attempts, the PSA sample was acquired through a separate deployment of the grab due to the low sample volume of the MFA and MFB samples. At nine of the stations (as detailed in Table 1.1), sub-samples for environmental DNA (eDNA) analysis were also taken from the fauna samples.

Using the 0.1m$^2$ Day grab for acquisition of chemistry samples at nine of the stations (as detailed in Table 1.1), one sample (designated CHEM) from each station was sub-sampled for analysis of hydrocarbons, metals, organotins, polychlorinated biphenyls (PCBs), polybrominated diphenyl ethers (PBDEs) and organochlorine pesticides (OCPs).

CTD profiles and water sample were also acquired at eight stations (as detailed in Table 1.1). Two water samples, one near the seabed and one below the sea surface, were acquired at each station for eDNA analysis.

Table 1.1 Summary of Environmental Station Target Positions and Data Acquired

| Target ID | Station ID for use in the Report | Start Easting[1] | Start Northing[1] | End Easting[1] | End Northing[1] | Observed Water Depth[2] (m) | Description | Camera[3] | CTD Profile | Failed Sampling Attempts | Fauna[4] | Sediment Sub-samples | | | Water Sub-samples |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | Chemistry[5] | Particle Size[5] | eDNA[5] | eDNA[5] |
| Offshore Stations | | | | | | | | | | | | | | | |
| ECR_ENV_01 | ENV01 | 527 943 | 6 394 888 | | | 35 | High side scan sonar (SSS) reflectivity, sand and slightly gravelly sand, seabed depressions and large sand waves | Y | | 3 | 2 | | 2 | | |
| ECR_ENV_02 | ENV02 | 525 003 | 6 404 670 | | | 88 | General flat seabed, low SSS reflectivity, sandy sediment | Y | | | 2 | | 2 | | |
| ECR_ENV_03 | ENV03 | 527 815 | 6 422 341 | | | 74 | General flat seabed, low SSS reflectivity, sandy sediment | Y | | 1 | 2 | | 2 | | |
| ECR_ENV_04 | ENV04 | 526 524 | 6 410 862 | | | 83 | General flat seabed, low SSS reflectivity, sandy sediment | Y | Y | | 2 | 2 | 2 | 2 | 2 |
| ECR_ENV_05 | ENV05 | 529 726 | 6 431 936 | | | 75 | General flat seabed, low SSS reflectivity, sandy sediment | Y | | 1 | 2 | | 2 | | |
| ECR_ENV_06 | ENV06 | 527 936 | 6 415 791 | | | 71 | General flat seabed, low SSS reflectivity, sandy sediment | Y | | | 2 | | 2 | | |
| ECR_ENV_07 | ENV07 | 523 782 | 6 395 200 | | | 32 | General flat seabed, low SSS reflectivity, sandy sediment | Y | | | 2 | | 2 | | |
| ECR_ENV_08 | ENV08 | 526 625 | 6 398 004 | | | 73 | Edge of gradual slope, low SSS reflectivity, sandy sediment | Y | | 3 | 2 | | 2[6] | | |
| ECR_ENV_09 | ENV09 | 524 422 | 6 407 875 | | | 87 | General flat seabed, low SSS reflectivity, sandy sediment | Y | | | 2 | | 2 | | |
| ECR_ENV_10 | ENV10 | 526 895 | 6 427 550 | | | 78 | General flat seabed, low SSS reflectivity, sandy sediment | Y | | | 2 | | 2 | | |
| ECR_ENV_11 | ENV11 | 527 403 | 6 419 346 | | | 68 | Area of medium to high SSS reflectivity, mixed sediment, some seabed depressions | Y | | 4 | 2 | | 2 | | |
| ECR_ENV_12 | ENV12 | 527 238 | 6 406 199 | | | 90 | General flat seabed, low SSS reflectivity, sandy sediment | Y | | | 2 | | 2 | | |
| ECR_ENV_13 | ENV13 | 525 888 | 6 415 996 | | | 63 | General flat seabed, low SSS reflectivity, sandy sediment | Y | Y | | 2 | 2 | 2 | 2 | 2 |
| ECR_ENV_14 | ENV14 | 528 139 | 6 404 768 | | | 69 | Top of large seabed outcrop, shows medium SSS reflectivity, sandy/mixed sediment | Y | | 4 | 2 | | 2 | | |
| ECR_ENV_15 | ENV15 | 524 539 | 6 397 554 | | | 52 | Top of large sand wave, indicates a transition area between low and high SSS reflectivity, mixed sediment, slight seabed elevation | Y | | | 2 | | 2 | | |
| ECR_ENV_16 | ENV16 | 525 425 | 6 395 985 | | | 40 | General flat seabed, low SSS reflectivity, sandy sediment | Y | | | 2 | | 2 | | |
| ECR_ENV_17 | ENV17 | 525 686 | 6 399 992 | | | 75 | General flat seabed, low SSS reflectivity, sandy sediment | Y | Y | | 2 | 2 | 2 | 2 | 2 |
| ECR_ENV_18 | ENV18 | 529 459 | 6 435 225 | | | 69 | Transition between low and high SSS reflectivity, mixed sediment | Y | | | 2 | | 2 | | |
| ECR_ENV_19 | ENV19 | 526 293 | 6 412 287 | | | 79 | General flat seabed,  low SSS reflectivity, sandy sediment | Y | | | 2 | | 2 | | |
| ECR_ENV_20 | ENV20 | 522 015 | 6 396 359 | | | 32 | Potential rock outcrop, High SSS reflectivity, sandy/gravel sediment, possible reef structure | Y | | 4 | 2 | | 0 | | |
| ECR_ENV_21 | ENV21 | 528 145 | 6 396 764 | | | 48 | General flat seabed, medium SSS reflectivity, sandy/gravel sediment | Y | | 1 | 2 | | 2 | | |
| ECR_ENV_22 | ENV22 | 526 407 | 6 421 398 | | | 64 | Medium SSS reflectivity, mixed sediment, seabed elevation, mega ripples | Y | | | 2 | | 2 | | |
| ECR_ENV_23 | ENV23 | 526 710 | 6 414 359 | | | 74 | General flat seabed, low SSS reflectivity, sandy sediment | Y | | | 2 | | 2 | | |
| ECR_ENV_24 | ENV24 | 526 032 | 6 407 680 | | | 92 | General flat seabed, low SSS reflectivity, sandy sediment | Y | | | 2 | | 2 | | |
| ECR_ENV_25 | ENV25 | 528 441 | 6 398 316 | | | 75 | General flat seabed, low SSS reflectivity, sandy sediment | Y | | 1 | 2 | | 2 | | |
| ECR_ENV_26 | ENV26 | 528 618 | 6 402 532 | | | 110 | Bottom of trench, low SSS reflectivity, sandy sediment | Y | Y | | 2 | 2 | 2 | 2 | 2 |
| ECR_ENV_27 | ENV27 | 527 955 | 6 408 300 | | | 90 | General flat seabed, low SSS reflectivity, sandy sediment | Y | | | 2 | | 2 | | |
| ECR_ENV_28 | ENV28 | 527 328 | 6 425 044 | | | 78 | General flat seabed, low SSS reflectivity, sandy sediment | Y | | | 2 | | 2 | | |
| ECR_ENV_29 | ENV29 | 526 548 | 6 423 621 | | | 83 | Bottom of shoaling seabed, low SSS reflectivity, sandy sediment | Y | Y | | 2 | 2 | 2 | 2 | 2 |
| ECR_ENV_30 | ENV30 | 527 788 | 6 431 898 | | | 74 | General flat seabed, low SSS reflectivity, sandy sediment | Y | | 1 | 2 | | 2 | | |
| ECR_ENV_31 | ENV31 | 529 151 | 6 429 215 | | | 76 | General flat seabed, low SSS reflectivity, sandy sediment | Y | Y | 1 | 2 | 2 | 2 | 2 | 2 |
| ECR_ENV_32 | ENV32 | 525 129 | 6 418 432 | | | 62 | Slope of seabed outcrop, low to high SSS reflectivity, sandy/gravel sediment | Y | | 6 | 0 | | 0 | | |
| ECR_ENV_33 | ENV33 | 527 780 | 6 399 737 | | | 92 | General flat seabed, low SSS reflectivity, sandy sediment | Y | | 2 | 2 | | 2 | | |
| ECR_ENV_34 | ENV34 | 526 390 | 6 430 516 | | | 76 | General flat seabed, low SSS reflectivity, sandy sediment | Y | | | 2 | | 2 | | |
| ECR_ENV_35 | ENV35 | 528 927 | 6 405 414 | | | 78 | General flat seabed, low SSS reflectivity, sandy sediment | Y | | | 2 | | 2 | | |

| Target ID | Station ID for use in the Report | Start Easting[1] | Start Northing[1] | End Easting[1] | End Northing[1] | Observed Water Depth[2] (m) | Description | Camera[3] | CTD Profile | Failed Sampling Attempts | Fauna[4] | Sediment Sub-samples | | | Water Sub-samples |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | Chemistry[5] | Particle Size[5] | eDNA[5] | eDNA[5] |
| ECR_ENV_36 | ENV36 | 527 614 | 6 435 820 | | | 73 | General flat seabed, low SSS reflectivity, sandy sediment | Y | Y | 1 | 2 | 2 | 2 | 2 | 2 |
| ECR_ENV_37 | ENV37 | 526 607 | 6 399 300 | 526 580 | 6 399 341 | 75 | General flat seabed, low SSS reflectivity, sandy sediment | Y | | | | | | | |
| ECR_ENV_38 | ENV38 | 523 646 | 6 398 992 | 523 620 | 6 399 028 | 60 | General flat seabed, low SSS reflectivity, sandy sediment | Y | | | | | | | |
| ECR_ENV_39 | ENV39 | 523 566 | 6 396 273 | 523 550 | 6 396 320 | 40 | General flat seabed, high SSS reflectivity, sandy/gravel sediment | Y | | | | | | | |
| ECR_ENV_40 | ENV40 | 527 687 | 6 437 681 | 527 728 | 6 437 665 | 69 | General flat seabed, low SSS reflectivity, sandy sediment | Y | | | | | | | |
| ECR_ENV_41 | ENV41 | 529 600 | 6 430 646 | 529 638 | 6 430 651 | 74 | General flat seabed, low SSS reflectivity, sandy sediment | Y | | | | | | | |
| ECR_ENV_42 | ENV42 | 526 559 | 6 425 774 | 526 595 | 6 425 780 | 78 | General flat seabed, low SSS reflectivity, sandy sediment | Y | | | | | | | |
| ECR_ENV_43 | ENV43 | 526 959 | 6 417 301 | 527 000 | 6 417 289 | 64 | General flat seabed, high SSS reflectivity, sandy/gravel sediment | Y | | | | | | | |
| ECR_ENV_44 | ENV44 | 525 589 | 6 411 512 | 525 640 | 6 411 514 | 77 | General flat seabed, low SSS reflectivity, sandy sediment | Y | | | | | | | |
| ECR_ENV_45 | ENV45 | 527 524 | 6 410 067 | 527 574 | 6 410 062 | 83 | General flat seabed, low SSS reflectivity, sandy sediment | Y | | | | | | | |
| ECR_ENV_46 | ENV46 | 524 818 | 6 408 957 | 524 868 | 6 408 955 | 86 | General flat seabed, low SSS reflectivity, sandy sediment | Y | | | | | | | |
| ECR_ENV_47 | ENV47 | 525 217 | 6 406 950 | 525 218 | 6 406 904 | 86 | General flat seabed, low SSS reflectivity, sandy sediment | Y | | | | | | | |
| ECR_ENV_48 | ENV48 | 528 397 | 6 406 983 | 528 349 | 6 406 985 | 95 | General flat seabed, low SSS reflectivity, sandy sediment | Y | | | | | | | |
| ECR_ENV_49 | ENV49 | 526 330 | 6 405 008 | 526 285 | 6 404 996 | 71 | General flat seabed, low SSS reflectivity, sandy sediment | Y | | | | | | | |
| ECR_ENV_50 | ENV50 | 529 508 | 6 403 681 | 529 558 | 6 403 686 | 98 | General flat seabed, low SSS reflectivity, sandy sediment | Y | | | | | | | |
| ECR_ENV_51 | ENV51 | 527 934 | 6 400 689 | 527 932 | 6 400 736 | 98 | General flat seabed, low SSS reflectivity, sandy sediment | Y | | | | | | | |
| ECR_ENV_52 | ENV52 | 525 152 | 6 402 576 | 525 148 | 6 402 622 | 93 | General flat seabed, low SSS reflectivity, sandy sediment | Y | | | | | | | |
| ECR_ENV_53 | ENV53 | 525 615 | 6 394 765 | | | 31 | Transition between low and high SSS reflectivity, mixed sediment and potential rocky outcrops | Y | Y | | 2 | 2 | 2 | 2 | 2 |
| ECR_ENV_54 | ENV54 | 528 222 | 6 399 816 | 528 225 | 6 399 773 | 97 | Large seabed depression with high SSS reflectivity centre | Y | | | | | | | |
| ECR_ENV_55 | ENV55 | 526 580 | 6 402 950 | 526 550 | 6 402 913 | 108 | Large seabed depression with high SSS reflectivity centre | Y | | | | | | | |
| ECR_ENV_60 | ENV60 | 522 606 | 6 397 249 | 522 612 | 6 397 102 | 39 | Mottled SSS reflectivity with slight/ low bathymetric changes | Y | | | | | | | |
| ECR_ENV_61 | ENV61 | 523 342 | 6 398 248 | 523 384 | 6 398 133 | 50 | Mottled SSS reflectivity with slight/ low bathymetric changes. | Y | | | | | | | |
| ECR_ENV_62 | ENV62 | 524 127 | 6 397 212 | 521 136 | 6 397 036 | 46 | Higher SSS reflectivity area. | Y | | | | | | | |
| ECR_ENV_63 | ENV63 | 525 787 | 6 420 121 | 525 918 | 6 420 064 | 60 | Bathymetric feature with higher SSS reflectivity | Y | | | | | | | |
| ECR_ENV_64 | ENV64 | 525 504 | 6 419 160 | 525 486 | 6 419 034 | 65 | Bathymetric feature with mottled higher SSS reflectivity | Y | | | | | | | |
| Nearshore Stations | | | | | | | | | | | | | | | |
| ECR_ENV_56 | ENV56 | 526 019 | 6 393 557 | NA | NA | NA | Adjusted to target rocky area | Y | | | | | | | |
| ECR_ENV_57 | ENV57 | 527 011 | 6 392 977 | NA | NA | 13 | Client specified | Y | | 2 | 2 | | 2 | | |
| ECR_ENV_58 | ENV58 | 523 103 | 6 394 101 | NA | NA | 20 | Client specified | Y | | 4 | 2 | 2 | 2 | | |
| ECR_ENV_59 | ENV59 | 521 403 | 6 395 099 | NA | NA | 29 | Client specified | Y | | 1 | 2 | | 2 | | |
| | | | | | | | **Total Stations Investigated** | **64** | **8** | **17** | **40** | **9** | **40** | **8** | **8** |
| | | | | | | | **Total Stations Analysed** | **27** | **8** | **17** | **39** | **9** | **38** | **8** | **8** |

1 Environmental target locations. Actual sampling positions for each individual grab sample are detailed in Appendix B.
2 Actual depth at time of sampling, not corrected to lowest astronomical tide (LAT)
3 Stations investigated with the camera system but not analysed only are greyed out and not plotted in Figure 1.1 to Figure 1.5.
4 PSA sub-sample removed prior to sieving through a 1mm mesh sieve. One macrofauna sample was sent to be analysed, one sample kept as a spare at room temperature. Analysis methods are as detailed in Appendix D.
5 Each sub-sample comprises one to be analysed and one to be retained as a spare. Analysis methods are as detailed in Appendix D.
6 PSA sample at Station ENV08 was taken from a separate deployment of the grab. At all other stations, PSA was taken from the fauna samples.

Figure 1.1 Target and Actual Sampling Locations; Stations ENV01 to ENV26

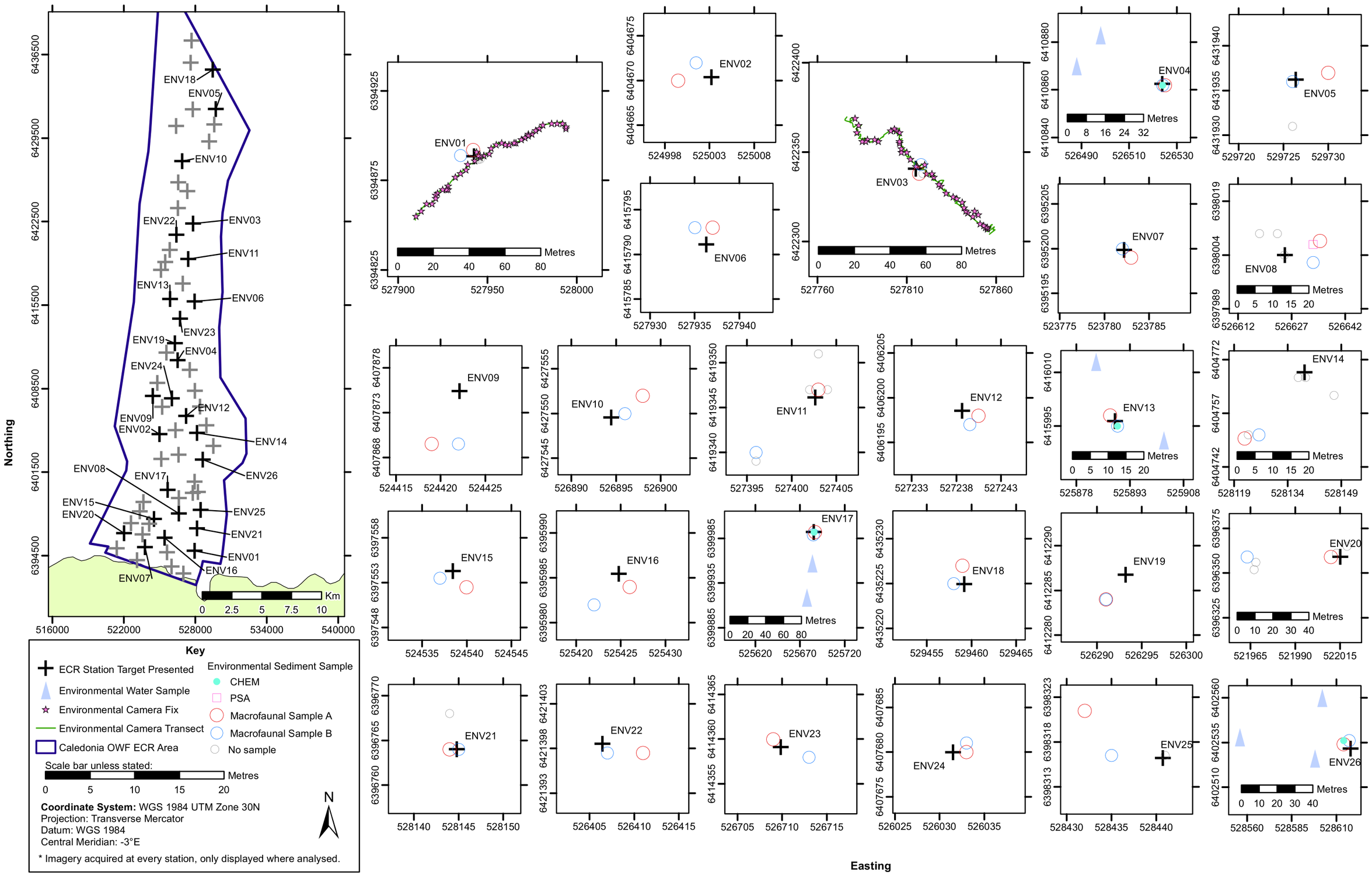


Figure 1.2 Target and Actual Sampling Locations; Stations ENV27 to ENV42

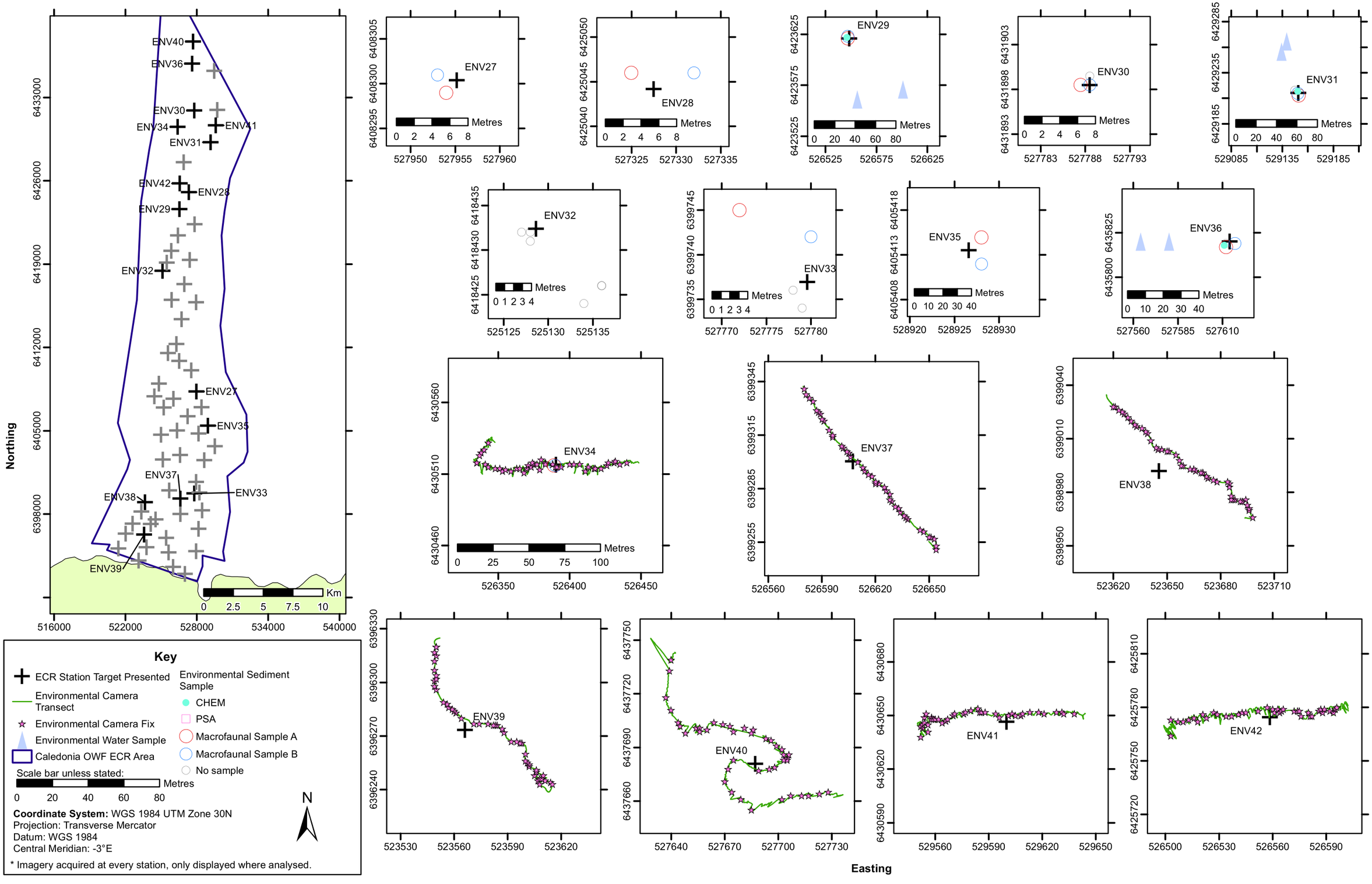


Figure 1.3 Target and Actual Sampling Locations; Stations ENV43 to ENV55

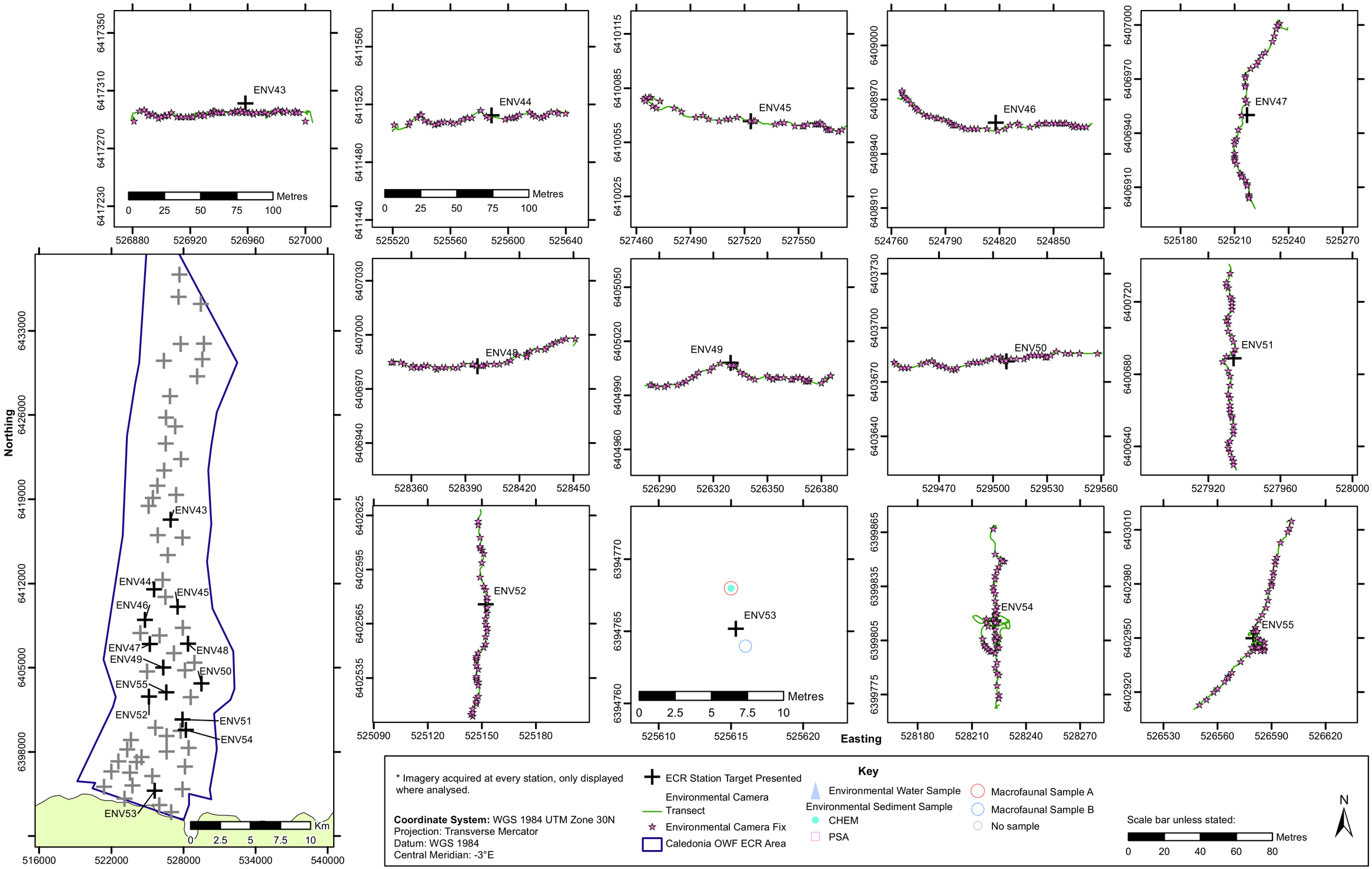
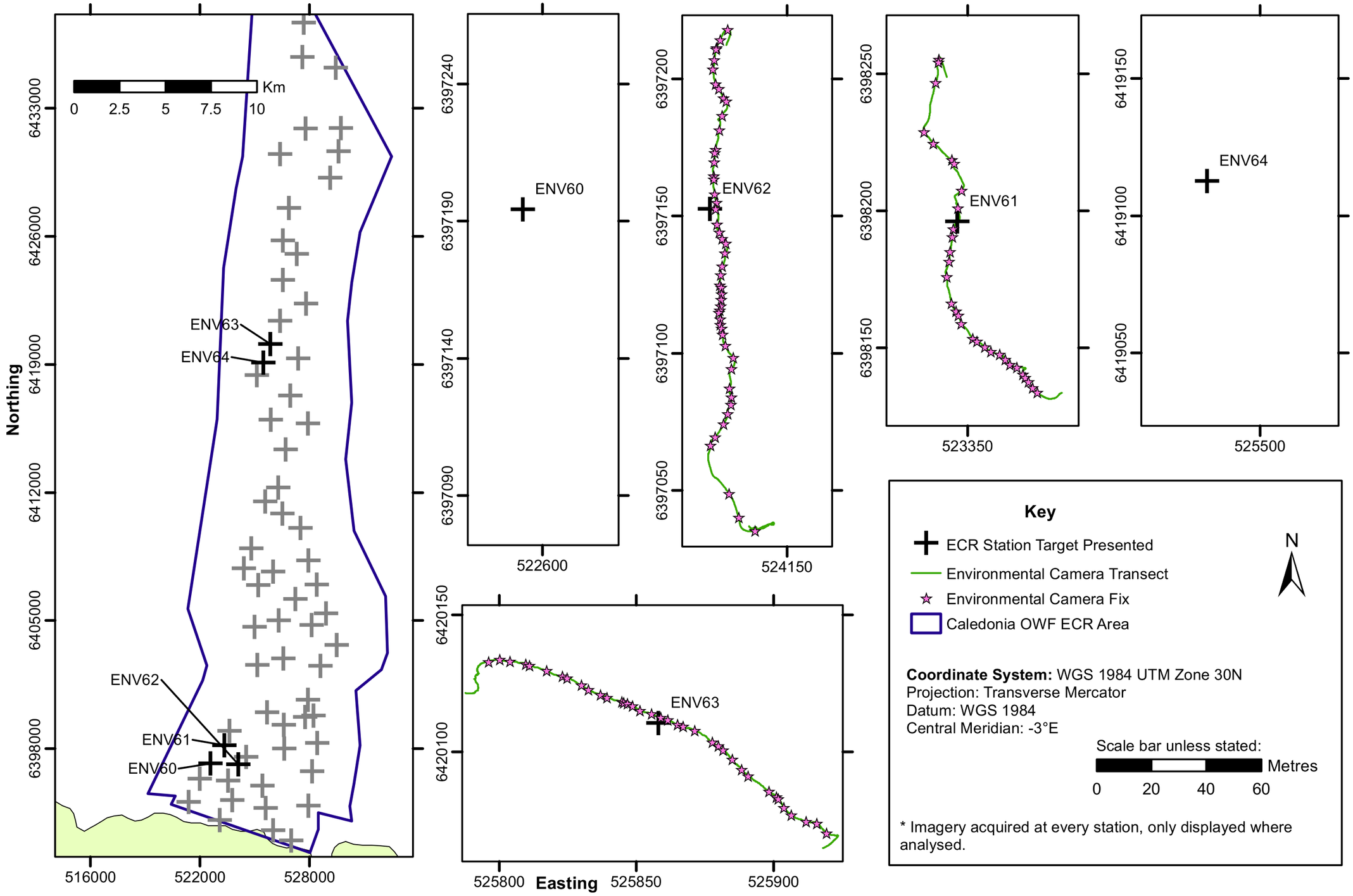
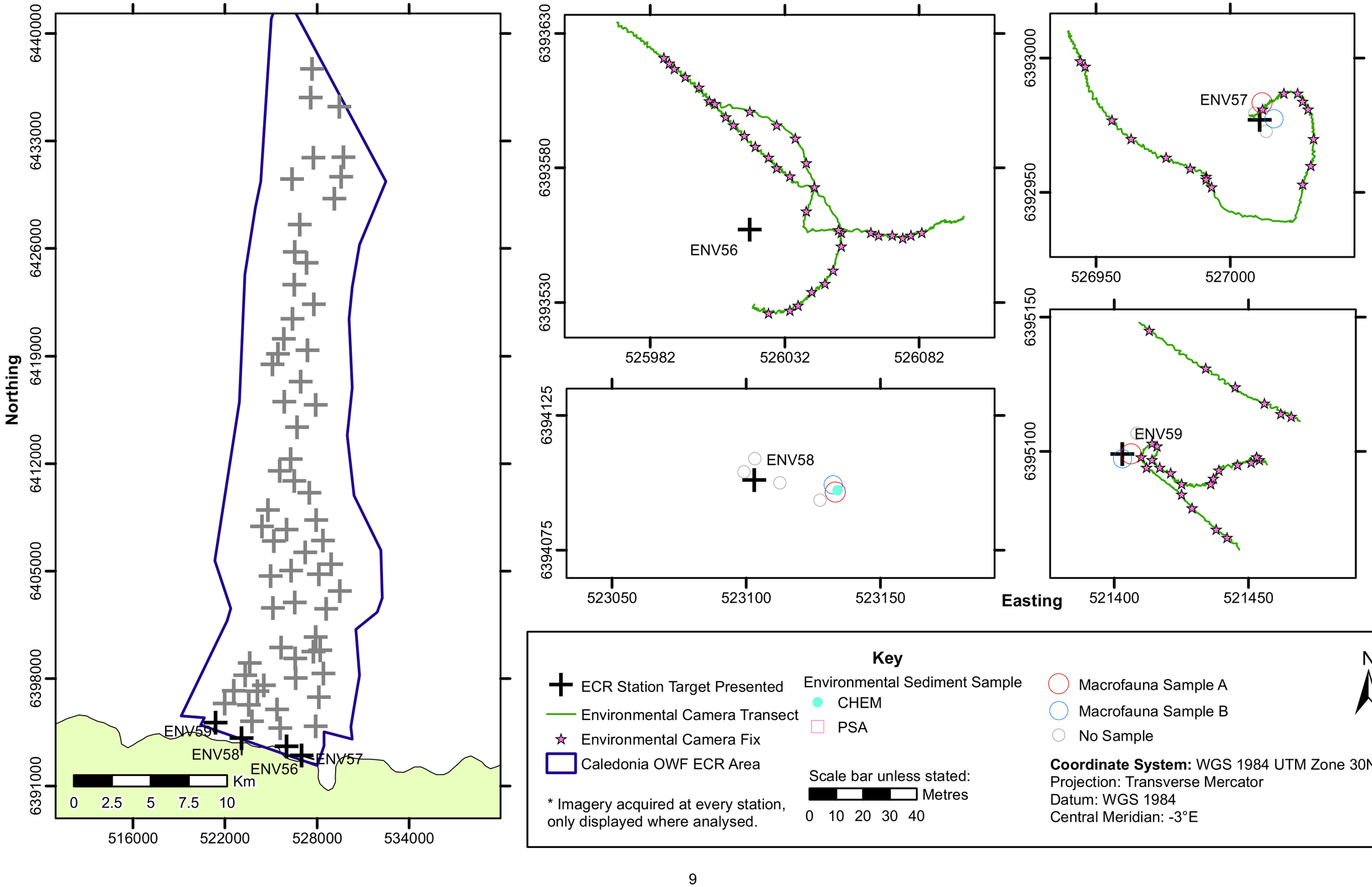


Figure 1.4 Target and Actual Sampling Locations; Stations ENV60 to ENV64



## Figure 1.5 Target and Actual Sampling Locations; Stations ENV56 to ENV59 (Nearshore)



## 1.3 Published Background Data

Reference, where possible, has been made to suitable published background data for marine sediments from the North-East Atlantic and North Sea such as Cefas Action Levels (CALs; MMO, 2022) and OSPAR (2005), along with toxicity information including effects range low (ERL) and effects range median (ERM; Long *et al.*, 1995) and the apparent effects thresholds (AETs) as detailed by Buchman (2008). Background information is also provided in Appendix E.

The MMO (2022) CALs are used to assess dredging material and its suitability for disposal at sea. The values can be used in conjunction with other assessment methods to monitor the contaminant levels of metals, organotins, PCBs and OCPs. In general, contaminant levels in dredged material below CAL1 are of no concern and are unlikely to influence the licencing decision. Dredged material with contaminant levels between CAL1 and CAL2 would require further consideration and testing before a decision can be made. Dredged material with contaminant levels above CAL2 is generally considered unsuitable for sea disposal.

OSPAR (2005) has published a set of background concentrations (BC), which represent the concentrations of certain hazardous substances that would be expected in the North-East Atlantic if certain industrial developments had not happened. OSPAR has also described 'background assessment criteria' (BACs), a set of statistical tools that enable testing of whether mean observed concentrations (*i.e.*, collected during a seabed survey) can be considered to be near background concentrations. Where no updated BCs have been developed, the upper limit of the range of background/reference concentrations (BRC) agreed by OSPAR in 1997 have been used. Comparison to OSPAR (2005) data required normalisation of the hydrocarbon concentrations to 2.5% total organic content (TOC). However, OSPAR (2015) acknowledge that the current BC and BAC may be inappropriate for application throughout the Convention area, as they were derived from a data set that emphasises the northern part of the Convention area and within other areas there may be differences in origin and composition of the sediment. In particular, OSPAR (2015) point out that if the composition of the sampled sediments is very different to the sediment type defined for the assessment criteria, normalisation will require a large extrapolation and may cause an unacceptable uncertainty. As such, where OSPAR (2005) BC, BAC and BRC values are compared with predominantly sandy or coarse sediments, particularly in the southern part of the convention area, interpretation should be treated with some caution.

The best estimates of the potential toxicity of polyaromatic hydrocarbons (PAHs) in marine sediments are ERL and ERM concentrations for total low molecular weight (2- to 3-ring, LMW), total high molecular weight (4- to 6-ring, HMW) and total 2-6 ring PAHs (Neff, 2004) as given by Long *et al.* (1995) and OSPAR (2009c). These concentrations are not actual thresholds of toxicity but delineate concentration ranges with associated probabilities of toxicity. More information on the ERL and ERM for PAHs can be found in Appendix Section E.2. Long *et al.* (1995) also define ERL and ERM values for selected metals.

OSPAR have also defined Environmental Assessment Criteria (EAC) for PAHs, PCBs and the metals cadmium (Cd), lead (Pb) and zinc (Zn) as part of their Coordinated Environmental Management Programme (CEMP; OSPAR, 2009c). EACs represent the contaminant concentration in the environment below which no chronic effects are expected to occur in marine species, including the most sensitive species. Therefore, concentrations below the EACs are considered to present no significant risk to the environment. EACs for a range of contaminants were proposed in 2004, and updated EACs for PCBs were proposed in 2008. Further EACs continue to be developed for use in data assessments. Comparison with EACs required normalisation of PAH and PCB concentrations to 2.5% TOC and metals to 1% TOC. Where EACs are not available, OSPAR instead advise using the aforementioned ERL and ERM values.

Buchman's (2008) AETs were obtained by establishing relationships between the sediment metal concentrations and benthic community toxicological impacts and correspond to the highest concentrations at which no toxicological effects were observed.

## 1.4 Existing Infrastructure

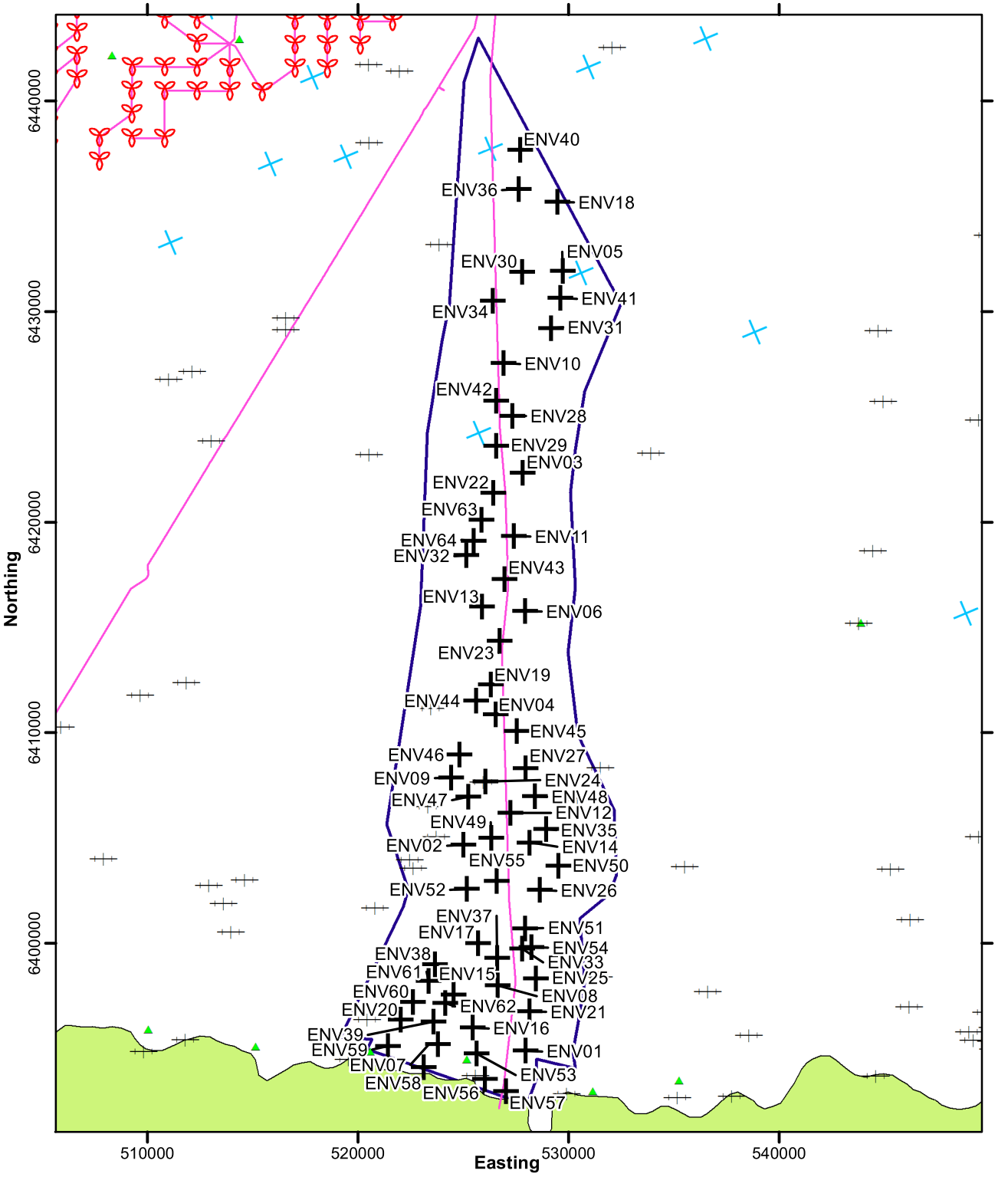
Based on data from the North Sea Transit Authority (NSTA, 2023), the position and status of the three wells within 5km of the environmental station targets are listed in Table 1.2. There were no pipelines in the vicinity of the survey area. An overview of all existing infrastructure relative to the stations is illustrated in Figure 1.6.

Table 1.2 Details of Historical Wells Within 5km of Environmental Station Targets

| Well | Easting | Northing | Status | Intent | Completion Date | Distance and Direction from Nearest Station |
|---|---|---|---|---|---|---|
| 12/28-2 | 530597 | 6431851 | Abandoned Phase 3 | Exploration | 10-Aug-1984 | 875m E of ENV05 |
| 18/03-1 | 525745 | 6424235 | Abandoned Phase 3 | Exploration | 30-Jul-1992 | 1011m NW of ENV29 |
| 12/28-3 | 526301 | 6437741 | Abandoned Phase 3 | Exploration | 03-Sep-1984 | 1387m W of ENV40 |

| <1km | 1-2km | 2-3km | 3-4km | 4-5km |
|---|---|---|---|---|

## Figure 1.6 Local Subsea Infrastructure Features



# 2 RESULTS AND DISCUSSION

## 2.1 Geophysical Survey Summary

### 2.1.1 Survey Overview

Geophysical survey data were successfully acquired across the export cable route. Acquisition comprised data from multi-beam echo sounder (MBES), side scan sonar (SSS), magnetometer, hull-mounted pinger, ultra-short baseline (USBL) positioning beacons and single channel high resolution seismic (S-UHRS) equipment. The data are reported separately in the geophysical interpretation report (Gardline, 2023a).

For the export cable route survey, the main line spacing was 100m and cross line spacing was 500m filling the entire corridor which ranged from 3km to 6km in width. The MV *Titan Discovery* completed all acquisition of the export cable route in water depths less than 25m.

### 2.1.2 Bathymetry

Bathymetry data, gridded at 2m, is illustrated as a colour shaded relief image in Figure 2.1.

Water depth across the ECR varied between 0.3m LAT in the south as the ECR approaches the shore to 109.0m LAT in the southeast, *c.*10km from shore and varying with an average gradient of less than 1°. In the south of the ECR, prominent north to south orientated ridges with localised gradients up to 70°, are interpreted as outcropping bedrock.

In the central part of the ECR, east to west orientated trenches are interpreted as furrows, with measured depths of less than 1m below the surrounding seabed and gradients up to 5° on the flanks. Ripples, with north to south orientated crests, were seen within the furrows with wavelengths of approximately 1m, and heights of less than 0.1m. Gradients associated with the ripples were negligible.

### 2.1.3 Seabed Features

The SSS mosaic, overlaid with interpreted seabed features, is presented in Figure 2.2. Seabed sediments were interpreted to comprise predominantly sand with areas of slightly gravelly sand and slightly gravelly clayey sand.

Areas of relatively low SSS reflectivity were interpreted as Holocene sand.

Areas of relatively high SSS reflectivity, largely associated with bathymetric lows within furrows in the central portion of the ECR, were interpreted as slightly gravelly sand, representing outcropping Unit 2 (Glaciomarine Sands and Clays).

Areas of high SSS reflectively in the central and southern portions of the ECR, largely associated with bathymetric highs, are interpreted as slightly gravelly clayey sand, representing outcropping Unit 3 (Glacial Till) These areas were also characterized by numerous large boulders as seen on the SSS and MBES data.

Well defined areas of chaotic high SSS reflectivity in the southern nearshore section of the ECR associated with bathymetric highs, locally steep gradients and north to south trending ridges are interpreted as conglomerate outcrop (Unit 5).

Numerous contacts were observed on the SSS data, the majority of which were interpreted as boulders. These were concentrated in boulder fields within bathymetry highs associated with where underlying Glacial Till (Unit 3) was at or near the seabed.

The Moray Firth Eastern Development Area 1, 2 and 3 Export Cables run through the southern ~9km of the ECR from the west to the south. The SSS and MBES data confirmed that the cables are trenched in the north with areas of partially infilled trench to the central south section. The cables are intermittently covered by areas of rock dump up to 2.5m high towards the south before the cable is buried and not seen.

The UK Oil and Gas database indicates that two wells are present within the OECR survey area, both of which are located within areas of data coverage.

An area of marginally higher SSS reflectivity was present over Well 18/03-1; where a small mound approximately 0.2m high was seen on the MBES data. Well 12/28-2 was not identified on the SSS or the MBES data; however, multiple magnetic anomalies were associated.

Figure 2.1 Colour Shaded Relief of Bathymetry

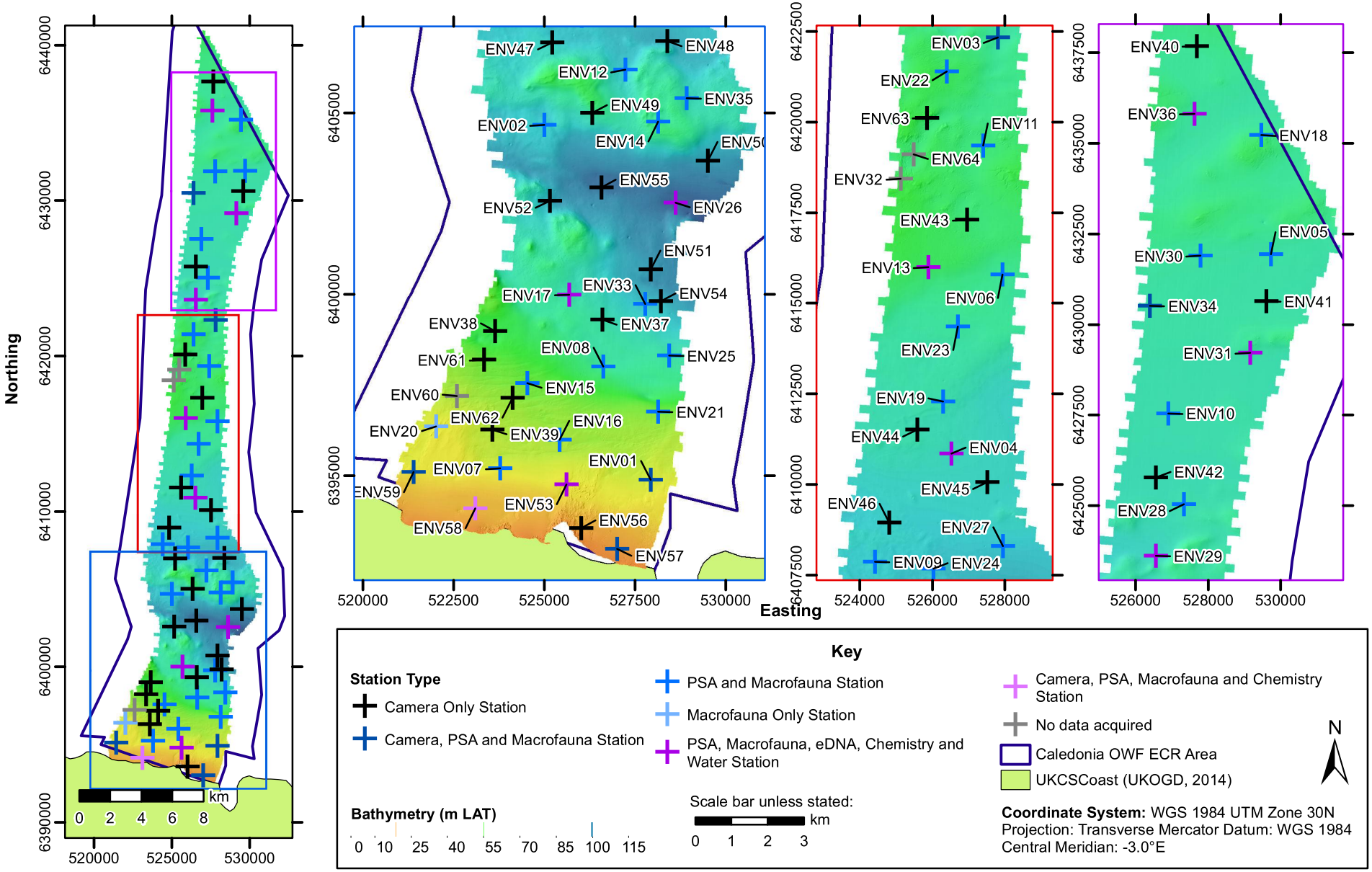
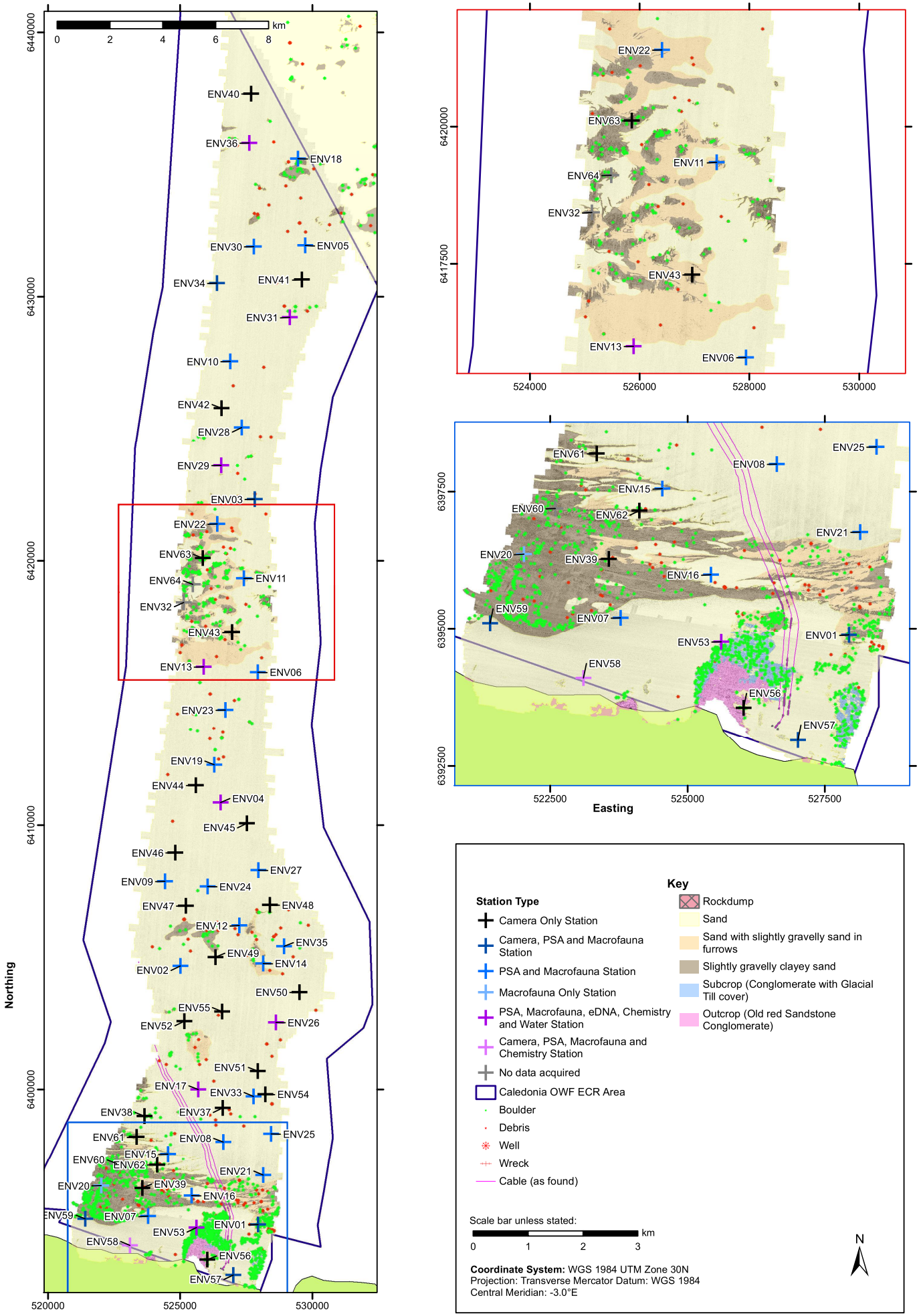


Figure 2.2 SSS Mosaic Overlaid with Seabed Features



## 2.2 Seabed Imagery Observations Summary

The results of the camera investigation at the 27 analysed stations (see Section 1.2) are summarised below and presented in full in the habitat assessment report (Gardline, 2023b). A selection of seabed images, together with sediment and faunal descriptions are presented in Appendix C.

Imagery confirmed the sediments ranged from muddy fine to coarse sand with varying amounts of gravel and shell fragments. Fauna was generally sparse, with 52% (n=567) of images containing no visible fauna. Of all taxa and features observed in imagery, burrows were the most common, identified in 54% (n=591) of images.

Evidence of faunal burrows and/or sea pens was observed at 20 of the 27 stations. The analysis of the SACFOR densities against JNCC (2014) criteria indicated some similarity to a 'sea pen and burrowing megafauna communities' habitat as defined by OSPAR (2010) which is classified as a threatened and/or declining habitat (OSPAR, 2008) and a PMF in Scotland's seas (NatureScot, 2020b).

Potential rocky reef was observed at seven stations along the ECR. The analysis of the resemblance to the Irving (2009) assessment criteria indicated low resemblance to stony reef at Station ENV01 and medium resemblance to stony reef at Stations ENV56 and ENV63. This habitat is listed under Annex I of the Habitats Directive (1992) for protection within Special Areas of Conservation (SAC).

There were observations of the bivalve mollusc *Arctica islandica* in the form of siphons. This species is on the OSPAR (2008) list of threatened and/or declining species and habitat and is listed as a low or limited mobility species PMF in Scottish offshore waters (NatureScot, 2020a).

Two individuals of the flatfish *Glyptocephalus cynoglossus* were observed at Station ENV43. This species is listed as vulnerable globally on the IUCN Red List (2023).

Other than those habitats and species detailed above, there was no further evidence from seabed imagery of any other habitats or species of conservation focus within the ECR survey area.

## 2.3 Water Physico-Chemical Profile

Water CTD profiles were acquired at eight stations. The upcast profiles used in the following analysis of the different physico-chemical variables are presented graphically in Appendix F. Depth profiles for temperature (°C), salinity (practical salinity units; PSU), turbidity (formazin turbidity units; FTU), dissolved oxygen (DO) and pH were recorded against depth on each deployment. Observed temperature has been converted to potential temperature (θ) using UNESCO algorithms (Fofonoff & Millard, 1983), while DO concentration was calculated from the percentage saturation using the formula from Weiss (1970).

### 2.3.1 Potential Temperature

To aid comparison between different profiled stations, a summary of potential temperature (θ, °C) measurements is tabulated in Table 2.1 for specific depth horizons. The potential temperature profiles revealed that the surface temperatures generally increased with distance from shore from 6.9°C at Stations ENV17 and ENV53 to 8.1°C at Station ENV36. Stations ENV04, ENV29, ENV31 and ENV36 showed the clearest thermoclines at depths ranging from *c.*10 to 15m, whereas nearshore Station ENV53 recorded a well-mixed profile throughout.

Beyond depths of 30m, the temperature range across all offshore stations narrowed to within 0.5°C of each other, and remained relatively stable beyond 40m depth, ranging from 7.2°C to 7.6°C at 50m depth, with temperatures generally higher further from shore.

Table 2.1 Summary of Potential Temperature (θ, °C)

| Station[1] | Range (θ, °C) | | | θ (°C) at Specific Depth | | | Station Depth (m LAT) |
|---|---|---|---|---|---|---|---|
| | Min | Max | Surface | 25m | 50m | Max Depth | |
| ENV53 | 6.9 | 6.9 | 6.9 | NA | NA | 6.9 | 28 |
| ENV17 | 6.9 | 7.3 | 6.9 | 7.2 | 7.2 | 7.2 | 73 |
| ENV26 | 7.0 | 7.3 | 7.1 | 7.3 | 7.3 | 7.3 | 109 |
| ENV04 | 7.3 | 7.5 | 7.5 | 7.3 | 7.3 | 7.3 | 81 |
| ENV13 | 7.2 | 7.5 | 7.4 | 7.3 | 7.2 | 7.2 | 62 |
| ENV29 | 7.4 | 8.3 | 8.2 | 7.6 | 7.5 | 7.4 | 81 |
| ENV31 | 7.4 | 7.8 | 7.8 | 7.6 | 7.4 | 7.4 | 73 |
| ENV36 | 7.5 | 8.1 | 8.0 | 7.6 | 7.6 | 7.5 | 71 |

1 Stations are listed in order of distance from shore, from closest to furthest.
NA indicates the CTD maximum depth at this station was shallower than the specific depth; therefore, no value was recorded for this depth.

### 2.3.2 Salinity

A summary of salinity values in PSU is tabulated in Table 2.2. Between stations, salinity varied from 33.7 PSU to 34.8 PSU. All stations recorded slightly decreased salinity in the surface waters except for Station ENV53 which showed a consistent salinity throughout its well mixed profile. Reduced salinity in surface waters and development of a halocline is consistent with the surface freshwater input from the river catchments of the Inner Moray and Cromarty Firths which flow into the Moray Firth.

Table 2.2 Summary of Salinity (PSU)

| Station[1] | Range of Salinity (PSU) | | | Salinity (PSU) at Specific Depth | | |
|---|---|---|---|---|---|---|
| | Min | Max | Surface | 25m | 50m | Max Depth |
| ENV53 | 34.4 | 34.4 | 34.4 | NA | NA | 34.4 |
| ENV17 | 34.1 | 34.5 | 34.1 | 34.5 | 34.5 | 34.5 |
| ENV26 | 34.2 | 34.5 | 34.2 | 34.5 | 34.5 | 34.5 |
| ENV04 | 34.0 | 34.6 | 34.0 | 34.5 | 34.6 | 34.6 |
| ENV13 | 34.3 | 34.5 | 34.3 | 34.4 | 34.5 | 34.5 |
| ENV29 | 33.7 | 34.7 | 33.8 | 34.6 | 34.6 | 34.7 |
| ENV31 | 34.1 | 34.6 | 34.2 | 34.4 | 34.6 | 34.6 |
| ENV36 | 34.4 | 34.8 | 34.4 | 34.6 | 34.6 | 34.8 |

1 Stations are listed in order of distance from shore, from closest to furthest.
NA indicates the CTD maximum depth at this station was shallower than the specific depth; therefore, no value was recorded for this depth.

### 2.3.3 Dissolved Oxygen

A summary of DO results recorded in mg $L^{-1}$ is tabulated in Table 2.3. Concentrations of DO ranged from 9.0mg $L^{-1}$ at five of the eight stations to 10.7mg $L^{-1}$ at Station ENV36. Profiles revealed that maximum DO concentrations were typically recorded within the top 5m to 10m of the water column, corresponding with the fresher inputs recorded in the salinity profiles. The decrease of DO throughout the water column may be attributed to bacterial degradation of organic matter sinking from the sea-surface, the respiration of planktonic organisms within the upper water column, nitrification, chemical oxidation and the increasing distance from the sea surface-atmosphere interface. A previous study found DO concentrations in the North Sea to vary between 6mg $L^{-1}$ and 10mg $L^{-1}$ (Mahaffey *et al.*, 2020), which is broadly consistent with the current survey.

DO readings in excess of 100% air saturation are possible due to the production of pure oxygen by photosynthetically-active organisms and due to the non-ideal equilibrium of DO between the water and the air above (YSI, 2019). This was the case for surface waters at all offshore stations.

Table 2.3 Summary of Dissolved Oxygen (mg $L^{-1}$)

| Station[1] | Range of Dissolved Oxygen (mg $L^{-1}$) | | | Dissolved Oxygen (mg $L^{-1}$) at Specific Depth | | |
|---|---|---|---|---|---|---|
| | Min | Max | Surface | 25m | 50m | Max Depth |
| ENV53 | 9.4 | 9.6 | 9.6 | NA | NA | 9.5 |
| ENV17 | 9.0 | 10.4 | 10.3 | 9.4 | 9.1 | 9.1 |
| ENV26 | 9.0 | 10.2 | 10.2 | 9.5 | 9.1 | 9.0 |
| ENV04 | 9.1 | 10.6 | 10.6 | 9.6 | 9.2 | 9.1 |
| ENV13 | 9.0 | 10.4 | 10.3 | 9.5 | 9.1 | 9.0 |
| ENV29 | 9.2 | 10.4 | 10.4 | 9.6 | 9.3 | 9.2 |
| ENV31 | 9.0 | 10.2 | 10.2 | 9.5 | 9.2 | 9.1 |
| ENV36 | 9.0 | 10.7 | 10.7 | 9.5 | 9.3 | 9.0 |

1 Stations are listed in order of distance from shore, from closest to furthest.
NA indicates the CTD maximum depth at this station was shallower than the specific depth; therefore, no value was recorded for this depth.

### 2.3.4 Turbidity

A summary of turbidity values in FTU is tabulated in Table 2.4. Turbidity profiles indicated that overall, the turbidity of the water was relatively consistent throughout the water column. A slight increase in turbidity, together with data spikes, were observed in the deepest 5m to 10m at most stations. The spikes are consistent with the sensor becoming momentarily obscured by suspended particles, debris or fauna in the water column, For example, the nearshore Station ENV53 generally exhibited more turbidity than the offshore stations, which may be attributed to the spring plankton bloom observed in the seabed imagery at this station, see (Gardline, 2023b).

Table 2.4 Summary of Turbidity (FTU) from CTD Upcast Profiles

| Station[1] | Range of Turbidity (FTU) | | | Turbidity (FTU) at Specific Depth | | |
|---|---|---|---|---|---|---|
| | Min | Max | Surface | 25m | 50m | Max Depth |
| ENV53 | 1.8 | 6.7 | 2.1 | NA | NA | 2.7 |
| ENV17 | 1.3 | 4.1 | 1.6 | 1.5 | 1.8 | 2.0 |
| ENV26 | 1.4 | 2.8 | 1.5 | 1.5 | 1.6 | 2.2 |
| ENV04 | 1.3 | 3.3 | 1.5 | 1.5 | 1.8 | 2.4 |
| ENV13 | 1.4 | 4.3 | 1.5 | 1.6 | 2.2 | 2.2 |
| ENV29 | 1.4 | 2.7 | 1.5 | 1.5 | 1.5 | 2.1 |
| ENV31 | 1.4 | 3.4 | 1.6 | 1.6 | 1.8 | 2.4 |
| ENV36 | 1.2 | 2.7 | 1.7 | 1.4 | 1.3 | 2.5 |

1 Stations are listed in order of distance from shore, from closest to furthest.
NA indicates the CTD maximum depth at this station was shallower than the specific depth; therefore, no value was recorded for this depth.

### 2.3.5 pH

A summary of pH values recorded during the water profiles is presented in Table 2.5. Values for pH remained relatively consistent throughout the water column and survey area, with slight increases in pH associated with the thermoclines where present. Air-sea interaction with carbon dioxide ensures seawater is generally within a pH range of 7.5 to 8.5.

Table 2.5 Summary of pH from CTD Upcast Profiles

| Station[1] | Range of pH | | | pH at Specific Depth | | |
|---|---|---|---|---|---|---|
| | Min | Max | Surface | 25m | 50m | Max Depth |
| ENV53 | 8.0 | 8.0 | 8.0 | NA | NA | 8.0 |
| ENV17 | 7.9 | 8.0 | 8.0 | 7.9 | 7.9 | 7.9 |
| ENV26 | 7.9 | 8.0 | 8.0 | 8.0 | 7.9 | 7.9 |
| ENV04 | 7.9 | 8.1 | 8.1 | 8.0 | 7.9 | 7.9 |
| ENV13 | 7.9 | 8.1 | 8.0 | 8.0 | 7.9 | 7.9 |
| ENV29 | 7.9 | 8.1 | 8.1 | 8.0 | 7.9 | 7.9 |
| ENV31 | 7.9 | 8.1 | 8.1 | 8.0 | 7.9 | 7.9 |
| ENV36 | 7.9 | 8.1 | 8.1 | 8.0 | 7.9 | 7.9 |

1 Stations are listed in order of distance from shore, from closest to furthest.
NA indicates the CTD maximum depth at this station was shallower than the specific depth; therefore, no value was recorded for this depth.

## 2.4 Sediment Sampling Summary

Seabed sampling was conducted at 40 stations along the ECR, of these a full suite of samples was collected from 38 stations. All 40 stations were sampled using a 0.1m$^2$ mini-Hamon grab (for PSA and macrofauna samples), while a 0.1m$^2$ Day grab (for eDNA and chemistry samples) was used at a subset of 9 stations. Environmental deck and positioning logs are presented in Appendix B with example images presented in Appendix C.

Overall, 88 single grab samples were retained from 128 attempts. Of these retained samples 93% were taken within 20m of their target location and a further 5% were between 10m and 20m of their target location. At Station ENV20, one grab sample was retained 53m from target after several failed sampling attempts associated with coarse sediments. Additionally, this station did not recover a full suite of samples and no samples were retained at Station ENV32 due to the coarse nature of the sediments present. On average, retained samples were acquired 5.1m (±8.1SD) from their target location. The 40 unsuccessful sampling attempts occurred across 17 stations, generally due to stones in the grab jaws (52%) or low sample volume (45%) with one instance of potential contamination of a chemistry sample (3%).

Seabed sampling supported the initial interpretation of the seabed imagery findings, confirming that the seabed comprised primarily sand with varying amounts of gravel, shell fragments and fine sediment. Visible fauna observed within the retrieved grab was limited and included:

- Annelida (Polychaeta)
- Arthropoda (Crustacea, Paguroidea)
- Echinodermata (*Asterias rubens*, Echinoidea, Ophiuroidea, Spatangoidea)
- Mollusca (Bivalvia, Scaphopoda).

## 2.5 Sediment Characteristics

### 2.5.1 Particle Size Analysis

The results of the PSA for the 38 sampled stations along the ECR, determined using wet and dry sieving, are presented in Table 2.6 and Figure 2.3. Full results, including histograms illustrating the particle size distribution at each of the sampled stations, are presented in Appendix G.

Across the ECR, mean particle size varied from 41µm at Station ENV27 to 1813µm at Station ENV11. The five sampled stations closest to the shore in water depths of less than 35m (ENV07, ENV53, ENV57, ENV58 and ENV59) were dominated by sand (>95%) and were described as moderate to moderately well sorted based on Folk and Ward (1957) statistics. These stations recorded negligible (<5%) fines (<63µm; silt and clay) and gravel (>2mm) content.

By contrast, the 24 stations sampled in water depths greater than 70m (ENV02 to ENV06, ENV08 to ENV10, ENV12, ENV17, ENV19, ENV23 to ENV31, ENV33 to ENV36) recorded poorly to very poorly sorted sediment classified as muddy sand under modified Folk (1954). These stations were dominated by fine sand to very fine sand, with fines content ranging from 11% at Station ENV08 to 45% at Station ENV27 and gravel content (<1%).

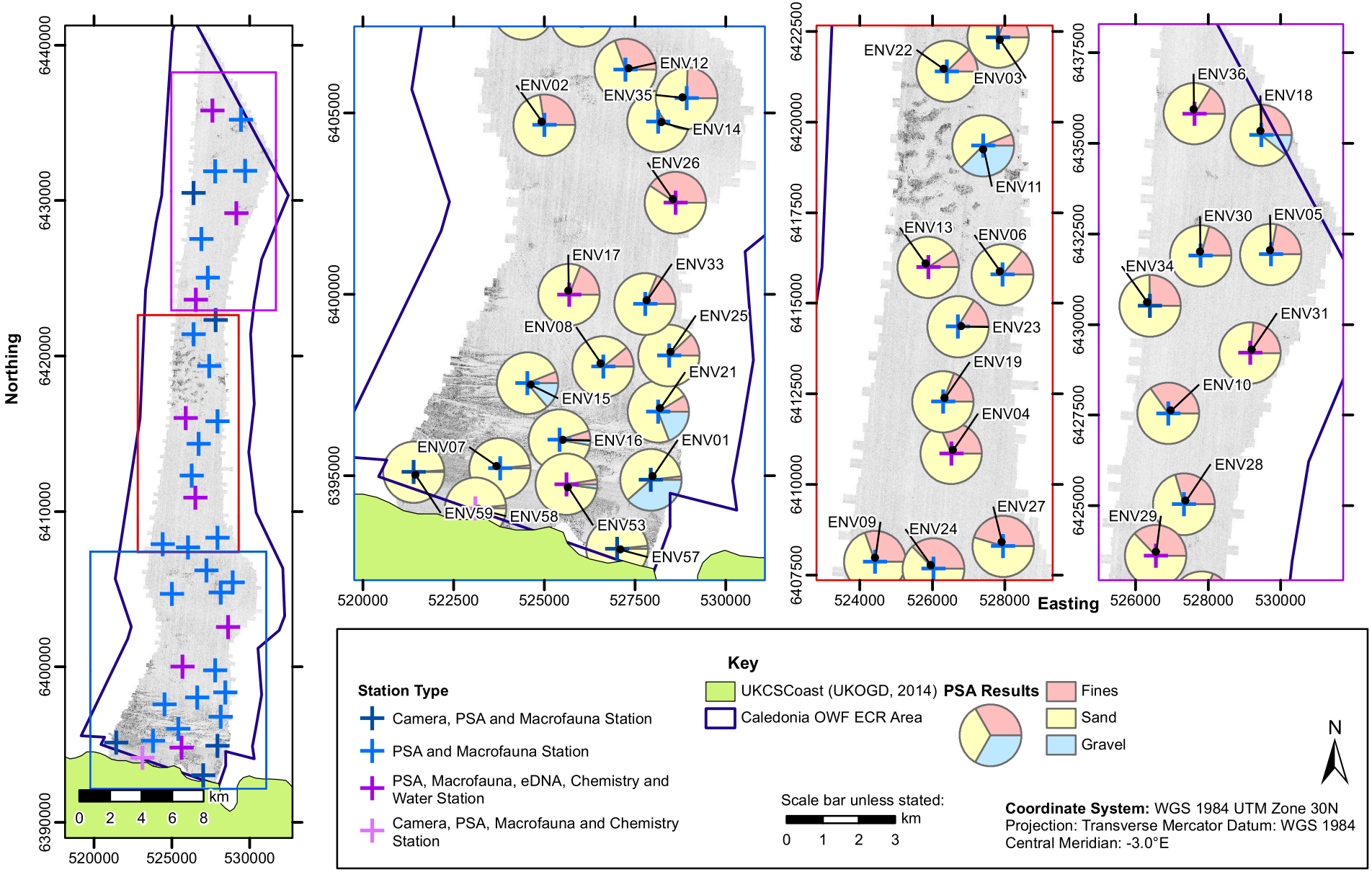
The nine remaining stations (ENV01, ENV11, ENV13 to ENV16, ENV18, ENV21 and ENV22) were located in or near areas of higher or mottled SSS reflectivity and recorded variable gravel content ranging from <1% at Station ENV13 to 39% at Station ENV01. Fines content was also variable across these stations, ranging from 1.8% at Station ENV01 to 25% at Station ENV18. Overall, there was a clear trend associated with water depth, with the strongest correlation being between fines and water depth (Spearman's r=1.00, p<0.01, Appendix H).

Table 2.6 Sediment Characteristics

| Station | | Mean Diameter (µm) | Mean Diameter (phi) | Fines % | Sand % | Gravel % | Wentworth Classification of Median Grain Size | Sorting[1] | Modified Folk Classification | Total Organic Carbon % |
|---|---|---|---|---|---|---|---|---|---|---|
| ENV01 | | 1591 | -0.7 | 1.8 | 59.6 | 38.6 | Very coarse sand | Very poor | Sandy gravel | NA |
| ENV02 | | 90 | 3.5 | 27.3 | 72.6 | <0.1 | Very fine sand | Very poor | Muddy sand | NA |
| ENV03 | | 115 | 3.1 | 19.1 | 80.9 | 0.0 | Very fine sand | Poor | Muddy sand | NA |
| ENV04 | | 61 | 4.0 | 31.3 | 68.7 | 0.0 | Coarse silt | Poor | Muddy sand | 0.37 |
| ENV05 | | 83 | 3.6 | 22.1 | 77.9 | <0.1 | Very fine sand | Poor | Muddy sand | NA |
| ENV06 | | 141 | 2.8 | 14.1 | 85.9 | <0.1 | Fine sand | Poor | Muddy sand | NA |
| ENV07 | | 520 | 0.9 | 1.7 | 97.4 | 0.8 | Coarse sand | Moderate | Sand | NA |
| ENV08 | | 167 | 2.6 | 11.1 | 88.9 | <0.1 | Fine sand | Poor | Muddy sand | NA |
| ENV09 | | 79 | 3.7 | 30.5 | 69.5 | 0.0 | Very fine sand | Very poor | Muddy sand | NA |
| ENV10 | | 51 | 4.3 | 34.9 | 65.1 | 0.0 | Coarse silt | Poor | Muddy sand | NA |
| ENV11 | | 1813 | -0.9 | 6.2 | 56.2 | 37.5 | Very coarse sand | Very poor | Sandy gravel | NA |
| ENV12 | | 69 | 3.9 | 30.6 | 69.4 | 0.0 | Very fine sand | Very poor | Muddy sand | NA |
| ENV13 | | 220 | 2.2 | 9.5 | 90.3 | 0.2 | Fine sand | Poor | Sand | 0.19 |
| ENV14 | | 215 | 2.2 | 16.0 | 81.4 | 2.6 | Fine sand | Poor | Slightly gravelly muddy sand | NA |
| ENV15 | | 490 | 1.0 | 6.1 | 79.8 | 14.1 | Medium sand | Poor | Gravelly sand | NA |
| ENV16 | | 363 | 1.5 | 4.9 | 92.4 | 2.7 | Medium sand | Poor | Slightly gravelly sand | NA |
| ENV17 | | 130 | 2.9 | 18.9 | 80.8 | 0.3 | Fine sand | Poor | Muddy sand | 0.30 |
| ENV18 | | 166 | 2.6 | 24.6 | 64.7 | 10.7 | Fine sand | Very poor | Gravelly muddy sand | NA |
| ENV19 | | 118 | 3.1 | 19.1 | 80.6 | 0.3 | Very fine sand | Poor | Muddy sand | NA |
| ENV21 | | 497 | 1.0 | 8.7 | 72.1 | 19.1 | Medium sand | Very poor | Gravelly muddy sand | NA |
| ENV22 | | 252 | 2.0 | 12.3 | 87.2 | 0.5 | Medium sand | Poor | Muddy sand | NA |
| ENV23 | | 152 | 2.7 | 16.2 | 83.8 | 0.0 | Fine sand | Poor | Muddy sand | NA |
| ENV24 | | 53 | 4.2 | 37.1 | 62.9 | 0.0 | Coarse silt | Very poor | Muddy sand | NA |
| ENV25 | | 143 | 2.8 | 12.2 | 87.8 | <0.1 | Fine sand | Poor | Muddy sand | NA |
| ENV26 | | 47 | 4.4 | 40.7 | 59.3 | 0.0 | Coarse silt | Very poor | Muddy sand | 0.77 |
| ENV27 | | 41 | 4.6 | 45.2 | 54.8 | 0.0 | Coarse silt | Very poor | Muddy sand | NA |
| ENV28 | | 66 | 3.9 | 29.7 | 70.3 | 0.0 | Very fine sand | Poor | Muddy sand | NA |
| ENV29 | | 48 | 4.4 | 37.2 | 62.8 | 0.0 | Coarse silt | Poor | Muddy sand | 0.61 |
| ENV30 | | 91 | 3.5 | 20.4 | 79.6 | <0.1 | Very fine sand | Poor | Muddy sand | NA |
| ENV31 | | 99 | 3.3 | 23.2 | 76.8 | 0.0 | Very fine sand | Poor | Muddy sand | 0.35 |
| ENV33 | | 111 | 3.2 | 18.7 | 81.3 | 0.0 | Very fine sand | Poor | Muddy sand | NA |
| ENV34 | | 73 | 3.8 | 25.3 | 74.6 | 0.1 | Very fine sand | Poor | Muddy sand | NA |
| ENV35 | | 102 | 3.3 | 24.4 | 75.6 | <0.1 | Very fine sand | Very poor | Muddy sand | NA |
| ENV36 | | 107 | 3.2 | 16.0 | 84.0 | <0.1 | Very fine sand | Poor | Muddy sand | 0.62 |
| ENV53 | | 270 | 1.9 | 2.5 | 95.1 | 2.4 | Medium sand | Moderately well | Slightly gravelly sand | 0.17 |
| ENV57 | | 194 | 2.4 | 1.7 | 98.3 | <0.1 | Fine sand | Moderately well | Sand | NA |
| ENV58_A | | 228 | 2.1 | 1.7 | 98.0 | 0.3 | Fine sand | Moderately well | Sand | 0.16 |
| ENV59 | | 350 | 1.5 | 1.1 | 98.8 | 0.1 | Medium sand | Moderately well | Sand | NA |
| This Study | Minimum | 41 | -0.9 | 1.1 | 54.8 | 0.0 | Coarse silt to very coarse sand | Very poor to moderately well | Muddy sand to sandy gravel | 0.16 |
| | Maximum | 1813 | 4.6 | 45.2 | 98.8 | 38.6 | | | | 0.77 |
| | Mean | 248 | 2.8 | 18.5 | 78.0 | 3.4 | | | | 0.40 |
| | ±SD | 371 | 1.3 | 12.2 | 12.3 | 9.2 | | | | 0.43 |

Sediments were not treated to remove carbonates prior to particle size analyses.
NA Not analysed
1 Sorting according to Folk and Ward (1957).

Figure 2.3 Sampled Proportion of Fines, Sand and Gravel Across the ECR



### 2.5.2 Organic Carbon

The results of the TOC analysis, conducted at nine of the ECR stations are presented in Table 2.6. TOC is measured as a percentage of the total weight and represents the carbon constitute of the organic matter. Organic matter in marine sediment is primarily comprised of detrital matter and naphthenic material (carboxylic acids) and humic substances with a small proportion of biological biomass. Where samples were collected, values of TOC ranged from 0.16% at Station ENV58 to 0.77% at Station ENV26. The survey mean TOC value was 0.39% (±0.22SD) and there was a positive correlation with depth (Spearman's $p<0.05$, Appendix H).

In general, for continental shelf sediments there is a close relationship between organic carbon content and the surface area of the mineral matrix (Mayer, 1994). Increased TOC is expected with fine sediment, as it adsorbs to the increased surface area provided by the fine grain particles. As such, TOC values were expected considering the general predominant sand component and percentage fines of the sediment. This was supported by Spearman's rank results, with TOC being significantly positively correlated with percentage fines ($r=0.83$, $p<0.01$) along the ECR (Spearman's Rank, Appendix H).

## 2.6 Hydrocarbon Concentrations

### 2.6.1 Total Hydrocarbons and Alkanes

Concentrations of THC were analysed by GC-FID and, to meet MMO (2022) guidelines, by ultra-violet fluorescence (UVF) spectroscopy. Detailed information on analytical methods is presented in Appendix D.6.
A summary of the results of the hydrocarbon analyses are presented in Table 2.7.

THC analysed by GC-FID (comprising n-alkanes, pristane, phytane, unresolved complex mixture (UCM) and PAHs) ranged from 2.8µg $g^{-1}$ at the shallowest Station ENV58 to 18.7µg $g^{-1}$ at the deepest Station ENV26 with a mean of 10.7µg $g^{-1}$ (±4.6SD). Spearman's rank calculations (Appendix H) showed that concentrations of THC by GC-FID were positively correlated with fines ($r=0.78$, $p<0.05$) and TOC ($r=0.80$, $p<0.05$). Concentrations of THC by UVF were consistently lower than THC measured by GC-FID; with only Stations ENV17, ENV26 and ENV29 recording concentrations above the limit of detection (LOD; 4.1µg $g^{-1}$, 4.2µg $g^{-1}$ and 4.7µg $g^{-1}$, respectively).

It has been previously shown that benthic macrofauna suffer adverse effects when THC is in excess of 50µg $g^{-1}$ (Kjeilen-Eilertsen *et al.*, 2004; UKOOA, 2002; 2005) and as such, this value represents the threshold above which hydrocarbons are expected to have a 'significant environmental impact. Kingston (1992) also previously reported that benthic macrofauna suffer adverse effects, namely reduced diversity, when THC is more than 50µg $g^{-1}$ to 60µg $g^{-1}$ and that specific sensitive species may be impacted at levels greater than 10µg $g^{-1}$. Concentrations of THC by GC-FID at six of the nine stations (ENV04, ENV17, ENV26, ENV29 ENV36 and EnV53) were above the 10µg $g^{-1}$ threshold and as such were expected to have a potential negative impact on specific benthic macrofauna. However, concentrations of THC by UVF were below the threshold of 10µg $g^{-1}$. Mair *et al*. (1987) observed a notable increase in the dominance of opportunistic species at THC levels more than 291.4µg $g^{-1}$, a threshold which none of the stations in the current survey exceeded.

Although THC concentrations give an indication of the total oil in the sediment at each station, it does not give an indication of the source. Analysis of GC chromatograms (Appendix I) may provide further understanding of the distribution of hydrocarbons by giving an indication of the origin of hydrocarbons in marine sediments and the extent to which they are weathered. Peaks in the gas chromatograms correspond to individual n-alkanes and other compounds, with carbon numbers increasing with eluting time. The area beneath the trace constitutes a complex mixture (see Appendix E.2 for further information) of hydrocarbons that could not be resolved by GC-FID. This UCM includes cycloalkane compounds, which remain after substantial weathering and biodegradation of petrogenic inputs to the sediment (McDougall, 2000).

The chromatograms generally presented a pattern of low level, HMW resolved alkanes and UCM ranging from approximately $nC_{21}$ to $nC_{36}$ with a peak between $nC_{28}$ and $nC_{36}$. Such distributions are considered typical of background levels of hydrocarbon inputs in areas such as the North Sea with historical oil and gas explorations which include a relatively low level UCM distributed between $nC_{20}$ and $nC_{33}$. Hydrocarbons in the molecular weight range $nC_{24}$ to $nC_{36}$ commonly originate from terrestrial plant sources (Harborne, 1999) or may represent the residue of highly weathered and biodegraded petrogenic material including natural seeps, shipping discharge and oil and gas exploration and extraction (Bouloubassi *et al.*, 2001; McDougall, 2000). The chromatograms generally display larger resolved peaks over the HMW n-alkanes, with a predominance of heavier weight n-alkanes and compounds with odd carbon numbers over those with an even carbon number. This profile is characteristic of background concentrations of n-alkanes in North Sea sediments and it is indicative of sedimentary biogenic hydrocarbons from a terrestrial plant source (Harborne, 1999; Tran *et al.*, 1995; Wang & Fingas, 2005). The relative size of the UCM feature on the traces largely reflected the concentrations of THC, other than at the two stations nearest the shore (ENV53 and ENV58), which presented notably lower level HMW n-alkanes and UCM compared with stations with similar THC concentrations further offshore (*e.g.* ENV13 and ENV31). The UCM accounted for 62% to 94% of THC along the ECR, indicating that generally hydrocarbons were weathered with some fresher inputs.

Further insight into the origin of hydrocarbons in marine sediments can be gained by measuring concentrations of individual alkanes (Table 2.7). Concentrations of n-alkanes from $nC_{10}$ to $nC_{37}$, pristane and phytane are summarised in Table 2.7. Individual n-alkane concentrations are presented in Table 2.8, whilst their distributions at each station are summarised as bar charts in Appendix I. Total n-alkane concentrations varied between 0.018µg $g^{-1}$ at Station ENV53 and 0.478µg $g^{-1}$ at Station ENV26 with a mean concentration of 0.232µg $g^{-1}$ (±0.164SD).

The ratio of odd to even numbered n-alkanes within the HMW range ($nC_{26}$ to $nC_{30}$), commonly referred to as the carbon preference index (CPI), can provide further insight into the origin of alkanes in marine sediment. Marine sediments containing a high level of biogenically derived (odd carbon number) n-alkanes are known to have CPI ≥2.0, with values ≥4.0 suggesting a virtual absence of petrogenic hydrocarbons (McDougall, 2000). CPI values close to 0 indicate a predominance of petrogenic hydrocarbons. Where calculated, CPI values ranged from 3.0 at Station ENV29 to 4.9 at Station ENV13 suggesting a mixture of petrogenic and biogenic inputs; with biogenic aliphatic hydrocarbons such as higher terrestrial plant waxes being more dominant. At Stations ENV13 and ENV36 the CPI was >4.0 suggesting a virtual absence of petrogenic hydrocarbons.

The ratio of the isoprenoids pristane and phytane can be used to derive similar information to the CPI where a high Pr:Ph ratio is indicative of biogenic hydrocarbons most commonly originating from the decomposition of the phytol side-chain of chlorophyll (Muniz *et al.*, 2004). The isoprenoid pristane is primarily biogenic in origin (Muniz *et al.*, 2004; Bouloubassi *et al.*, 2001) while phytane is rarely produced biogenically but is a common component of crude oil (Steinhauer & Boehm, 1992). Concentrations of pristane ranged from 0.001µg $g^{-1}$ at two stations nearest the shore (ENV53 and ENV58) to 0.022µg $g^{-1}$ at the deepest station (ENV26). Phytane was only recorded above LOD at Stations ENV26, ENV29, ENV31 and ENV36 with concentrations of ranging between 0.002µg $g^{-1}$ and 0.004µg $g^{-1}$, therefore the Pr:Ph ratio was only quantifiable at these stations. The predominance of biogenic pristane over phytane across all stations suggests that primarily biogenic aliphatic hydrocarbons contributed to the THC concentrations, though a degree of petrogenic input was evident by the presence of phytane at four stations.

Overall, although there was a general trend for concentrations of THC, n-alkanes and pristane to be higher in areas of deeper water and finer sediments, this correlation was not evident for UCM concentrations, indicating that other factors such as terrestrial run-off, underlying geology and proximity to existing infrastructure could also be having an influence on the hydrocarbon concentrations across this relatively complex survey area.

## Table 2.7 Summary of Sediment Hydrocarbon Analyses

| Station | UVF | GC-FID | | | | | | | | | GC-MS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | n-alkanes | | | | Isoprenoids | | | | |
| | THC | THC | UCM | nC10-20 | nC21-37 | nC10-37 | CPI[1] | Pristane (Pr) | Phytane (Ph) | Pr/Ph Ratio | NPD[2] | Total PAH |
| ENV04 | <1 | 11.3 | 8.1 | 0.035 | 0.283 | 0.318 | 3.4 | 0.011 | <0.001 | NC | 0.016 | 0.069 |
| ENV13 | <1 | 6.0 | 3.7 | 0.012 | 0.069 | 0.081 | 4.9 | 0.003 | <0.001 | NC | 0.002 | 0.009 |
| ENV17 | 4.1 | 12.9 | 8.2 | 0.033 | 0.331 | 0.364 | 3.7 | 0.010 | <0.001 | NC | 0.014 | 0.061 |
| ENV26 | 4.2 | 18.7 | 13.1 | 0.057 | 0.421 | 0.478 | 3.2 | 0.022 | 0.004 | 5.5 | 0.030 | 0.146 |
| ENV29 | 4.7 | 14.0 | 9.5 | 0.047 | 0.314 | 0.361 | 3.0 | 0.012 | 0.003 | 4.4 | 0.023 | 0.108 |
| ENV31 | <1 | 9.2 | 6.4 | 0.027 | 0.175 | 0.202 | 3.6 | 0.007 | 0.002 | 4.0 | 0.011 | 0.059 |
| ENV36 | <1 | 11.4 | 7.4 | 0.040 | 0.211 | 0.251 | 4.2 | 0.010 | 0.002 | 5.7 | 0.014 | 0.062 |
| ENV53 | <1 | 10.1 | 9.5 | 0.003 | 0.016 | 0.018 | NC | 0.001 | <0.001 | NC | NC | NC |
| ENV58 | <1 | 2.8 | 1.8 | 0.006 | 0.014 | 0.020 | NC | 0.001 | <0.001 | NC | NC | NC |
| Minimum | NQ | 2.8 | 1.8 | 0.003 | 0.014 | 0.018 | NQ | 0.001 | NQ | NQ | NC | NC |
| Maximum | 4.7 | 18.7 | 13.1 | 0.057 | 0.421 | 0.478 | 4.9 | 0.022 | 0.004 | 5.7 | 0.030 | 0.146 |
| Mean | NC | 10.7 | 7.5 | 0.029 | 0.204 | 0.232 | NC | 0.009 | NC | NC | NC | NC |
| ±SD | NC | 4.6 | 3.3 | 0.019 | 0.147 | 0.164 | NC | 0.006 | NC | NC | NC | NC |

Unless indicated, concentrations expressed as µg $g^{-1}$ dry sediment

1 Calculated using $2(nC_{27} + nC_{29})/nC_{26} + 2(nC_{28}) + nC_{30}$ (Farrington & Tripp, 1977).

2 Naphthalenes, phenanthrenes and dibenzothiophenes (total).

NQ Not quantified due to concentrations below LOD.

NC Not calculated due to concentrations below LOD.

Table 2.8 n-Alkane Concentrations

| Station | ENV04 | ENV13 | ENV17 | ENV26 | ENV29 | ENV31 | ENV36 | ENV53 | ENV58 |
|---|---|---|---|---|---|---|---|---|---|
| **$nC_{10}$** | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| **$nC_{11}$** | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| **$nC_{12}$** | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| **$nC_{13}$** | 4 | <1 | 2 | 3 | 3 | 1 | 2 | <1 | <1 |
| **$nC_{14}$** | 2 | 2 | 2 | 4 | 4 | 2 | 3 | <1 | <1 |
| **$nC_{15}$** | 6 | 2 | 5 | 9 | 8 | 4 | 6 | <1 | <1 |
| **$nC_{16}$** | 3 | 2 | 4 | 8 | 6 | 4 | 5 | <1 | <1 |
| **$nC_{17}$** | 9 | 3 | 9 | 16 | 12 | 6 | 11 | 2 | 4 |
| **$nC_{18}$** | 3 | 1 | 5 | 4 | 4 | 3 | 4 | <1 | <1 |
| **$nC_{19}$** | 5 | 2 | 4 | 8 | 7 | 4 | 6 | 1 | 2 |
| **$nC_{20}$** | 3 | <1 | 2 | 5 | 4 | 2 | 3 | <1 | <1 |
| **$nC_{21}$** | 12 | 4 | 9 | 9 | 9 | 4 | 8 | <1 | 1 |
| **$nC_{22}$** | 4 | 2 | 4 | 9 | 7 | 4 | 4 | <1 | <1 |
| **$nC_{23}$** | 15 | 2 | 20 | 15 | 11 | 6 | 10 | <1 | <1 |
| **$nC_{24}$** | 11 | 5 | 9 | 8 | 10 | 5 | 6 | <1 | <1 |
| **$nC_{25}$** | 18 | 3 | 34 | 37 | 27 | 19 | 22 | 3 | <1 |
| **$nC_{26}$** | 10 | 2 | 7 | 15 | 13 | 5 | 7 | <1 | <1 |
| **$nC_{27}$** | 23 | 6 | 27 | 44 | 28 | 13 | 18 | 2 | 2 |
| **$nC_{28}$** | 10 | 2 | 11 | 22 | 15 | 6 | 6 | 2 | <1 |
| **$nC_{29}$** | 44 | 13 | 50 | 85 | 54 | 29 | 38 | 1 | 4 |
| **$nC_{30}$** | 11 | 2 | 13 | 22 | 11 | 7 | 7 | 2 | 1 |
| **$nC_{31}$** | 57 | 5 | 77 | 91 | 65 | 36 | 48 | 3 | 3 |
| **$nC_{32}$** | 4 | 10 | 4 | 7 | 4 | 3 | 3 | 1 | 4 |
| **$nC_{33}$** | 31 | 5 | 29 | 12 | 22 | 19 | 18 | 2 | <1 |
| **$nC_{34}$** | 7 | 4 | 11 | 7 | 5 | 5 | 4 | <1 | <1 |
| **$nC_{35}$** | 14 | 3 | 13 | 17 | 14 | 7 | 6 | <1 | <1 |
| **$nC_{36}$** | 6 | 2 | 6 | 11 | 9 | 5 | 3 | <1 | <1 |
| **$nC_{37}$** | 6 | 1 | 9 | 12 | 8 | 3 | 4 | <1 | <1 |
| **Total** | **318** | **81** | **364** | **478** | **361** | **202** | **251** | **18** | **20** |

Concentrations expressed as ng $g^{-1}$ dry weight sediment.

### 2.6.2 Polycyclic Aromatic Hydrocarbons

Total PAH concentrations for the MMO (2022) stipulated compounds ranged from 0.009 µg $g^{-1}$ at Station ENV13 to 0.146 µg $g^{-1}$ at Station ENV26, with the exception of the two nearshore Stations ENV53 and ENV58 where the total PAH concentrations were below the LOD.

Information on the origin of PAHs can be derived from the parent compound molecular weight indices as detailed by Yunker *et. al.* (2002) and are presented in Figure 2.4. The molecular mass indices identified pyrogenic PAHs at all stations. The 276 (indeno[123,cd]pyrene and benzo[ghi]perylene) mass indices identified that stations were from grass, wood and coal combustion.

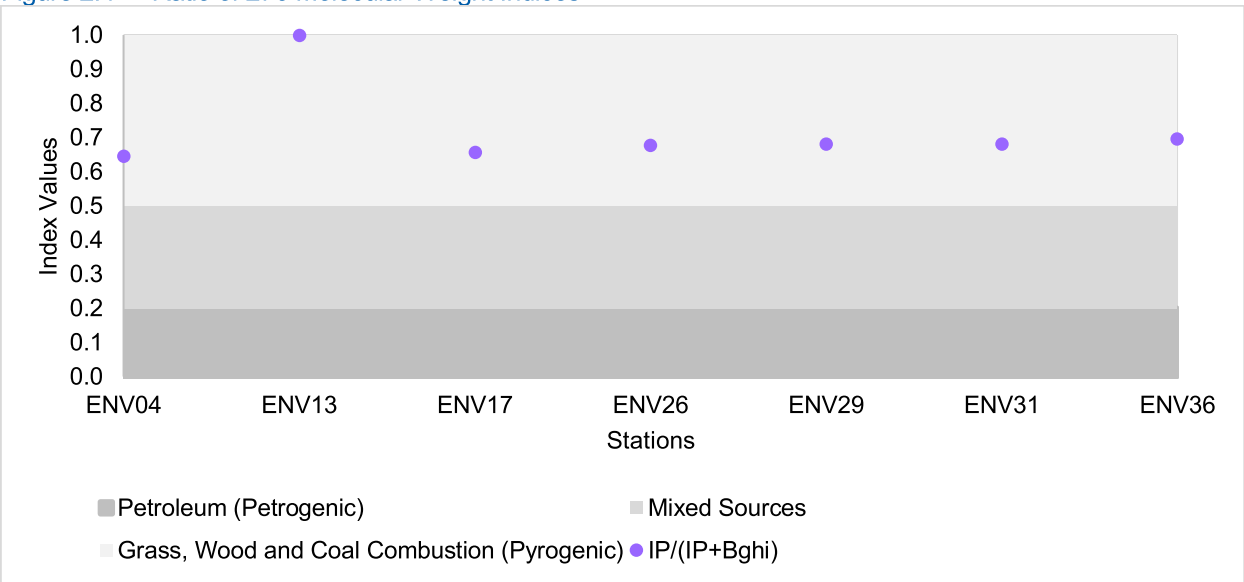
A study of the alkyl homologue distributions can provide further indication of sources of PAHs in sediment. Pyrogenic PAHs are predominantly unalkylated HMW compounds, whereas petrogenic PAHs display a greater degree of alkylation, particularly of the LMW compounds of naphthalene and phenanthrene (Wang & Fingas,

2005). As illustrated in Figure 2.5, where present it is evident that the alkylated homologues are more abundant than their parent compounds which indicates there are petrogenic PAHs present, however in low concentrations.

The best estimates of the potential toxicity of PAHs in marine sediments are the ERL and ERM values (Long *et al.*, 1995), as described in Section 1.3 and Appendix E.2. Total PAH concentrations and those for individual compounds were well below their respective ERL values, indicating that toxic effects to fauna by PAHs are unlikely. The AET (Buchman, 2008) represents the concentration above which adverse biological impacts would be expected on the biological indicator due to the exposure to that contaminant alone. Total and individual PAH concentrations were also well below their respective AETs at all stations, further suggesting that overall adverse biological impacts would be extremely unlikely.

When comparing to OSPAR BC, BAC and EAC (OSPAR, 2005; 2009a) concentrations were first normalised to 2.5% TOC (as presented in Appendix I). After normalisation, several of the measurable concentrations for many of the PAHs were considered above BC concentrations at Stations ENV04, ENV17, ENV26, ENV29 and ENV31; however, none exceeded the EAC threshold. Furthermore, when comparing mean concentrations for the entire survey area no PAH concentrations were above the corresponding BAC threshold, meaning that overall, PAH concentrations could be considered near background.

Figure 2.4 Ratio of 276 Molecular Weight Indices



## Table 2.9 PAH Concentrations

| Station | ENV04 | ENV13 | ENV17 | ENV26 | ENV29 | ENV31 | ENV36 | ENV53 | ENV58 | Long et al. (1995) ERL | Buchman (2008) AET[1] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Acenaphthene | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | 16 | 130[E] |
| Acenaphthylene | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | 44 | 171[E] |
| Anthracene | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | 85.3 | 280[E] |
| Benzo[a]anthracene | 2 | <1 | 2 | 5 | 3 | 2 | 2 | <1 | <1 | 261 | 960[e] |
| Benzo[a]pyrene | 3 | <1 | 3 | 7 | 5 | 3 | 3 | <1 | <1 | 430 | 1100[E] |
| Benzo[b]fluoranthene | 8 | 2 | 6 | 16 | 12 | 7 | 8 | <1 | <1 | NA | 1800 [EJ] |
| Benzo[e]pyrene | 8 | 2 | 6 | 17 | 13 | 7 | 9 | <1 | <1 | NA | NA |
| Benzo[ghi]perylene | 5 | <1 | 4 | 9 | 7 | 4 | 4 | <1 | <1 | NA | NA |
| Benzo[k]fluoranthene | 6 | 2 | 5 | 13 | 9 | 5 | 5 | <1 | <1 | NA | 1800[EJ] |
| C1-naphthalenes | 3 | <1 | 2 | <1 | 3 | 2 | 2 | <1 | <1 | NA | NA |
| C1-phenanthrene | 3 | <1 | 3 | 6 | 5 | 3 | 3 | <1 | <1 | NA | NA |
| C2-naphthalenes | 4 | 2 | 4 | 10 | 6 | 3 | 4 | <1 | <1 | NA | NA |
| C3-naphthalenes | 3 | <1 | 2 | 5 | 4 | 2 | 2 | <1 | <1 | NA | NA |
| Chrysene | 3 | <1 | 3 | 6 | 4 | 3 | 2 | <1 | <1 | 384 | 950[E] |
| Dibenzo[ah]anthracene | <1 | <1 | <1 | 3 | 2 | <1 | <1 | <1 | <1 | 63.4 | 230[OM] |
| Fluoranthene | 4 | <1 | 4 | 9 | 6 | 5 | 3 | <1 | <1 | 600 | 1300[E] |
| Fluorene | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | 19 | 120[E] |
| Indeno[1,2,3-cd]pyrene | 8 | 2 | 7 | 20 | 15 | 8 | 10 | <1 | <1 | 160 | 600[M] |
| Naphthalene | <1 | <1 | <1 | 2 | <1 | <1 | <1 | <1 | <1 | NA | 230[E] |
| Perylene | 3 | <1 | 4 | 7 | 2 | <1 | <1 | <1 | <1 | NA | NA |
| Phenanthrene | 2 | <1 | 2 | 5 | 3 | 2 | 2 | <1 | <1 | NA | 660[E] |
| Pyrene | 3 | <1 | 3 | 7 | 5 | 4 | 3 | <1 | <1 | 665 | 2400[E] |
| **Total** | **69** | **9** | **61** | **146** | **108** | **59** | **62** | **0** | **0** | **4022** | NA |

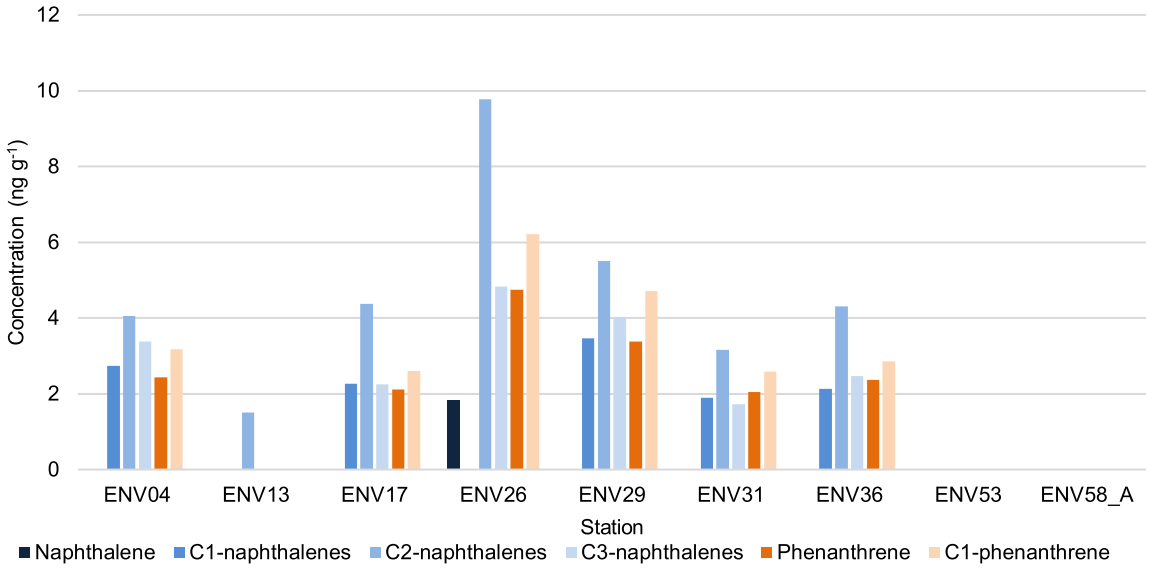
Concentrations expressed as ng $g^{-1}$ dry weight sediment.

Grey text relate to concentrations below LOD.

1 Apparent effect threshold according to Buchman (2008) under the following assessment targets in superscript E = Echinoderm larvae, I = infaunal community impact, M = microtox assay and O = oyster larvae

Results in green are from published background data see Section 1.3.

Figure 2.5 Naphthalene and Phenanthrene Parent Versus Alkylated Homologue PAHs




### 2.6.3 Polychlorinated Biphenyls

Polychlorinated biphenyl concentrations were recorded below LOD at all sampled stations.

### 2.6.4 Polybrominated Diphenyl Ethers

Concentrations of PBDEs, presented in Table 2.8, were below LOD with the exception of PBDE 209 which ranged from below the LOD at Station ENV58 to 1.53ng $g^{-1}$ at Station ENV26. After normalisation to 2.5% TOC (see Appendix J), PBDE 209 at all but Station ENV58 exceeded the OSPAR (2020) BAC. However, concentrations were below the Federal Environment Quality Guidelines (FEQGs; Viñas *et al.*, 2023)). PBDE 209 has a high affinity to bind to sediment, which reduces mobility in the environment.

Table 2.10 Concentrations of PBDEs

| Station | ENV04 | ENV13 | ENV17 | ENV26 | ENV29 | ENV31 | ENV36 | ENV53 | ENV58 | FEQG (Viñas *et al.*, 2023) |
|---|---|---|---|---|---|---|---|---|---|---|
| PBDE 17 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | NA |
| PBDE 28 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 110 |
| PBDE 47 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 97.5 |
| PBDE 66 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 97.5 |
| PBDE 85 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 1 |
| PBDE 99 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 1 |
| PBDE 100 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 1 |
| PBDE 138 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | NA |
| PBDE 153 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 1100 |
| PBDE 154 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 1100 |
| PBDE 183 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | 14000 |
| PBDE 209 | 0.80 | 0.71 | 0.61 | 1.53 | 0.28 | 1.86 | 0.39 | 0.23 | <0.2 | 47.5 |

Concentrations expressed as ng $g^{-1}$ dry weight sediment.
Results in green are from published background data see Section 1.3.

### 2.6.5 Organochloropesticides

Generally, concentrations of OCPs were below the LOD with the exception of dieldrin at Station ENV04 (0.1ng $g^{-1}$). Dieldrin concentration at ENV04 did not exceeded the CAL1 (MMO, 2022) concentration of 0.5ng $g^{-1}$.

## 2.7 Organotins

The organotins dibutyltin and tributyltin were below LOD at all sampled stations.

## 2.8 Metal Concentrations

Following extraction by aqua regia, concentrations of As, Cd, Cr, Cu, Hg, Ni, Pb and Zn were determined by ICP-MS. The results of the metal analyses are presented in Table 2.11.

Of the metals reported, Cr, Cu, Ni, Pb and Zn were positively correlated with depth and finer sediment ($p<0.01$, Appendix H), indicating that fluctuations in metal concentrations were influenced by variations in sediment particle size and the resultant adsorption properties. These five metals also showed positive correlations with TOC and LMW n-alkanes. Concentrations of Cd were below LOD (<0.04µg $g^{-1}$) at Stations ENV13 and ENV53 while Hg concentrations were at or below LOD (<0.01µg $g^{-1}$) at all stations except Station ENV31 where a concentration of 0.01µg $g^{-1}$ was recorded.

Metals data were directly compared to MMO (2022) CALs, Buchman (2008) AETs and Long *et al*. (1995) ERL and ERM (see Section 1.3), none of which were exceeded at any station, indicating that toxicological impacts where unlikely to occur,

Furthermore, concentrations of Cd, Pb and Zn, once normalised to 1% TOC (Appendix K), were below their respective OSPAR (2009c) EACs and can therefore be considered to present no significant risk to the environment.

Table 2.11 Sediment Metal Concentrations

| Station | | As | Cd | Cr | Cu | Hg | Ni | Pb | Zn |
|---|---|---|---|---|---|---|---|---|---|
| ENV04 | | 3.3 | 0.08 | 11.6 | 4.3 | <0.01 | 7.0 | 4.7 | 18.1 |
| ENV13 | | 2.2 | <0.04 | 7.4 | 3.0 | <0.01 | 3.3 | 2.5 | 10.6 |
| ENV17 | | 2.6 | 0.04 | 10.2 | 3.5 | <0.01 | 5.3 | 3.9 | 16.3 |
| ENV26 | | 4.1 | 0.12 | 14.7 | 5.9 | <0.01 | 9.8 | 6.2 | 24.8 |
| ENV29 | | 3.3 | 0.11 | 13.8 | 4.8 | <0.01 | 9.0 | 5.4 | 19.7 |
| ENV31 | | 2.1 | 0.05 | 9.1 | 3.9 | 0.01 | 5.6 | 3.4 | 14.9 |
| ENV36 | | 2.1 | 0.08 | 10.6 | 3.9 | <0.01 | 6.9 | 3.9 | 14.6 |
| ENV53 | | 5.4 | <0.04 | 6.1 | 3.0 | <0.01 | 3.7 | 2.6 | 11.9 |
| ENV58 | | 3.7 | 0.06 | 7.4 | 3.2 | <0.01 | 4.5 | 2.1 | 11.0 |
| This Study | Minimum | 2.1 | NQ | 6.1 | 3.0 | NQ | 3.3 | 2.1 | 10.6 |
| | Maximum | 5.4 | 0.12 | 14.7 | 5.9 | 0.01 | 9.8 | 6.2 | 24.8 |
| | Mean | 3.2 | NC | 10.1 | 3.9 | NC | 6.1 | 3.9 | 15.8 |
| | ±SD | 1.1 | NC | 2.9 | 1.0 | NC | 2.3 | 1.4 | 4.6 |
| CAL 1 (MMO, 2022) | | 20 | 0.4 | 40 | 40 | 0.3 | 20 | 50 | 130 |
| CAL 2 (MMO, 2022) | | 100 | 5.0 | 400 | 400 | 3.0 | 200 | 500 | 800 |
| Long *et al.* (1995) | ERL | 8.2 | 1.2 | 81.0 | 34.0 | 0.15 | 20.9 | 46.7 | 150 |
| | ERM | 70.0 | 9.6 | 370.0 | 270.0 | 0.70 | 51.6 | 218.0 | 410 |
| Buchman (2008) | AET | 35 | 3 | 62 | 390 | 0.41 | 110 | 400 | 410 |

Concentrations expressed as µg $g^{-1}$ dry weight sediment.
Unless specified, concentrations determined following aqua regia sediment extraction.
NQ Not quantified due to values below LOD.
NC Not calculated due to all values below the LOD.
Results in green are from published background data see Section 1.3.

## 2.9 Statistical Analysis of Sediment Physico-chemical Results

### 2.9.1 Multivariate

Multivariate analyses were performed using PRIMER v7 (Plymouth Marine Laboratories) on the nine station physico-chemical data set to ascertain similarities and differences between stations. Prior to undertaking the analysis the following variables were excluded:

- Mean particle diameter (phi) was excluded as mean particle diameter (µm) is more intuitive.
- Sand was excluded as it is closely related with fines.
- HMW n-alkanes ($nC_{21}$-$nC_{37}$) concentration was excluded as it is closely related with total n-alkanes.
- Hg was excluded as concentrations were predominantly below the LOD.

In order for phytane, total PAH, PDBE 209 and Cd to be included, stations recording concentrations below LOD were assigned a concentration just below the LOD to allow appropriate ranking.

Based on the Dixon's test for outliers, log transformation of the sediment characteristics (PSA and TOC) variables was chosen to down-weigh the influence of the relatively high gravel content at Station ENV53. The data set was normalised to make the variables unitless and Euclidean distance resemblance matrix was produced. A CLUSTER analysis was performed to graphically represent the (dis)similarities between the stations, with a SIMPROF routine run in conjunction, to show whether the differences between stations were statistically significant. Stations joined by red lines are statistically indistinguishable from each other, while those joined by black lines are statistically distinct. Only three or more stations can be considered a true cluster due to the permutative nature of SIMPROF. A non-metric multidimensional scaling (nMDS) routine was also run, which creates a two-dimensional plot of the stations from the similarity matrix. The configuration of the stations on the

MDS plot reflects similarity with distances between stations being representative of their Euclidean distance or relative (dis)similarity.

The Euclidean similarity dendrogram for the physico-chemical data set (Figure 2.6a) illustrates variations in the physico-chemical characteristics of the stations sampled along the ECR. The SIMPROF routine identified two clusters and one closely associated pair of stations. The corresponding nMDS (Figure 2.6b) has a stress value of 0.01 indicating it is an almost perfect two-dimensional representation of rank dis(similarities) and overall pattern observed in the physico-chemical data set. The key factors responsible for the multivariate pattern in the physico-chemical data are displayed in Table 2.12, based on a review of the raw data and SIMPER analysis.

The results of a BEST BIOENV routine on the data set indicated that three analytes accounted for approximately 96% of the variation between stations, these were mean grain size and the concentrations of pristane and total PAH, indicating that natural variation is influencing the low-level concentrations of hydrocarbons along the ECR. Further, when looking at these variables in isolation, the BEST result indicated total PAH correlated with 95.5% of the overall pattern. A selection of these variables has been plotted to illustrate the trends in Figure 2.6c.

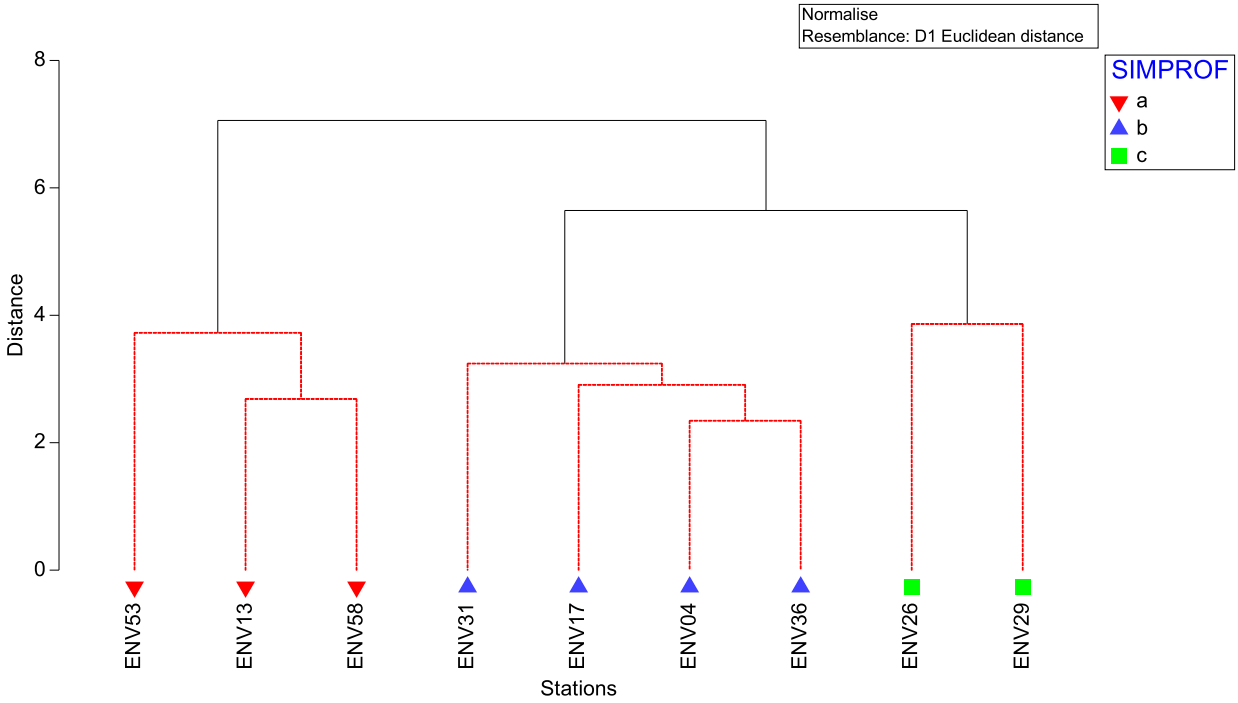
Results of an analysis of similarity (ANOSIM) indicated that the physico-chemical characteristics of stations when grouped by 25m depth zone (Figure 2.6d) were statistically different ($r=0.813$, $p<0.01$).

Table 2.12 Physico-chemical Parameters Influencing SIMPROF Separation in the 9 Station Data Set

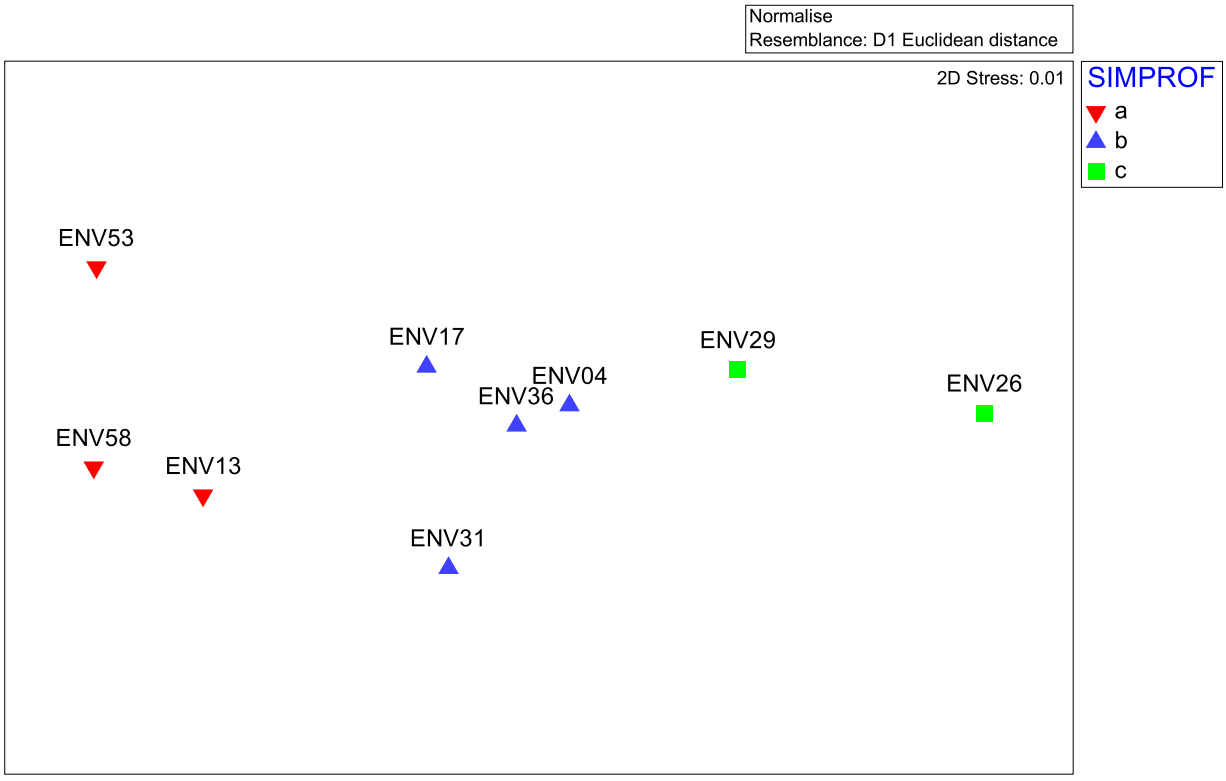
| Stations | SIMPROF | Dissimilarity (Euclidean Distance) | Physico-chemical Parameters Influencing Station Separation | Other factors |
|---|---|---|---|---|
| ENV13, ENV53, ENV58 | SIMPROF *a* vs *b, c* | 7.06 | Coarsest sediments, lowest concentrations of TOC, n-alkanes, pristane, PAH and most metals (Cr, Cu, Ni, Pb and Zn) | Shallowest stations |
| ENV04, ENV17, ENV31, ENV36 | SIMPROF *b* vs c | 5.64 | Coarser sediment and lower concentrations of hydrocarbons and metals than the remaining stations. | |
| ENV26, ENV29 | SIMPROF *c* | NA | NA | Deepest Stations |

## Figure 2.6 Multivariate Analyses of the Nine Station Physico-chemical Data Set

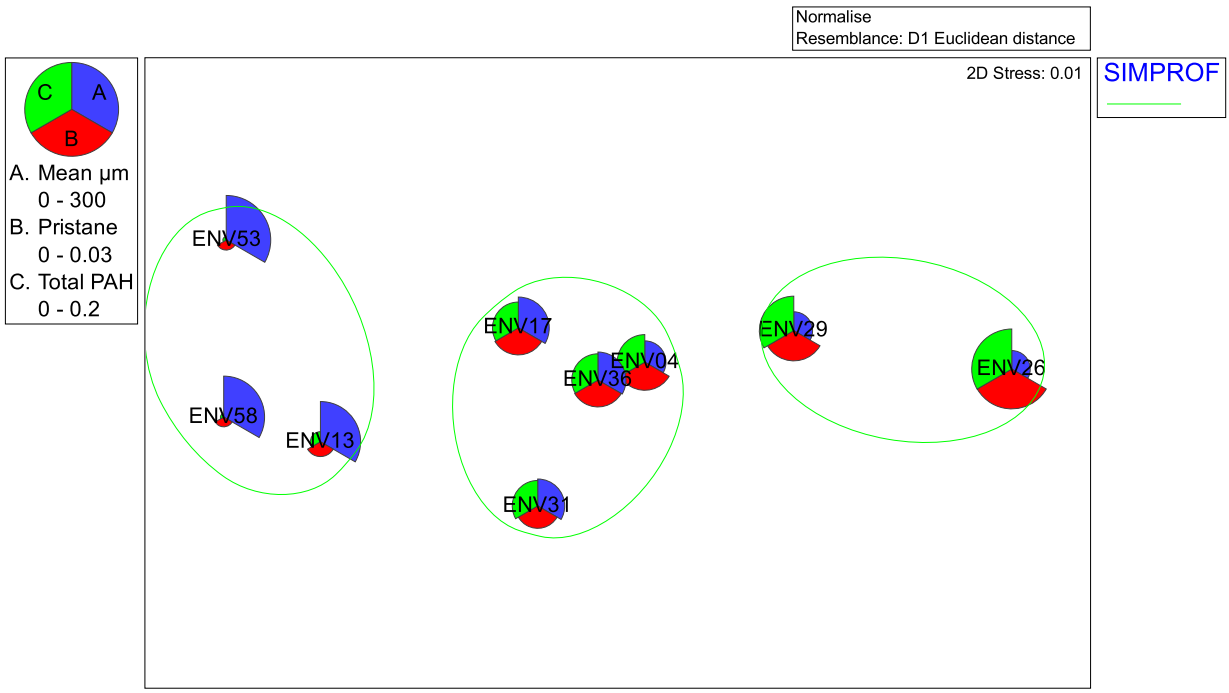
a) Euclidean Distance Dendrogram



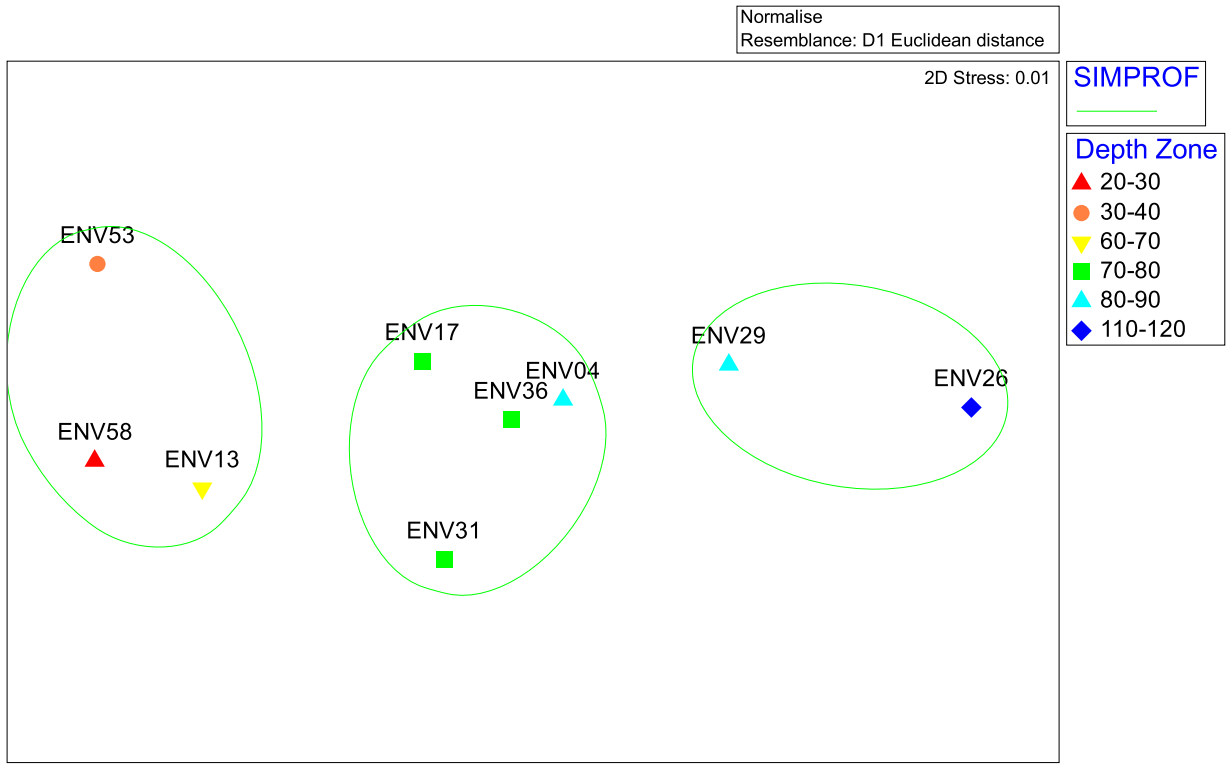

b) MDS Ordination



c) MDS Ordination with Bubbles Representing a Selection of Environmental Variables




d) MDS Ordination with Symbols Indicating 10m Depth Zone



## 2.10 DNA Metabarcoding Results

### 2.10.1 Overview

Two samples for sediment eDNA and four for water eDNA (two near surface and two near seabed) were collected at a subset of eight of the stations where physico-chemical samples were obtained (*i.e.* excluding ENV58) with primary samples sent to the laboratory. The remaining samples were retained as spares. All records are provided in Appendix L. Each row in Appendix L represents one operational taxonomic unit (OTU), shown with the lowest possible taxonomic assignment based on currently available reference data. Each column represents a sample, showing the proportion of sequence reads per detected OTU. Care should be taken interpreting the numbers of reads in terms of relative species abundance or biomass as unavoidable biases introduced during the laboratory process can have a major effect on this relationship, for example, some species amplify more readily than others during processing.

The most conservative approach is to analyse the data in terms of presence-absence. Due to the number of taxa included in the analysis, presence-absence data still has high statistical power for demonstrating change. If abundance data for particular species is important to the project, then incidence across multiple samples can be used as a proxy for abundance (*e.g.* a species detected in every sample replicate is likely to be more abundant than one found only in a small proportion of replicates). Alternatively, this may be a scenario in which conventional methods are the better suited (see Section 0).

### 2.10.2 Summary of Notable Species

The sediment invertebrate eDNA data set detected *A. islandica* at Station ENV29. This species is on the OSPAR (2008) list of threatened and/or declining species and habitats and is listed as a low or limited mobility species PMF in Scottish offshore waters (NatureScot, 2020a).

The water vertebrate eDNA data set detected Norway pout (*Trisopterus esmarkii*) and Atlantic mackerel (*Scomber scombrus*), which are PMFs in Scottish waters (NatureScot, 2020a), and listed on the Scottish Biodiversity List (2020b). Both species are listed as least concern when considering global and European stocks on the IUCN (2023) Red List. Three marine mammals were detected; harbour porpoise (*Phocoena phocoena*), bottlenose dolphin (*Tursiops truncatus*) and Risso's dolphin (*Grampus griseus*), and are listed on the Scottish Biodiversity List (2020b) and are PMFs in Scottish waters (NatureScot, 2020a).

In addition, the rainbow (steelhead) trout (*Oncorhynchus mykiss*) was detected at Station ENV53, located approximately 2.5km from the coast. This species is known to migrate to the sea during its lifecycle. They also thrive in sea lochs where they are a commercially farmed species (Kames, 2023).

The fish eDNA data set recorded Atlantic cod (*Gadus morhua*), herring (*Clupea harengus*) and whiting (*Merlangius merlangus*) which are listed as PMFs in Scottish waters (NatureScot, 2020a), and on the Scottish Biodiversity List (2020b) together with *T. esmarkii* and *S. scombrus* also detected in the vertebrate analysis. *G. morhua* is listed as vulnerable on the IUCN (2023) Red List when considering global stock assessment; however, it is listed as least concern when considering European stocks. Additionally, the brown or sea trout (*Salmo trutta*) was detected at Station ENV53. This species, which is listed on the Scottish Biodiversity List (NatureScot, 2020b), has two possible lifecycle patterns, one of which matures at sea and stays in coastal areas.

### 2.10.3 Summary Statistics for Sediment Metabarcoding

A total of 491 OTUs were detected from sediment samples along the ECR as detailed in Table 2.13. Full read counts of the OTUs detected per station are tabulated in Appendix L. Of the 491 detected bacterial and infaunal OTUs, a greater percentage of infaunal OTUs were identified to species level (42%) compared to the bacterial OTUs (1%) possibly related to the larger pool of reference material for infaunal OTUs, see Table 2.13.

*Bacteria*

The bacterial data set identified 26 taxonomic groups based on class with proportional contributions of these taxonomic groups along the ECR detailed in Table 2.14 and presented for each station in Figure 2.7. The 'Other' category comprised 170 OTUs which could not be identified to class.

The most detected taxonomic group along the ECR (n=170) was the 'Other' which accounted for 38% of OTUs. The second most detected taxonomic group was Gammaproteobacteria (n=95) accounting for 21% of the OTUs. Gammaproteobacteria dominance is likely given it is one of the richest classes within the bacteria phyla (Williams *et al.*, 2010). The relative dominance of 'Other' within the proportional contributions was partly due to the inability to determine these OTUs further than phylum (n=79) or domain (n=91).

Of the 443 bacterial OTUs, a total of 75 (17%) were present in all sediment stations, while 109 (25%) occurred at a single station. The relatively high numbers of widespread OTUs and lone OTUs along the ECR suggested that the community had been subjected to relatively little disturbance.

*Infauna*

A total of 12 taxonomic groups based on class were detected from the sediment infauna data set with the proportional contribution of these taxonomic groups along the ECR detailed in Table 2.15 and presented for each station in Figure 2.8. The 'Other' category comprised one OTU which was only classified to the phylum Platyhelminthes.

Polychaeta (n=20) was the most detected taxonomic group along the ECR and accounted for 42% of the OTUs. The second most detected group was the Arthropoda Copepoda (n=10, 21%). The relative abundance of 'Other' within the proportional contributions was partly due to the inability to determine these OTUs further than phylum (n=1). Five infaunal taxonomic groups (Chromadorea, Eurotatoria, Ophiuroidea, Palaeonemertea and Other) were represented by a single OTU.

Of the 48 infaunal OTUs, a total of 30 (63%) were present at a single station along the ECR. However, unlike the bacterial data set, none was detected at all stations. The absence of a consistent infaunal community as well as a relatively high proportion of lone OTUs suggest the community heterogeneity across the ECR may have been under sampled for the infaunal size class. This may be improved by analysis of the samples from the remaining 32 stations or analysis of second samples acquired at each of the stations, though it is not certain that this would fill all community gaps.

Table 2.13 OTU Sediment Detections per Target and Percentage Successfully Classified

| Target | Number of Stations Analysed | Number of Stations containing OTUs | Number of OTUs | Phylum (%) | Class (%) | Order (%) | Family (%) | Genus (%) | Species (%) |
|---|---|---|---|---|---|---|---|---|---|
| Bacteria (sediment) | 8 | 8 | 443 | 79 | 62 | 38 | 25 | 6 | 1 |
| Infauna (sediment) | 8 | 8 | 48 | 100 | 98 | 77 | 73 | 65 | 42 |

Table 2.14 Contribution of Gross Sediment Bacterial OTU Taxonomic Groups

| Group by Class | Reads | | OTUs | |
|---|---|---|---|---|
| | Number | Proportional Contribution % | Abundance | Proportional Contribution % |
| Acidimicrobiia | 646 | <1 | 3 | <1 |
| Acidobacteria | 12847 | 5 | 20 | 5 |
| Actinomycetia | 6650 | 3 | 18 | 4 |
| Alphaproteobacteria | 6644 | 3 | 36 | 8 |
| Aminicenantia | 620 | <1 | 4 | <1 |
| Anaerolineae | 5888 | 2 | 16 | 4 |
| Bacteroidia | 3655 | 1 | 9 | 2 |
| Betaproteobacteria | 3183 | 1 | 2 | <1 |
| Cyanophyceae | 64 | <1 | 1 | <1 |
| Cytophagia | 2276 | <1 | 8 | 2 |
| Dehalococcoidia | 187 | <1 | 1 | <1 |
| Deltaproteobacteria | 123 | <1 | 2 | <1 |
| Flavobacteria | 2016 | <1 | 8 | 2 |
| Fusobacteria | 129 | <1 | 1 | <1 |
| Gammaproteobacteria | 82244 | 33 | 95 | 21 |
| Ignavibacteria | 412 | <1 | 1 | <1 |
| Kiritimatiellae | 126 | <1 | 3 | <1 |
| Nitrospira | 1309 | <1 | 3 | <1 |
| Phycisphaerae | 59 | <1 | 2 | <1 |
| Planctomycetacia | 6376 | 3 | 30 | 7 |
| Planctomycetia | 62 | <1 | 1 | <1 |
| Sphingobacteria | 143 | <1 | 2 | <1 |
| Spirochaetes(Class) | 35 | <1 | 1 | <1 |
| Thermodesulfovibrionia | 84 | <1 | 1 | <1 |
| Verrucomicrobiae | 659 | <1 | 5 | 1 |
| Other Bacteria | 111703 | 45 | 170 | 38 |
| **Total** | **248140** | **100** | **443** | **100** |

"Other Bacteria" includes the 79 (18%) OTUs that could not be identified beyond Phylum and the 91 (21%) OTUs that could not be identified beyond domain.

Table 2.15 Contribution of Gross Sediment Infaunal OTU Taxonomic Groups

| Group by Class | Reads | | OTUs | |
|---|---|---|---|---|
| | Number | Proportional Contribution % | Abundance | Proportional Contribution % |
| Bivalvia | 243 | <1 | 3 | 6 |
| Chromadorea | 66 | <1 | 1 | 2 |
| Copepoda | 2189 | 1 | 10 | 21 |
| Echinoidea | 36734 | 21 | 2 | 4 |
| Eurotatoria | 118 | <1 | 1 | 2 |
| Gastropoda | 1072 | <1 | 3 | 6 |
| Hydrozoa | 4905 | 3 | 3 | 6 |
| Ophiuroidea | 34977 | 20 | 1 | 2 |
| Palaeonemertea | 43 | <1 | 1 | 2 |
| Polychaeta | 91926 | 53 | 20 | 42 |
| Sagittoidea | 478 | <1 | 2 | 4 |
| Other | 38 | <1 | 1 | 2 |
| **Total** | **172789** | **100** | **48** | **100** |

"Other" represents OTUs that could not be identified beyond Phylum.

Figure 2.7 Contributions of Gross Sediment Bacteria OTU Taxonomic Groups by Station

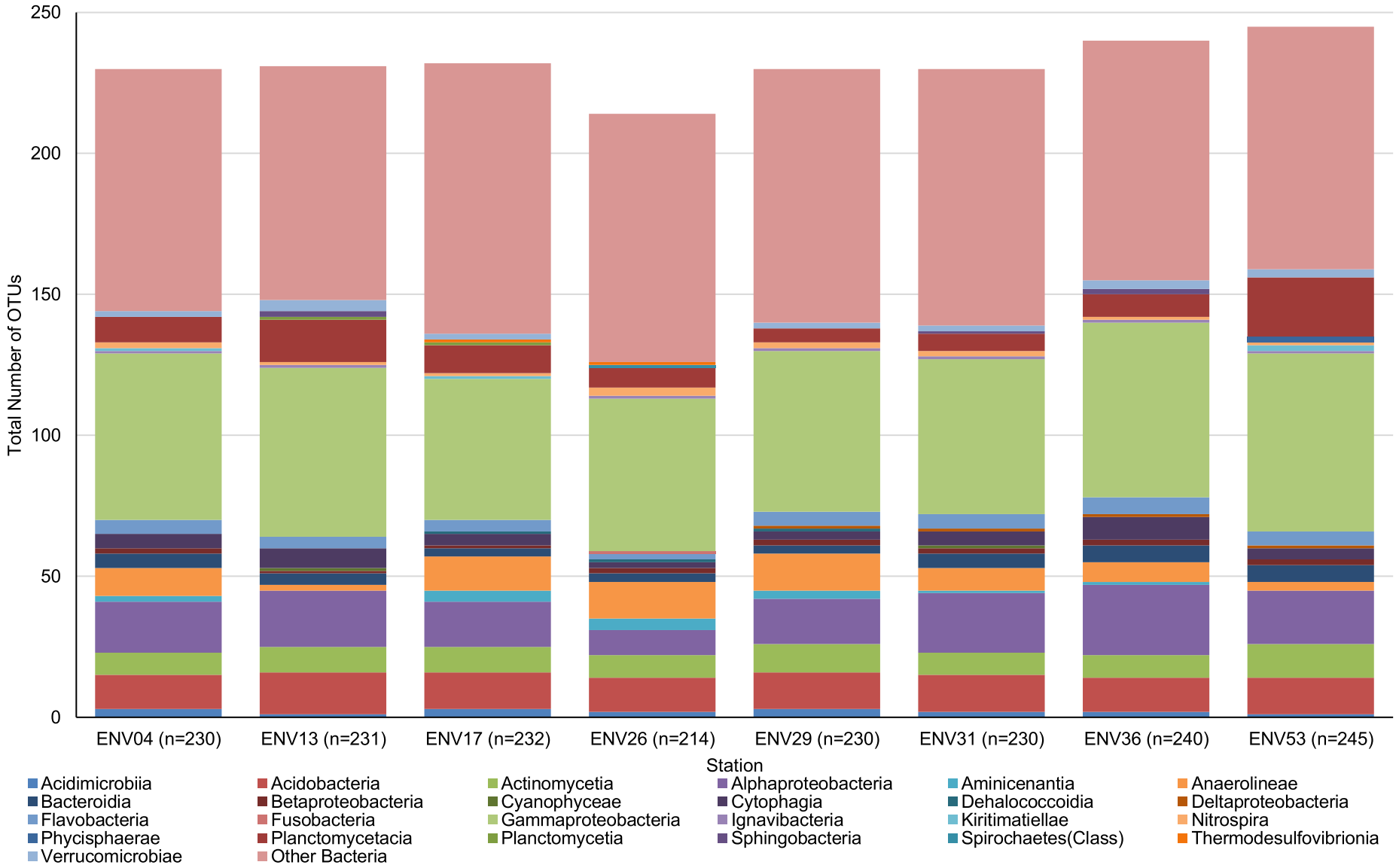
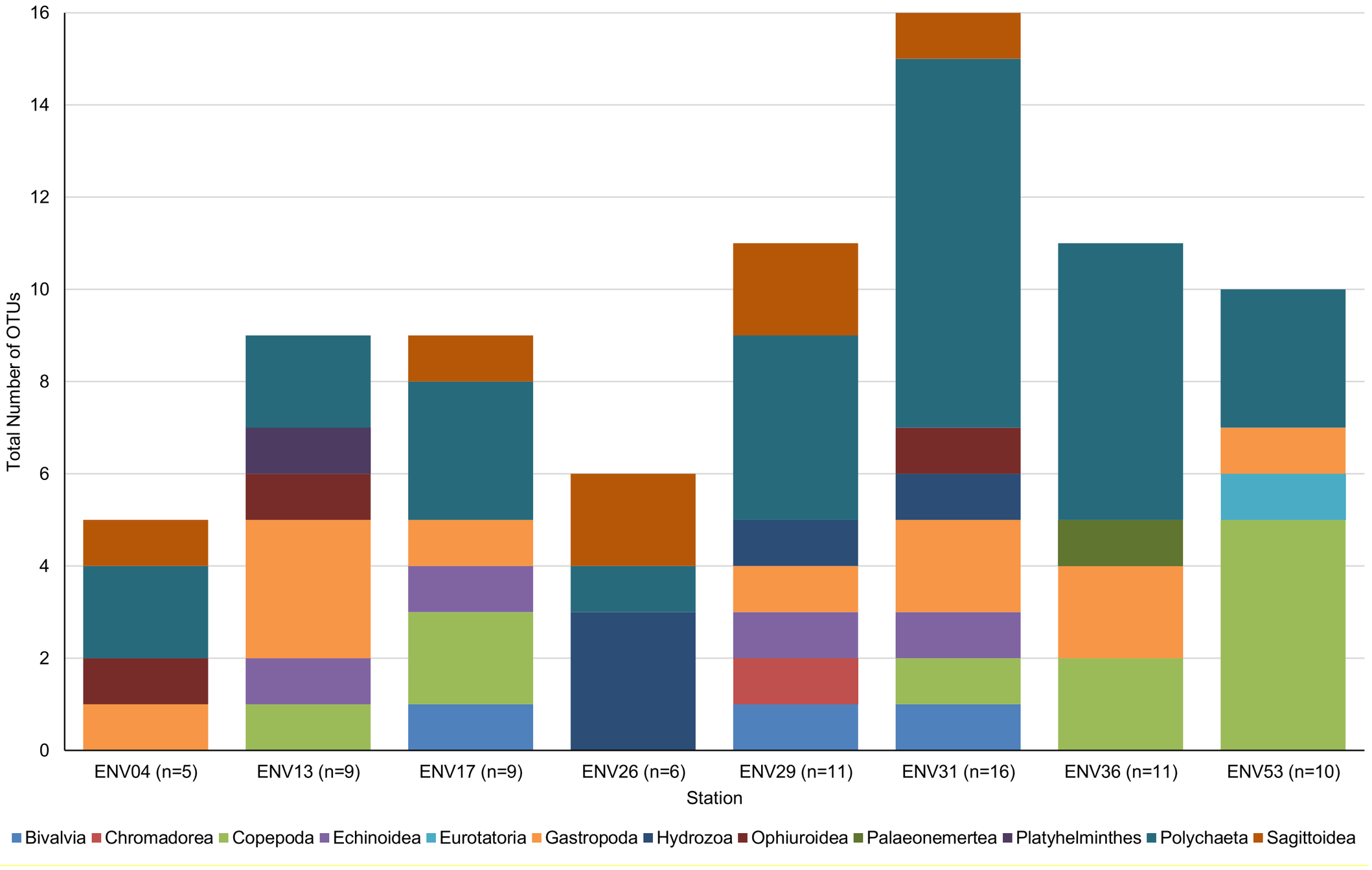


Figure 2.8 Contributions of Gross Sediment Infaunal OTU Taxonomic Groups by Station



Comparative taxonomic heat trees detailing the number of OTUs along the ECR from bacteria taxa down to the order rank is presented in Figure 2.23 while the taxonomic heat trees detailing discrete infaunal taxa OTUs down to the rank order are presented in Figure 2.24. The nodes (circles) represent taxon whilst the lines detail the hierarchical relationships between taxa. The colour scale and relative width of the nodes represent the number of OTUs for each taxon. Labels without nodes represent missing taxa. Summary statistics for the sediment bacterial and infaunal richness are detailed in Table 2.16.

Figure 2.9 Sediment Bacterial Taxonomic Heat Trees of the Number of OTUs

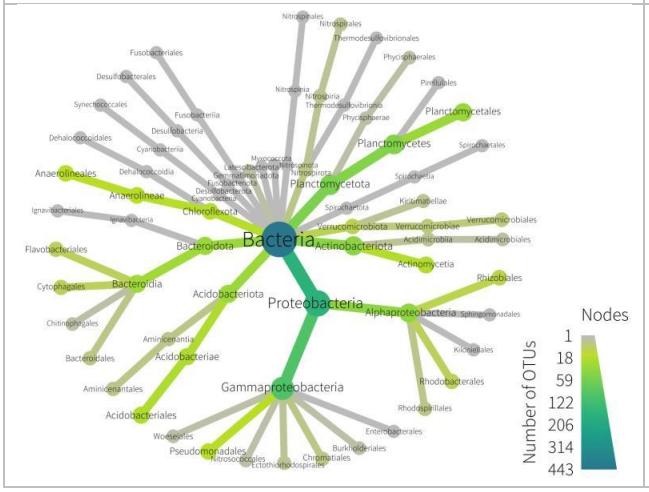



Figure 2.10 Sediment Infaunal Taxonomic Heat Trees of the Number of OTUs

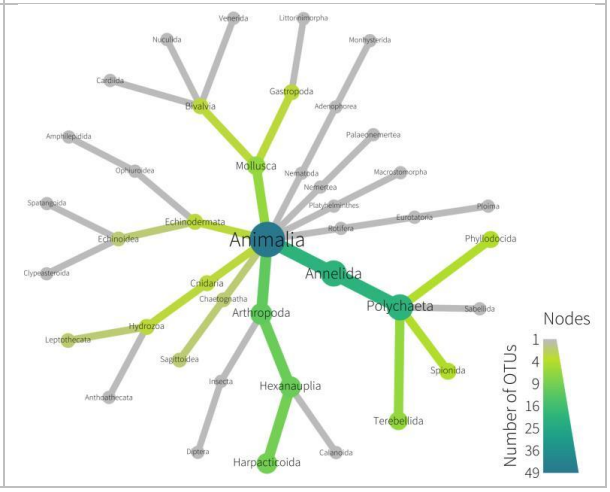



Table 2.16 Summary of Sediment (Bacterial and Infaunal) Richness

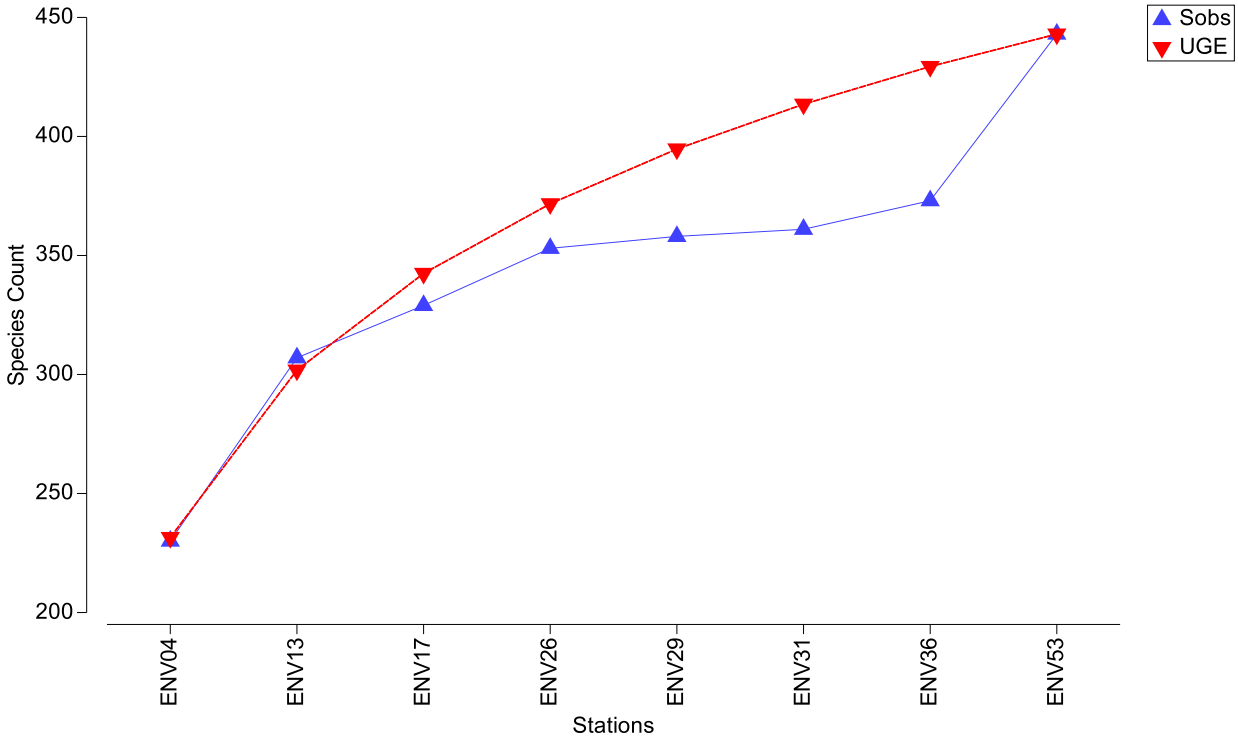
| | Bacterial | Infaunal |
|---|---|---|
| Minimum | 214 | 5 |
| Maximum | 245 | 16 |
| Mean | 232 | 10 |
| ±SD | 9 | 3.4 |

Accumulation plots of OTUs for the bacterial and infaunal data sets, for the array area are presented in Figure 2.11 and Figure 2.12, respectively. Two lines are plotted; the first (plotted in blue and often referred to as a Sobs curve) adds the new taxa to those already recorded, in sample order. The second line (plotted in red and often referred to as the UGE curve) is smooth, as it is an average output based on the samples being added in a random order 999 times (Ugland *et al.*, 2003). Notable changes in the slope of the species in order of observation (Sobs) curve compared to the UGE curve can be an indication of differences in the community composition. Further, the relative position of the Sobs curve to that of the UGE curve can reflect the number of OTUs versus expectations had all samples been equal.

The Sobs curve for the sediment bacteria data set (Figure 2.11) began below the UGE curve with the addition of the first station (Station ENV04). The addition of 77 new OTUs at Station ENV13 raised the Sobs curve relatively steeply, placing it above the UGE curve for that station only. The remaining stations returned fewer than expected new OTUs until the addition of the final station (ENV53) with 70 new OTUs. These results indicate that the bacterial communities at the two shallowest stations (ENV13 and ENV53) were relatively distinct from the stations in deeper water.

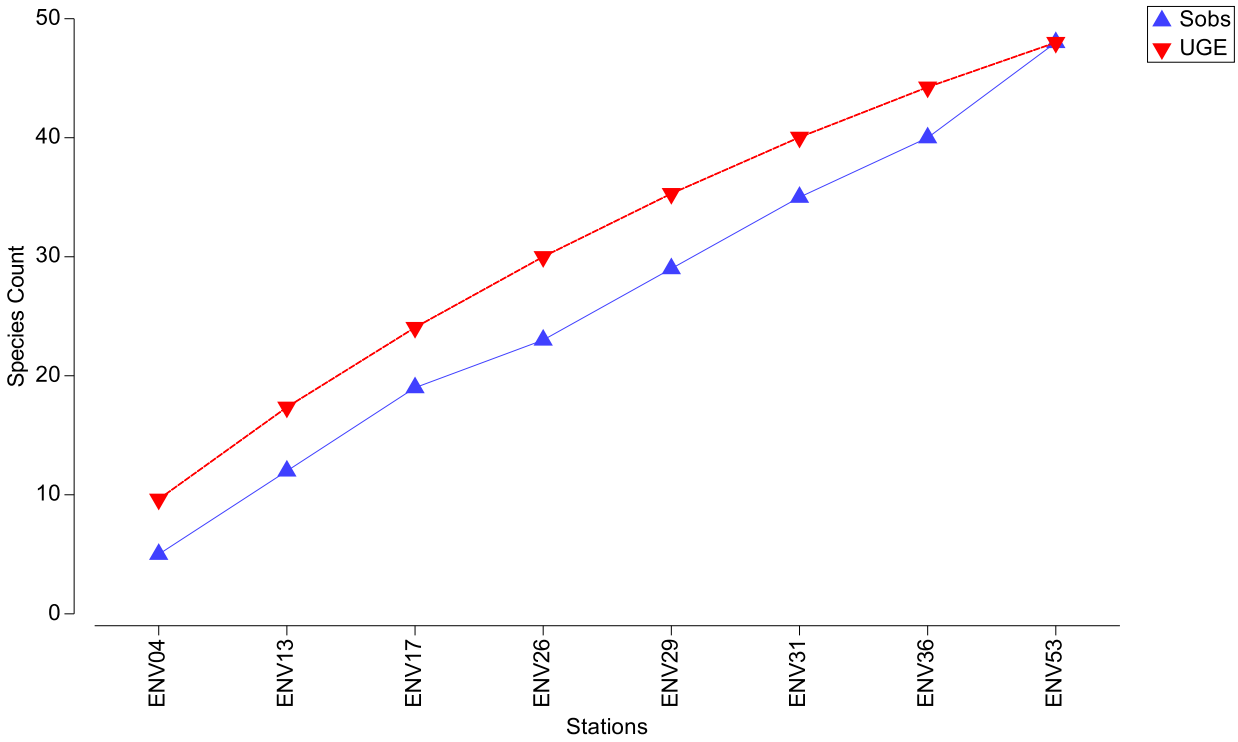
The Sobs and UGE curve of the sediment bacterial data OTU accumulation plot for the ECR continued to rise with the addition of the last samples. This reflected that further samples across the ECR may elicit additional OTUs to those reported during the current sampling campaign.

Figure 2.11 Bacterial OTU Accumulation Curve




The Sobs curve for the ECR sediment infaunal data set (Figure 2.12) began below the UGE curve, and rose parallel with it until the addition of the last sample, indicating that fewer OTUs were present at Station ENV04 than was to be expected and that the infaunal community at the shallowest station (ENV53) was relatively distinct. With the Sobs and UGE curves continuing to rise at a consistent rate (UGE; OTUs). This reflected that analysis of samples from the other 32 sampled stations along the ECR may elicit additional OTUs to those reported.

Figure 2.12 Infaunal OTU Accumulation Curve



### 2.10.4 Summary Statistics for Water Metabarcoding

A total of 72 operational taxonomic units (OTUs) were detected from water samples along the ECR as detailed in Table 2.17. Full read count of the OTUs detected per statins are tabulated in Appendix L.

*Fish*

The fish eDNA data set identified 17 taxonomic groups based on family with the proportional contribution of each of these taxonomic families to the overall structure of the ECR detailed in Table 2.18 and presented for each station and sample in Figure 2.13 and Figure 2.14, respectively.

Of the 16 samples acquired across 8 stations for the fish eDNA water analysis, 8 samples contained amplifiable DNA. Station ENV36 did not recover samples with any amplifiable DNA, whereas both samples from Station ENV53 recovered amplifiable eDNA. One sample from each of the remaining stations contained amplifiable DNA and these were typically the bottom sample, other than at Station ENV04, where only the surface sample recovered amplifiable DNA. Gadidae and Pleuronectidae (both; n=5, 17%) were the most detected taxonomic families with Cottidae (n=3, 10%), the next most detected group. In addition, eleven taxonomic families were represented by a single OTU.

Of the 30 fish OTUs obtained from the water samples, 12 (40%) were present in a single sample, with none present at every station.

*Vertebrates*

The vertebrate eDNA data set identified 29 taxonomic groups based on family. Contributions of the taxonomic families to the overall structure of the survey area are detailed in Table 2.19 and presented for each station and sample in Figure 2.15 and Figure 2.16, respectively.

All samples acquired along the ECR for vertebrate eDNA analysis contained amplifiable DNA. Gadidae and Pleuronectidae (both; n=4, 10%) were consistent with the fish eDNA analysis being the most detected taxonomic families with Agonidae, Ammodytidae, Callionymidae, Cottidae, Delphinidae, Lotidae and Syngnathidae each being represented by two OTUs (5%) and the second most detected groups by family. Additionally, the remaining 20 taxonomic families were represented by a single OTU.

Of the 42 vertebrate OTUs obtained from the water samples, 20 (48%) were present in a single sample, 5 (12%) were present at every station, of which 3 (7%) were present in every sample.

Table 2.17 OTU Water Detections per Target and Percentage Successfully Classified

| Target | Number of Stations Analysed | Number of Stations containing OTUs | Number of OTUs | Phylum (%) | Class (%) | Order (%) | Family (%) | Genus (%) | Species (%) |
|---|---|---|---|---|---|---|---|---|---|
| Fish (water) | 8 | 7 | 30 | 100 | 100 | 100 | 100 | 90 | 90 |
| Vertebrates (water) | 8 | 8 | 42 | 100 | 100 | 100 | 100 | 86 | 74 |

Table 2.18 Contribution of Gross Water Fish OTU Taxonomic Families

| Group by Class | Reads | | OTUs | |
|---|---|---|---|---|
| | Number | Proportional Contribution % | Abundance | Proportional Contribution % |
| Agonidae | 30672 | 4 | 1 | 3 |
| Ammodytidae | 120253 | 14 | 1 | 3 |
| Argentinidae | 625 | <1 | 1 | 3 |
| Blenniidae | 1376 | <1 | 1 | 3 |
| Callionymidae | 853 | <1 | 2 | 7 |
| Clupeidae | 258396 | 30 | 2 | 7 |
| Cottidae | 75053 | 9 | 3 | 10 |
| Cyclopteridae | 3224 | <1 | 1 | 3 |
| Gadidae | 114341 | 13 | 5 | 17 |
| Gobiidae | 1213 | <1 | 2 | 7 |
| Liparidae | 58 | <1 | 1 | 3 |
| Pholidae | 10044 | 1 | 1 | 3 |
| Pleuronectidae | 223732 | 26 | 5 | 17 |
| Salmonidae | 1667 | <1 | 1 | 3 |
| Scombridae | 827 | <1 | 1 | 3 |
| Scophthalmidae | 17477 | 2 | 1 | 3 |
| Triglidae | 13631 | 2 | 1 | 3 |
| **Total** | **873442** | **100** | **30** | **100** |

Table 2.19 Contribution of Gross Water Vertebrate OTU Taxonomic Families

| Group by Class | Reads | | OTUs | |
|---|---|---|---|---|
| | Number | Proportional Contribution % | Abundance | Proportional Contribution % |
| Agonidae | 387 | <1 | 2 | 5 |
| Alosidae | 16 | <1 | 1 | 2 |
| Ammodytidae | 76289 | 38 | 2 | 5 |
| Argentinidae | 447 | <1 | 1 | 2 |
| Blenniidae | 177 | <1 | 1 | 2 |
| Callionymidae | 389 | <1 | 2 | 5 |
| Clupeidae | 9357 | 5 | 1 | 2 |
| Cottidae | 3672 | 2 | 2 | 5 |
| Cyclopteridae | 285 | <1 | 1 | 2 |
| Cyprinidae | 13 | <1 | 1 | 2 |
| Delphinidae | 36 | <1 | 2 | 5 |
| Gadidae | 41996 | 21 | 4 | 10 |
| Gasterosteidae | 75 | <1 | 1 | 2 |
| Gobiidae | 26 | <1 | 1 | 2 |
| Labridae | 25 | <1 | 1 | 2 |
| Liparidae | 75 | <1 | 1 | 2 |
| Lotidae | 1920 | <1 | 2 | 5 |
| Phocidae | 289 | <1 | 1 | 2 |
| Phocoenidae | 2481 | 1 | 1 | 2 |
| Pholidae | 837 | <1 | 1 | 2 |
| Pleuronectidae | 22895 | 11 | 4 | 10 |
| Salmonidae | 16 | <1 | 1 | 2 |
| Scombridae | 39 | <1 | 1 | 2 |
| Scophthalmidae | 36132 | 18 | 1 | 2 |
| Soleidae | 59 | <1 | 1 | 2 |
| Stichaeidae | 383 | <1 | 1 | 2 |
| Syngnathidae | 46 | <1 | 2 | 5 |
| Triglidae | 773 | <1 | 1 | 2 |
| Zoarcidae | 29 | <1 | 1 | 2 |
| **Total** | **199164** | **100** | **42** | **100** |

Figure 2.13 Contributions of Gross Water Fish OTU Taxonomic Families by Station

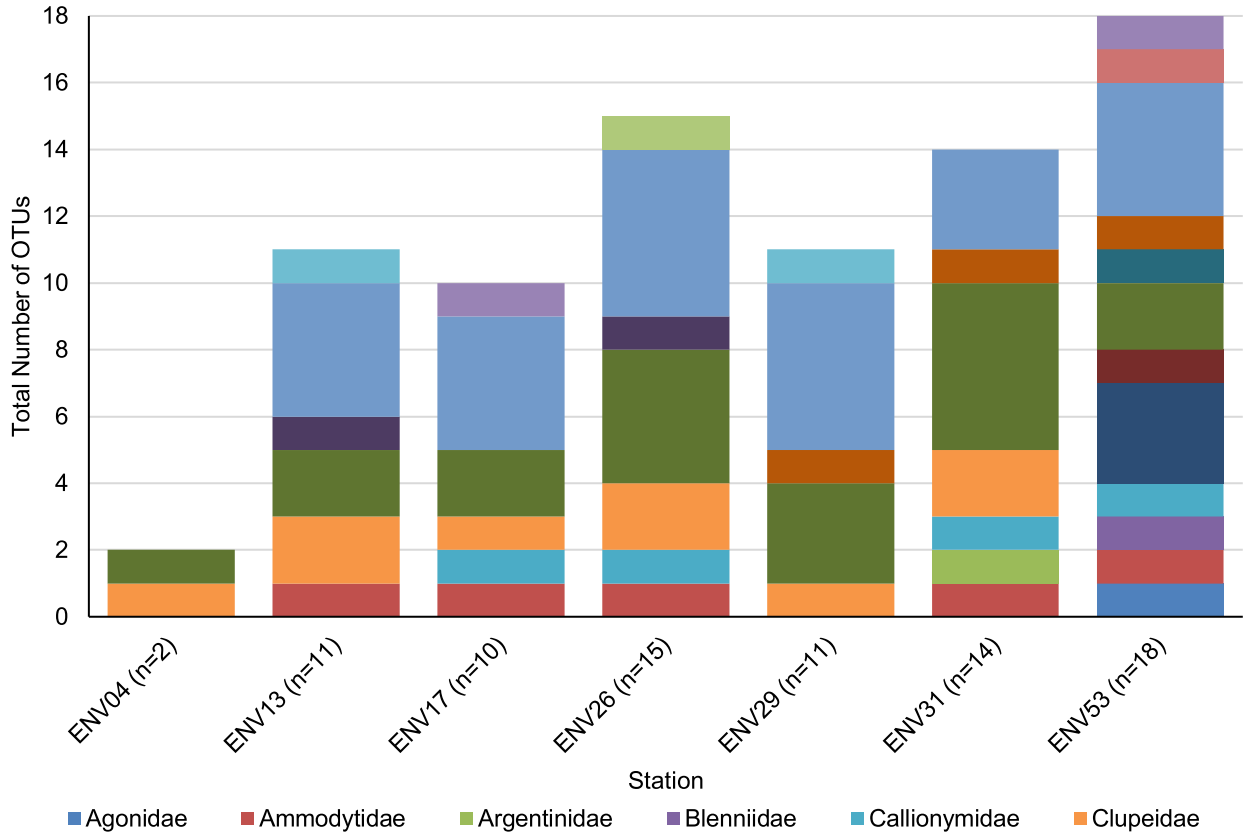



Figure 2.14 Contributions of Gross Water Fish OTU Taxonomic Families by Sample

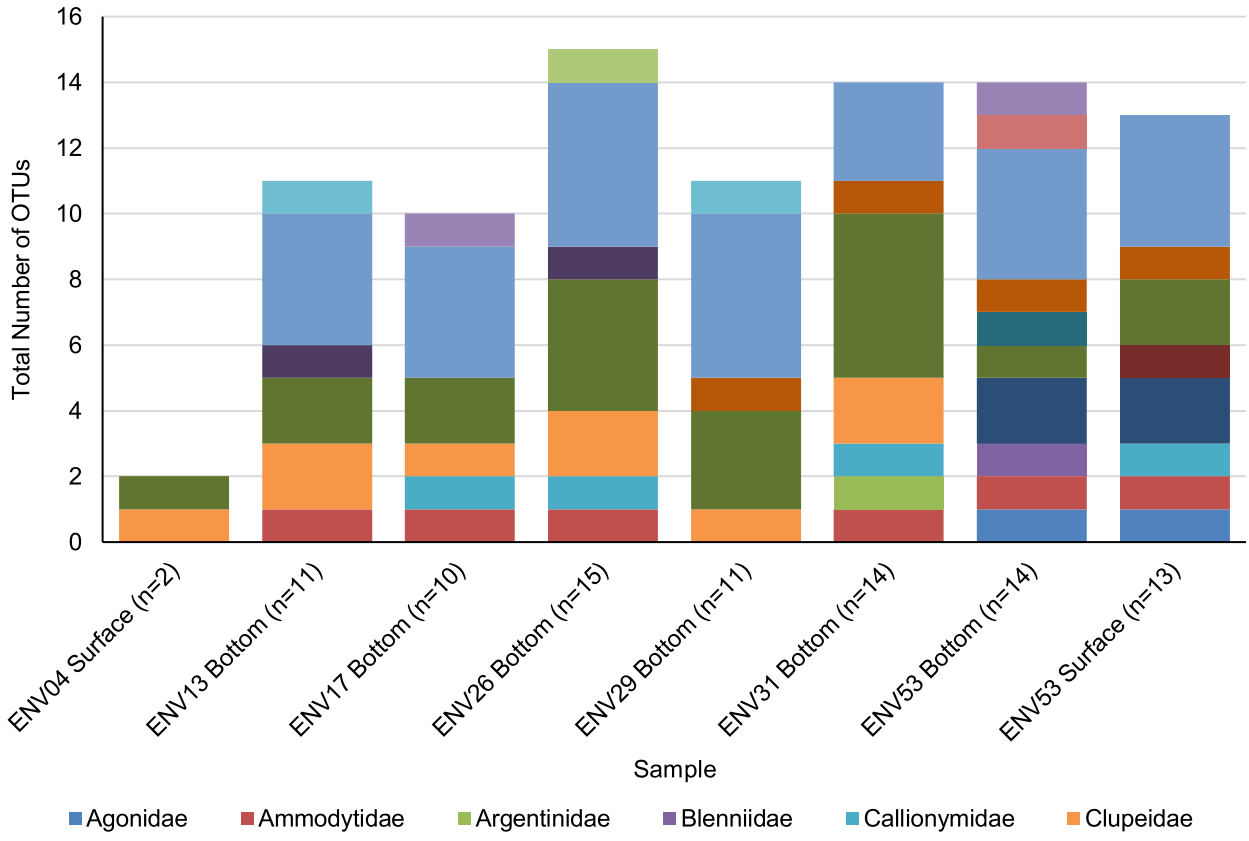


Figure 2.15 Contributions of Gross Water Vertebrate OTU Taxonomic Families by Station

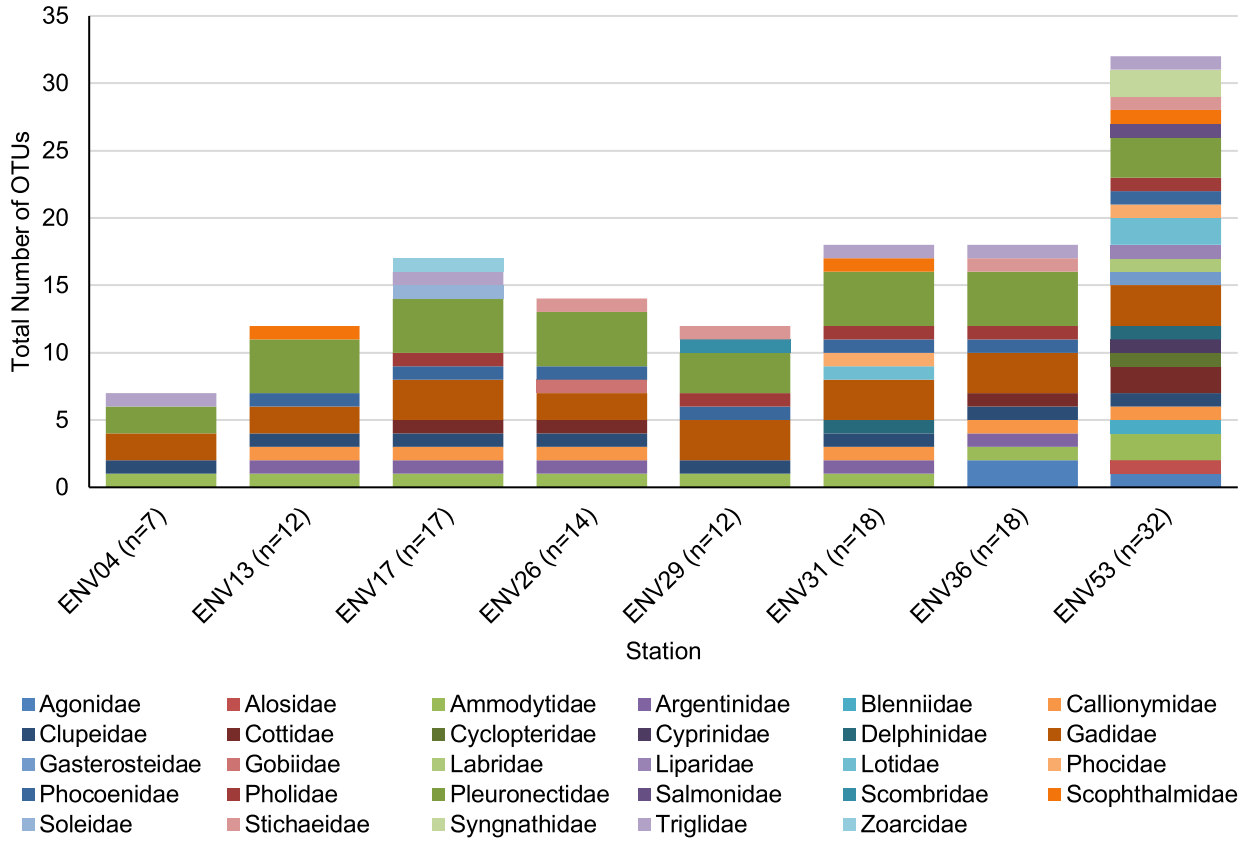
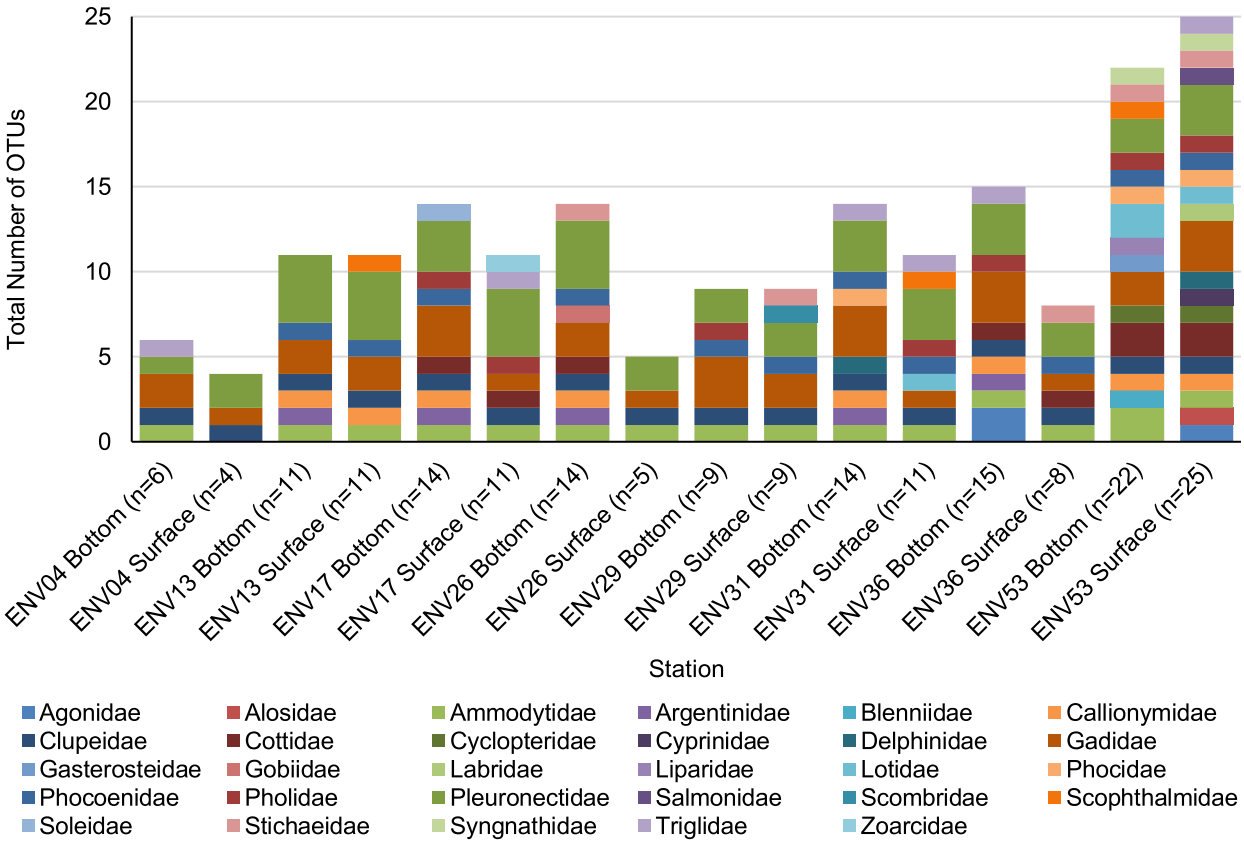



Figure 2.16 Contributions of Gross Water Vertebrate OTU Taxonomic Families by Sample



Comparative taxonomic heat trees detailing the number of OTUs across the ECR from fish taxa down to the order rank is presented in Figure 2.17 while the taxonomic heat trees detailing vertebrate taxa OTUs down to the rank order are presented in Figure 2.18. Summary statistics for the water fish and vertebrate richness are detailed in Table 2.20.

Figure 2.17 Water Fish Taxonomic Heat Trees of the Number of OTUs

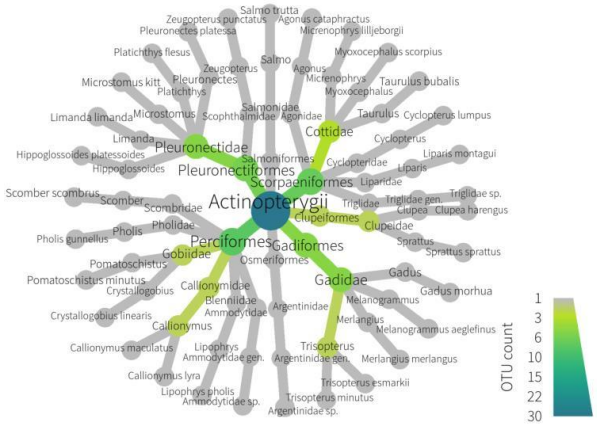



Figure 2.18 Water Vertebrate Taxonomic Heat Trees of the Number of OTUs

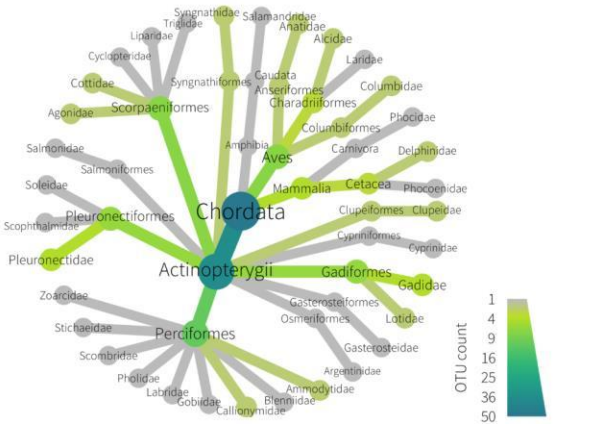


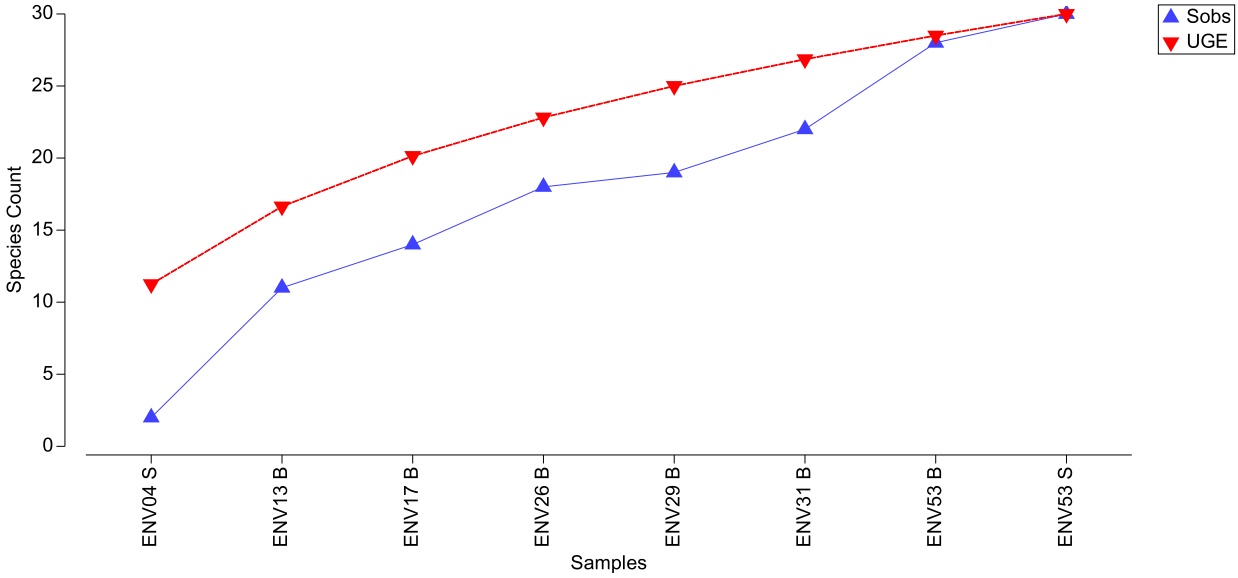

Table 2.20 Summary of Water (Fish and Vertebrate) Richness

| | Fish | Vertebrate |
|---|---|---|
| Minimum | 2 | 7 |
| Maximum | 30 | 42 |
| Mean | 14 | 19 |
| ±SD | 8 | 11 |

Accumulation plots of OTUs for the fish and vertebrate data sets, along the ECR are presented in Table 2.19 and Table 2.20.

The Sobs curve for the water fish data set (Figure 2.19) began below the UGE, but rose relatively steeply with the addition of the shallowest stations (ENV13 and ENV53), indicating that fewer OTUs were present at Station ENV04 than was to be expected and that the fish communities at the shallowest stations (ENV13 and ENV53), particularly in the bottom samples, were distinct from those at the remaining stations. The Sobs and UGE curve of the water fish data OTU accumulation plot for the ECR continued to rise with the addition of the last sample. This reflected that further samples across the array area may elicit additional OTUs to those reported during the current sampling campaign.

Figure 2.19 Fish OTU by Sample Accumulation Curve

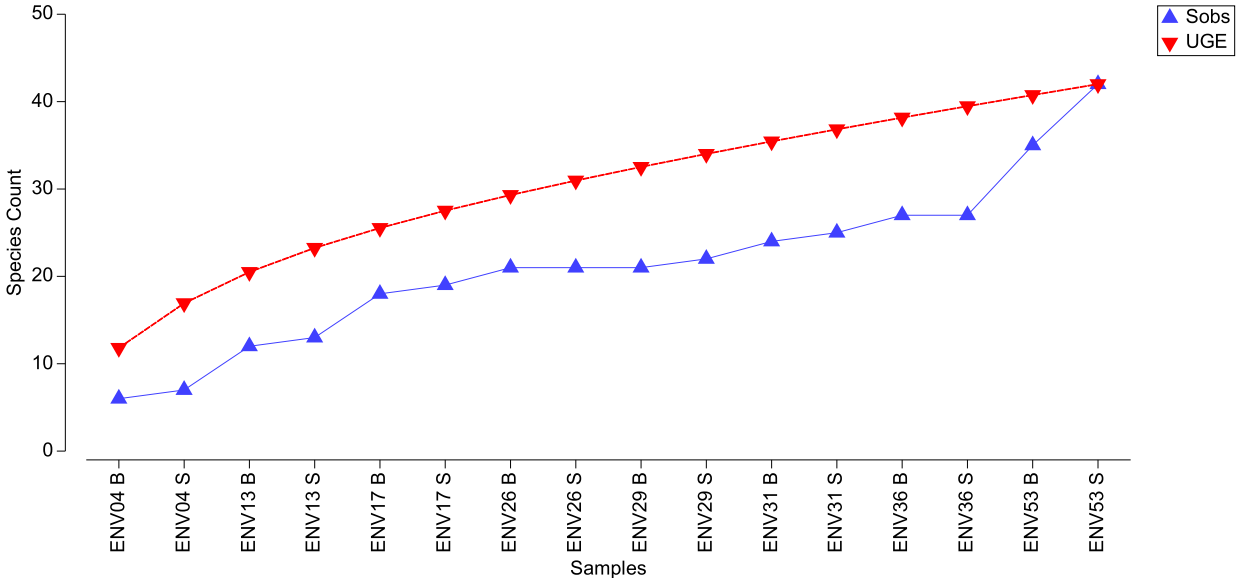



S Surface sample B Bottom sample

The Sobs curve for the ECR water vertebrate data set (Figure 2.20) reflected a similar pattern to the fish data set with the curve beginning and remaining below the UGE curve. However, it rose relatively steeply with the addition of bottom samples from Stations ENV13 and ENV17 and both samples from Station ENV53. The low start to the Sobs curve, indicates that fewer OTUs were present at Station ENV04 than was to be expected. The relative flatness of the Sobs curve with the addition of each surface sample indicates that these were less diverse and/or added relatively few new OTUs compared with the bottom samples, other than at Station ENV29. The relative steepness of the Sobs curve at the shallowest stations (ENV13 and ENV53) and the relatively nearshore Station ENV17 indicate that the vertebrate communities at these stations were distinct from those at the remaining stations.

With the Sobs and UGE curves continuing to rise with the addition of the last samples, further samples across the ECR may elicit additional OTUs to those reported during the current sampling campaign.

Figure 2.20 Vertebrate OTU by Sample Accumulation Curve



### 2.10.5 Sediment OTU Community Structure using Multivariate Analyses

Multivariate analyses enable subtle trends within the data sets to be identified. Bray-Curtis similarity matrices were produced from the standardised data using PRIMER v7. Rather than applying the conservative approach of presence absence, the decision was made to used standardised reads as a proxy for relative abundance to maximise use of the available data. A SIMPROF permutation test was conducted in conjunction with CLUSTER analysis and the results illustrated on a dendrogram. Red lines join samples that are statistically indistinguishable, whilst black lines join samples which are distinct from one another. A nMDS routine was also run. The results of the CLUSTER analysis including SIMPROF analysis in the form of a Bray-Curtis similarity dendrogram and nMDS plot for the sediment bacteria samples are displayed in Figure 2.21.

*Bacteria*

The CLUSTER analysis and resulting dendrogram for the ECR sediment bacterial OTU data set (Figure 2.21a) identified six SIMPROF groups which comprised four outliers (SIMPROF *a* ENV53, *b* ENV13, *c* ENV26, and *d* ENV17) and two closely associated pairs (SIMPROF *e* (ENV04 and ENV29) and *f* (ENV31 and ENV36). All the samples were more similar than dissimilar to one another (similarity >50%) with the exception of Station ENV53 which was <28% similarity to any other station. The key OTUs and classes responsible for the multivariate pattern in the bacterial eDNA data set are displayed in Table 2.21, based on SIMPER analysis and review of the raw data.

Numerous OTUs each made a small contribution towards the separation of the groups from the remaining stations. This may be due to the bacterial communities being far richer than equivalent metazoan communities and less discriminately bound to the sediment given their established variation with both overlying water quality along with direct sediment physico-chemistry (Allison & Martiny, 2008; Frühe *et al.*, 2021). However, they still provide a suitable sensitive receptor to environmental pressures for monitoring impacts (Horton *et al.*, 2019).

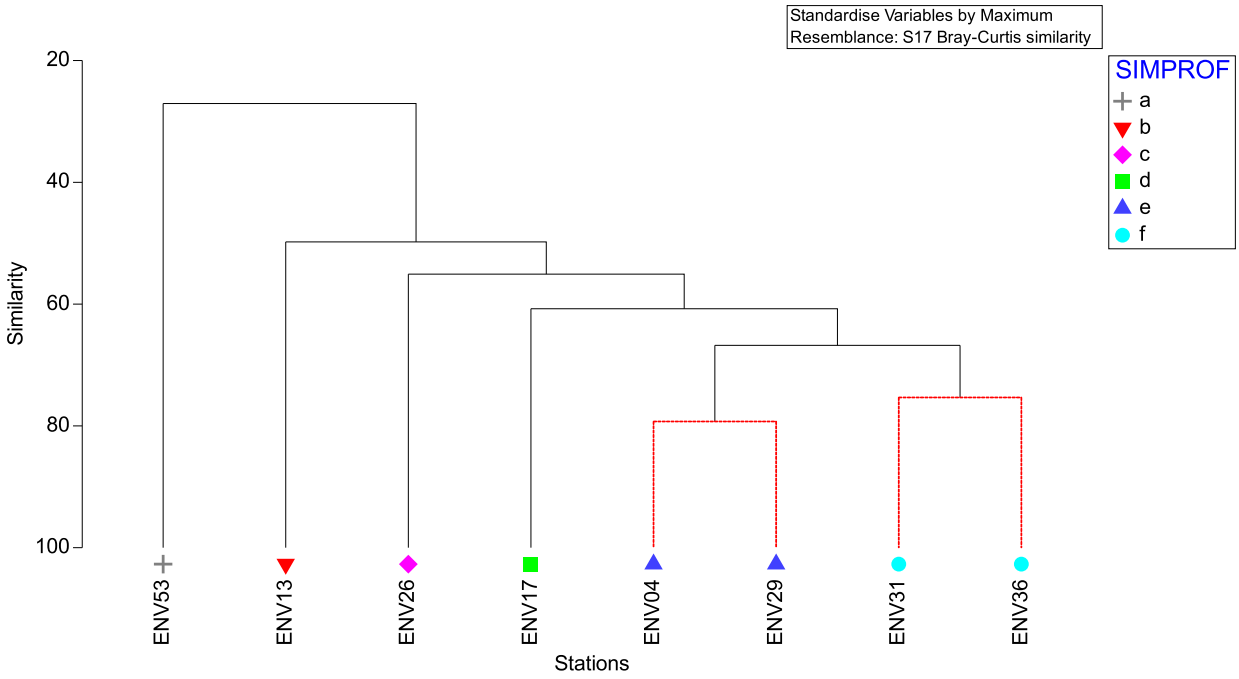
The nMDS ordination of the ECR sediment bacterial sample data (Figure 2.21b) revealed a similar pattern to the CLUSTER analysis, with a stress level of 0, this can be considered a perfect representation of the rank dis(similarities) and overall pattern observed in the data set, which broadly corresponds with changes in water depth across the ECR.

*Infauna*

CLUSTER analysis for the ECR sediment infaunal OTU data set found no significant differences between the stations, despite them all recording less than 22% Bray-Curtis similarity with one another. This can largely be attributed to the relatively sparse data set. As with the bacterial data set, Station ENV53 was the most dissimilar station in terms of its infaunal community, recorded a Bray-Curtis similarity of <2% with the remaining stations.

## Figure 2.21 Multivariate Analysis of Sediment Bacterial OTU Data by Station

a) Bray-Curtis Similarity Dendrogram




b) MDS Ordination with Symbols Indicating 10m Depth Zone

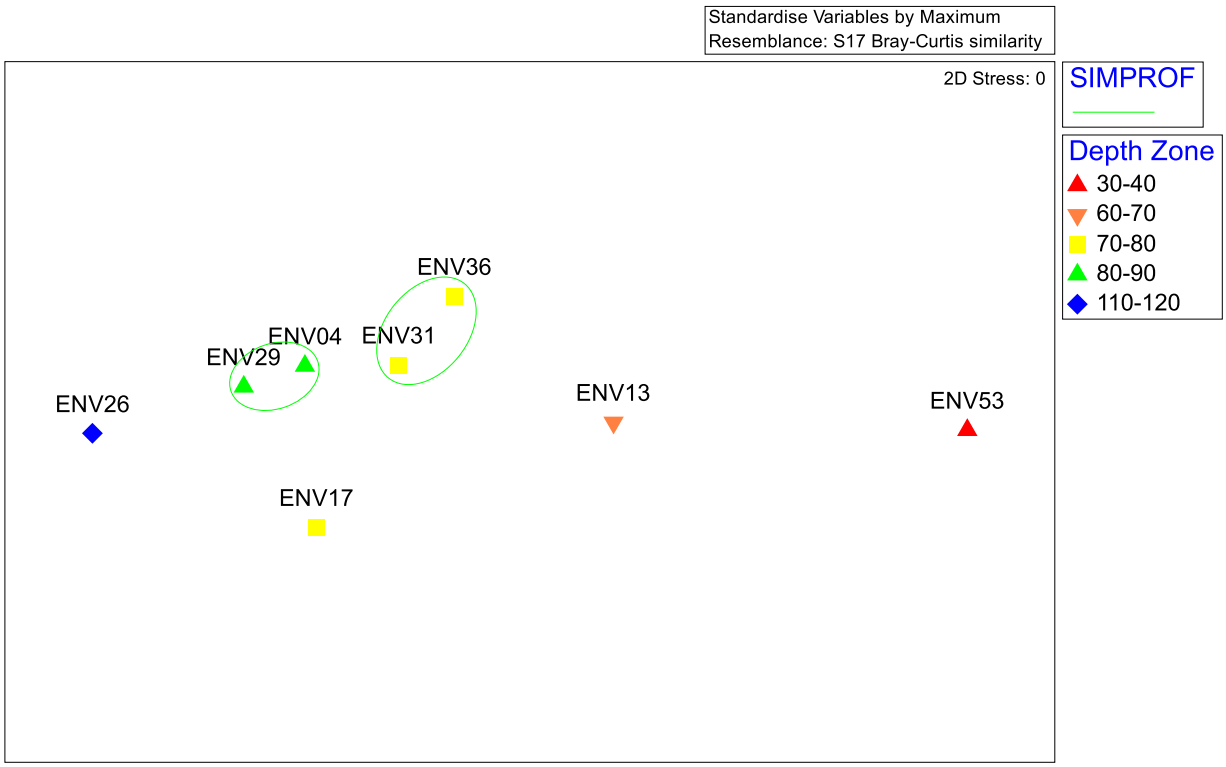


Table 2.21 Taxa Influencing Sediment Bacteria OTU SIMPROF Variation

| Stations | SIMPROF | Similarity (Bray-Curtis %) | Taxa Influencing Station Separation |
|---|---|---|---|
| ENV53 | SIMPROF *a* vs *b-f* | 27.06 | • Unique presence of 70 OTUs (including 24 Proteobacteria OTUs), accounting for 16% of the OTUs along the ECR.<br>• 19% of OTUs recorded higher reads (84 OTUs including 27 Proteobacteria OTUs).<br>• No reads of 49 OTUs (including 18 Proteobacteria OTUs), accounting for 11% of OTUs along the ECR.<br>• 6 OTUs recorded lower reads accounting for 1% of the OTUs, of which 5 OTUs were Proteobacteria. |
| ENV13 | SIMPROF *b* vs *c-f* | 49.79 | • Unique presence of 26 OTUs (including 9 Planctomycetes and 8 Proteobacteria), accounting for 13% of the OTUs along the ECR.<br>• 18% of OTUs recorded higher reads (78 OTUs including 35 Proteobacteria OTUs and 10 Planctomycetes OTUs).<br>• No reads of 62 OTUs (including 17 Proteobacteria OTUs and 8 Chloroflexi OTUs), accounting for 14% of the OTUs along the ECR.<br>• 13 OTUs recorded lower reads accounting for 3% of the OTUs (including 6 Proteobacteria OTUs and 3 Bacteroidetes OTUs). |
| ENV26 | SIMPROF *c* vs *d-f* | 55.07 | • Unique presence of 15 OTUs (including 5 Proteobacteria OTUs and 2 Planctomycetes OTUs), accounting for 3% of the OTUs along the ECR.<br>• 16% of OTUs recorded higher reads (71 OTUs including 11 Chloroflexi OTUs and 9 Acidobacteria OTUs).<br>• No reads of 42 OTUs (including 21 Proteobacteria OTUs) accounting for 9% of OTUs along the ECR.<br>• 10 OTUs recorded lower reads accounting for 2% of the OTUs (including 2 Actinobacteriota OTUs and 2 Bacteroidetes OTUs). |
| ENV17 | SMPROF *d* vs *e*, *f* | 60.76 | • Unique presence of 18 OTUs (including 4 Planctomycetes OTUs and 3 Acidobacteria OTUs), accounting for 4% of the OTUs along the ECR.<br>• 15% of OTUs recorded higher reads (65 OTUs, including 13 Actinobacteriota OTUs and 13 Acidobacteria OTUs).<br>• No reads of 41 OTUs (including 21 Proteobacteria OTUs and 6 Bacetroidetes OTUs), accounting for 9% of OTUs along the ECR.<br>• 5 OTUs recorded lower reads accounting for 1% of the OTUs, of which 4 OTUs were Proteobacteria. |
| ENV04, ENV29 | SIMPROF *e* vs *f* | 66.77 | • Unique presence of 18 OTUs (including 9 Proteobacteria OTUs and 5 Chloroflexi OTUs), accounting for 4% of the OTUs along the ECR.<br>• 7% of OTUs recorded higher reads (32 OTUs, including 16 Proteobacteria OTUs and 6 Bacteroidetes OTUs).<br>• No reads of 32 OTUs (including 8 Proteobacteria OTUs and 4 Bacteroidetes OTUs), accounting for 7% of the OTUs along the ECR.<br>• 16 OTUs recorded lower reads accounting for 4% of the OTUs (including 8 Proteobacteria OTUs and 4 Bacteroidetes OTUs). |
| ENV31, ENV36 | SIMPROF *f* | NA | NA |

### 2.10.6 Water OTU Community Structure using Multivariate Analyses

The water multivariate analyses were produced from the standardised data in PRIMER v7. A SIMPROF permutation test was conducted in conjunction with CLUSTER analysis and the results illustrated on a dendrogram. In addition, a nMDS routine was also run.

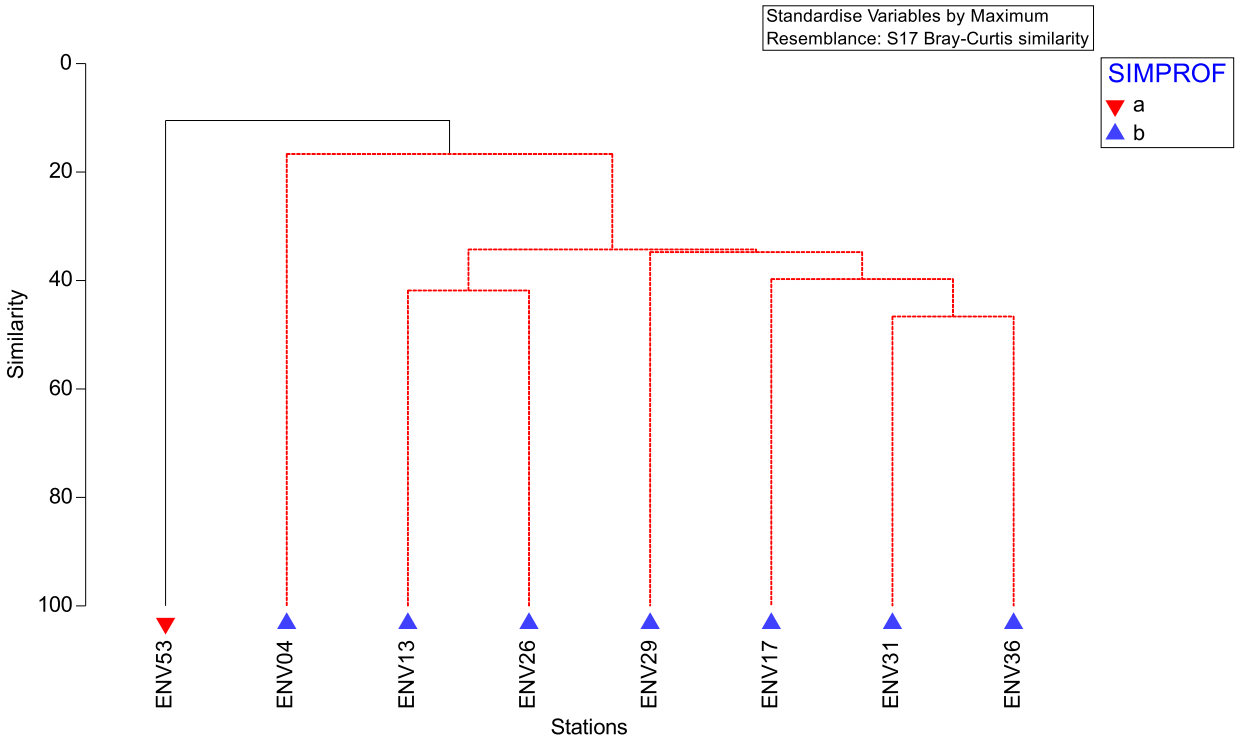
*Fish*

The cluster analysis of the ECR water fish OTU data set found no significant differences between the stations or samples, despite them all recording less than 38% Bray-Curtis similarity with one another. This can largely be attributed to the relatively sparse data set, with the surface sample from Station ENV04 being the most dissimilar in terms of its fish community, recording a Bray-Curtis similarity of less than 14% with the remaining stations and samples.

*Vertebrates*

CLUSTER analysis and the resulting dendrogram for the ECR water vertebrate OTU station data set (Figure 2.22) identified two groups, all of which were more dissimilar than similar (*i.e.* Bray-Curtis similarity of less than 50%). Station ENV53 (SIMPROF *a*) with a similarity of 11% included 15 unique OTUs accounting for 36% of the OTUs along the ECR. These consisted of two OTUs from Syngnathidae and one OTU from the remaining thirteen families.

Figure 2.22 Multivariate Analysis of Water Vertebrate OTU Data by Station




## 2.10.7 Multivariate Comparison of Sediment Metabarcoding Results to Physico-chemical Data

The bacterial and infaunal eDNA multivariate patterns were compared to the physico-chemical data to determine if any patterns correlated. All the eight stations analysed for sediment eDNA also had a full suite of physio-chemistry analysed.

A RELATE analysis identified a 72% correlation between the sediment bacteria eDNA multivariate pattern and that of the physico-chemical variables. BV STEP analyses further identified a sub-set of five physico-chemical variables (fines, gravel, n-alkanes, As and Zn) which showed a 92% correlation with the sediment bacteria eDNA multivariate pattern, with fines alone showing an 86% correlation with the sediment bacteria eDNA multivariate pattern.

A RELATE analysis identified a 48% correlation between the sediment infaunal eDNA multivariate pattern and that of the physico-chemical variables. BV STEP analyses further identified a sub-set of five physico-chemical variables (mean grain size, fines, n-alkanes, As and Zn) which showed a 73% correlation with the sediment infaunal eDNA multivariate pattern, with fines alone showing a 72% correlation with the sediment infaunal eDNA multivariate pattern.

An analysis of similarity (ANOSIM) was conducted on both the bacterial and infaunal eDNA data sets to investigate the association with depth (divided into 10m zones). This revealed a significant but low-level

correlation with the bacterial eDNA data set ($r=0.646$, $p<0.05$) and no such relationship was evident with the infaunal eDNA data set.

Further sampling, including additional stations and replication would allow further investigation of the relationship between bacterial and infaunal OTU data and the physico-chemical variables. As a result of the current sample size (n=39, of which 8 stations had concurrent physico-chemical, bacterial and infaunal eDNA) and use of single eDNA replicates per station the statistical robustness of the analysis patterns is limited and may be obscured.

## 2.11 Macrofaunal Interpretation

### 2.11.1 Overview

Two 0.1m$^2$ faunal samples (labelled MFA and MFB) were collected from each of 39 sampled stations, with MFA worked up and MFB retained and appropriately stored as a spare. All faunal samples were screened through a 1mm mesh sieve. Before analysing the data set provided by the laboratory, several taxa were removed as per our stated methods; however, all records, regardless of whether they were included in statistical analyses, are listed in Appendix M.

### 2.11.2 Summary of Notable Species

A single adult specimen of the bivalve *Devonia perrieri* was collected at Station ENV35 which is present on the Scottish Biodiversity List (NatureScot, 2020b). The adult recorded a biomass of 0.0028gm.

Two juveniles of the bivalve ocean quahog (*A. islandica*) were recorded (Stations ENV02 and ENV07) with an average biomass of 0.0016gm per individual. This species is on the OSPAR (2008) list of threatened and/or declining species and habitats and is listed as a low or limited mobility species PMF in Scottish offshore waters (NatureScot, 2020a). However, *A. islandica* is commonly found in this area of the North Sea, where populations of 40- to 80-year old specimens have been recorded, with a substantial proportion over 100 years old (OSPAR, 2009b).

Three individuals of the phosphorescent sea pen (*Pennatula phosphorea*) were recovered at Station ENV02 with a total biomass of 0.004gm. Sea pens are a component of the 'sea pen and burrowing megafauna communities' habitat which is classified as a threatened and/or declining habitat (OSPAR, 2008) and is a PMF in Scotland's seas (NatureScot, 2020b).

### 2.11.3 Abundance Summary Statistics

A total of 1896 individuals representing 247 taxa were recorded from 39 samples. Full enumeration of the taxa recorded per sample is tabulated in Appendix M. Of these, juveniles accounted for 2% of total individuals, 3% of taxa.

The presence of a large number of juveniles in the macrobenthos tends to be ephemeral due to high mortality and can temporarily disturb the normal balance of relative abundance amongst species (and consequentially measures of diversity). A RELATE analysis was conducted in PRIMER to determine whether the presence of juveniles caused significant differences between the rationalised full and adult only resemblance matrices. The tests showed the two data sets were 99.5% similar ($p<0.01$), indicating no significant differences between the multivariate pattern of the two data sets. No juvenile taxa were recorded in the top ten ranked taxa and therefore adult only data will be discussed in this report.

The data set was divided into five broad taxonomic groups: Annelida (Polychaeta), Arthropoda (Malacostraca), Mollusca, Echinodermata and 'Others'. The 'Others' category included Annelida (Sipuncula), Arthropoda (Pyconogonida), Cnidaria (Anthozoa), Foraminifera, Hemichordata, Nemertea, Phoronida and Platyhelminthes.

The absolute and proportional contributions of these five taxonomic groups to the overall community structure for the adult data set are summarised in Table 2.22. The contributions of each taxonomic group to total individuals and taxa are illustrated as stacked bar charts in Figure 2.23.

Table 2.22 Contribution of Gross Taxonomic Groups of Adults by Abundance

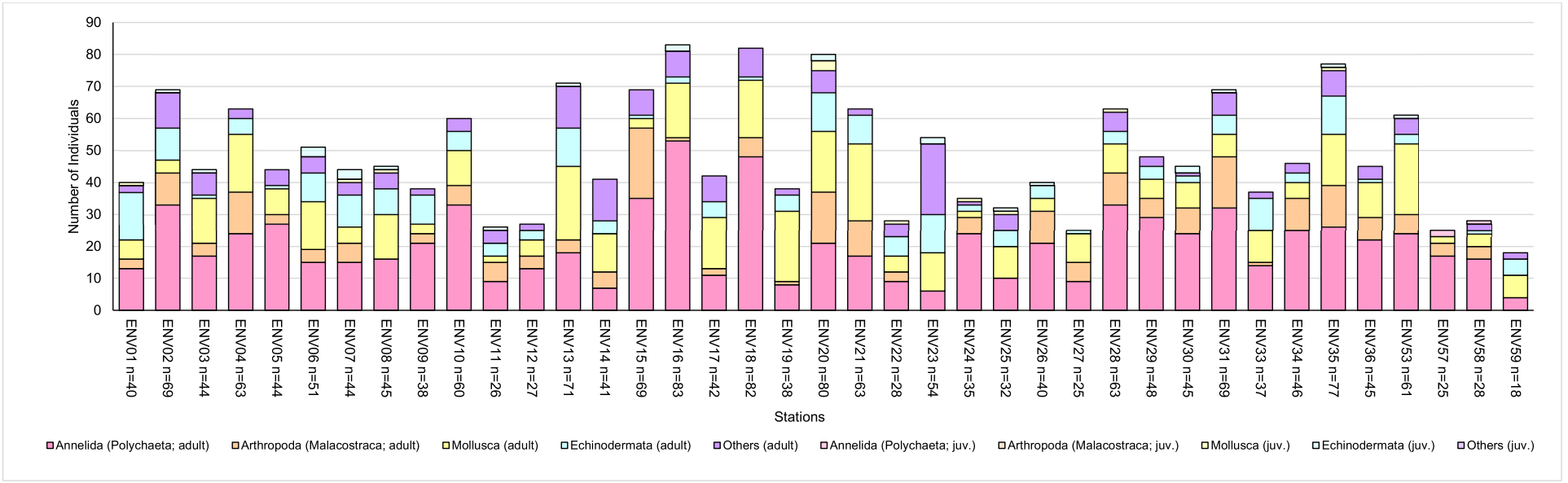
| Group | Adult Individuals | | Adult Taxa | |
|---|---|---|---|---|
| | Total | Proportional Contribution % | Total | Proportional Contribution % |
| Annelida (Polychaeta) | 799 | 43 | 106 | 44 |
| Arthropoda (Malacostraca) | 239 | 13 | 50 | 21 |
| Mollusca | 408 | 22 | 55 | 23 |
| Echinodermata | 213 | 11 | 15 | 6 |
| Others | 199 | 11 | 14 | 6 |
| **Total** | **1858** | **100** | **240** | **100** |

Annelida (Polychaeta; n=799) was the most abundant taxonomic group accounting for 43% of individuals and 44% of the taxa. Mollusca (n=408) was the second most abundant taxonomic group accounting for 22% of individuals and 23% of the taxa. Although Arthropoda (Malacostraca) was the third most abundant group (n=239), accounting for 13% of individuals, it was relatively diverse, responsible for 21% of taxa. By contrast, Echinodermata accounted for a similar proportion of the individuals (n=213, 11%), but only 6% of the taxa, reflecting relatively high abundances of four of the fifteen taxa within this group.

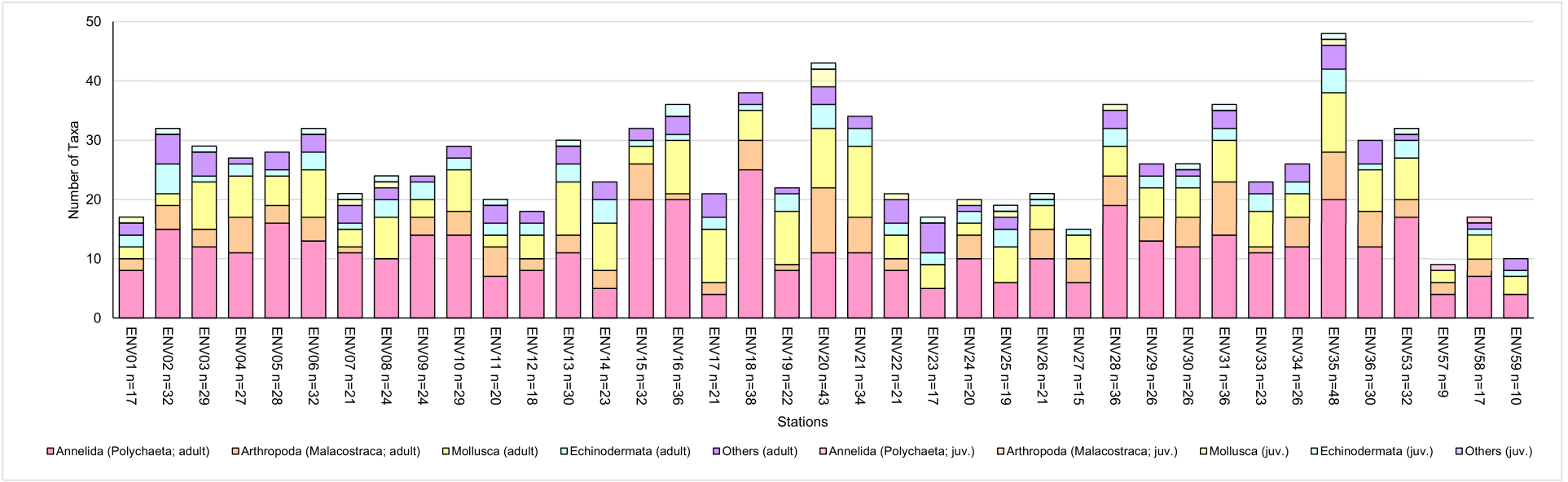
Of the 240 adult taxa recorded along the ECR, none was present at every station. The most widespread taxon was Nemertea, present at 25 of the 39 stations. A total of 98 taxa (41%) were recorded at a single station and of those 75 (31%) were represented by a single individual. It is generally accepted that ecological communities which are frequently subjected to local disturbance or contamination events will be dominated by a limited number of tolerant taxa, which will be represented in high individual abundances (Clarke & Warwick, 2006). There was no evidence of localised super-abundances of pollution tolerant taxon and the numbers of single or low abundance taxa in this survey suggest a reasonably diverse community that has been subject to relatively little disturbance or contamination.

Figure 2.23 Contributions of Gross Taxonomic Groups

a) Individuals




b) Taxa



Species ranking provides additional information on the dominance structure of the faunal community along the ECR and results are presented based on abundance in Table 2.23. Of the top ten ranked adult taxa: four were Annelida, and two each were Arthropoda, Echinodermata, Mollusca and 'Others'.

Results of the species ranking and fidelity scores can give a further indication of a taxon's distribution, with results ≥0.8 and ≤1.2 indicating a generally even distribution of a taxon, whilst values outside of this range represent a patchier distribution. Only two taxa (*Urothoe elegans* and *Echinocyamus pusillus*) within the adult only top ten fell within this range. Additionally, there was some reordering of taxa when ranked by abundance rather than score suggesting the dominant taxa exhibited a patchy distribution. This is consistent with sampling across a relatively wide area covering various sediment types and water depths.

Table 2.23 Species Ranking by Abundance

| Rank | | Taxon | Total Rank Score | Fidelity | Total Abundance | Present at Number of Stations |
|---|---|---|---|---|---|---|
| Score | Abundance | | | | | |
| 1 | 7 | NEMERTEA | 178 | 0.46 | 47 | 25 |
| 2 | 1 | *Amphiura filiformis* | 174 | 0.50 | 74 | 21 |
| 3 | 10 | *Euspira nitida* | 153 | 0.49 | 41 | 22 |
| 4 | 6 | *Peresiella clymenoides* | 149 | 0.55 | 49 | 21 |
| 4 | 9 | *Callianassa subterranea* | 149 | 0.55 | 43 | 20 |
| 5 | 5 | *Papillicardium minimum* | 141 | 0.60 | 53 | 19 |
| 6 | 3 | *Astrorhiza* | 140 | 0.72 | 70 | 17 |
| 7 | 9 | *Urothoe elegans* | 132 | 0.85 | 43 | 18 |
| 8 | 2 | *Echinocyamus pusillus* | 130 | 1.11 | 71 | 17 |
| 9 | 11 | *Galathowenia* | 124 | 1.59 | 38 | 17 |
| 9 | 11 | *Owenia* | 124 | 1.59 | 38 | 19 |
| 10 | 12 | *Scoloplos armiger* | 112 | 2.87 | 34 | 15 |

Cells are coloured according to their taxonomic groups: Annelida, Arthropoda, Echinodermata, Mollusca, 'Others'.

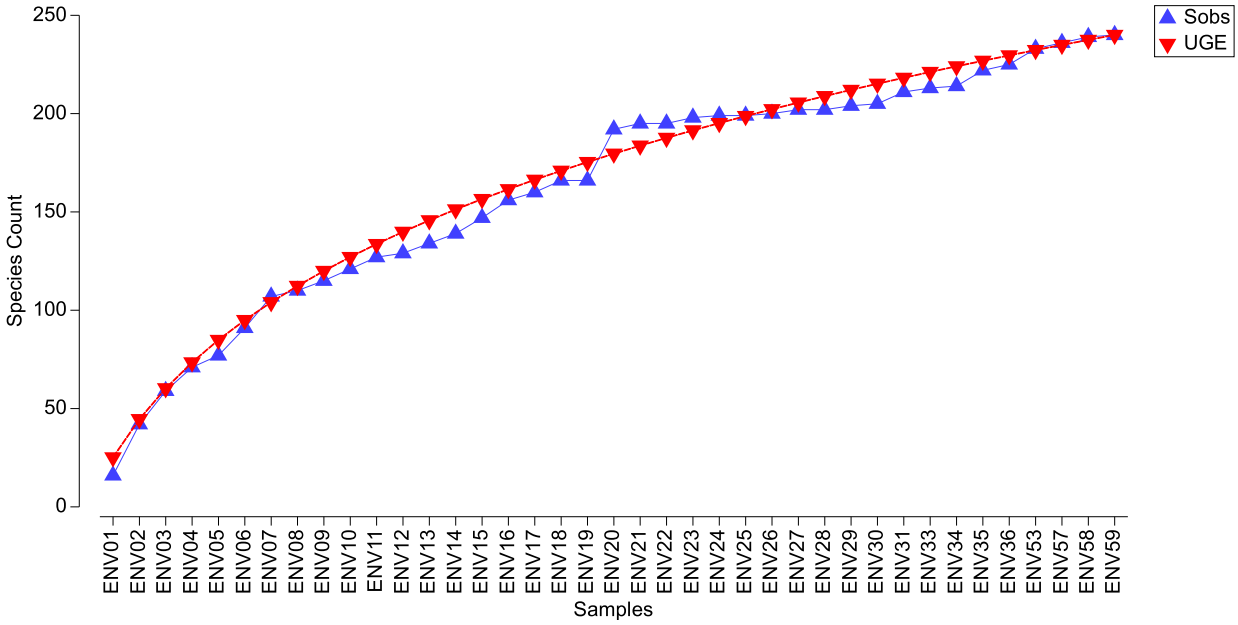
When considering all macrofaunal species observed along the ECR in terms of feeding guilds, the majority of species were identified as suspension feeders (both passive and active), deposit feeders (surface and sub-surface), with examples of predatory and scavenger species. Among the dominant taxa along the ECR there were examples of suspension and deposit feeders.

A species accumulation plot for the adult only abundance data set is presented for the ECR in Figure 2.24Figure 2.26. This plot shows the increasing total number of different taxa observed as samples are pooled. Significant changes in the slope of the Sobs curve compared to the UGE curve can be an indication of differences in the community composition. The Sobs curve began slightly below the UGE curve, but rose relatively with the addition of ENV02, consistent with a shift in faunal community as sampling took place more than 10km from ENV01 in deeper water. Overall, however, the steepest sections of the Sobs curve, bringing it above the UGE curve, occurred when sampling returned to the shallower waters, such as at Station ENV07, ENV20 and ENV53. Most notably, there were 26 taxa added from sampling at Station ENV20, of which 24 were unique to this station.

Station ENV35 was one of the few stations in deeper water where a relatively high number of new taxa were added, all eight of which were unique to this station including four arthropod taxa and the bivalve *Devonia perrieri*.

The UGE curve from the continued to rise with the addition of the last sample, indicating that further samples across the survey area may elicit additional taxa to those reported during the current sampling campaign.

Figure 2.24 Adult Data Set Species Accumulation Curve




### 2.11.4 Biomass Summary Statistics

A total biomass of 270.092g was recorded from the 1891 individuals from 39 samples. Of these, juveniles accounted for 0.14% of the total biomass. Full enumeration of the biomass per sample is tabulated in Appendix N. Biomass was not measured for the five individuals of Anomiidae as these were found attached to rocks and removing them can cause damage, similar to barnacles.

As to be expected, Mollusca (n=131.790g) dominated (see Table 2.24), accounting for 49% of the total biomass largely attributable to two individuals of the bivalve *Venus casina*. The second highest biomass was recorded within Echinodermata (n=116.793g) accounting for 43% of the total biomass and largely attributable to two individuals of the urchin *Brissopsis lyrifera*. Although Arthropoda was the third most abundant group by individuals, it recorded the lowest biomass contribution accounting for 1% of the total biomass.

Table 2.24 Contribution of Gross Taxonomic Groups by Biomass

| Group | Adult Individuals | |
|---|---|---|
| | Total Biomass (g) | Proportional Contribution % |
| Annelida (Polychaeta) | 13.861 | 5 |
| Arthropoda (Malacostraca) | 3.349 | 1 |
| Mollusca | 131.790 | 49 |
| Echinodermata | 116.793 | 43 |
| Others | 4.300 | 2 |
| **Total** | **270.092** | **100** |

Species ranking provides additional information on the dominance structure of the faunal community in the array area and results are presented based on biomass in Table 2.25. When considering species ranking based on biomass, as expected there was some movement in terms of species ranking compared to abundance. Five taxa (*A. filiformis*, *C. subterranea*, *Astrorhiza*, Nemertea and *P. minimum*) remained in the top ten when ranked by biomass with the other taxa being replaced by Mollusca, Annelida and Echinodermata taxa.

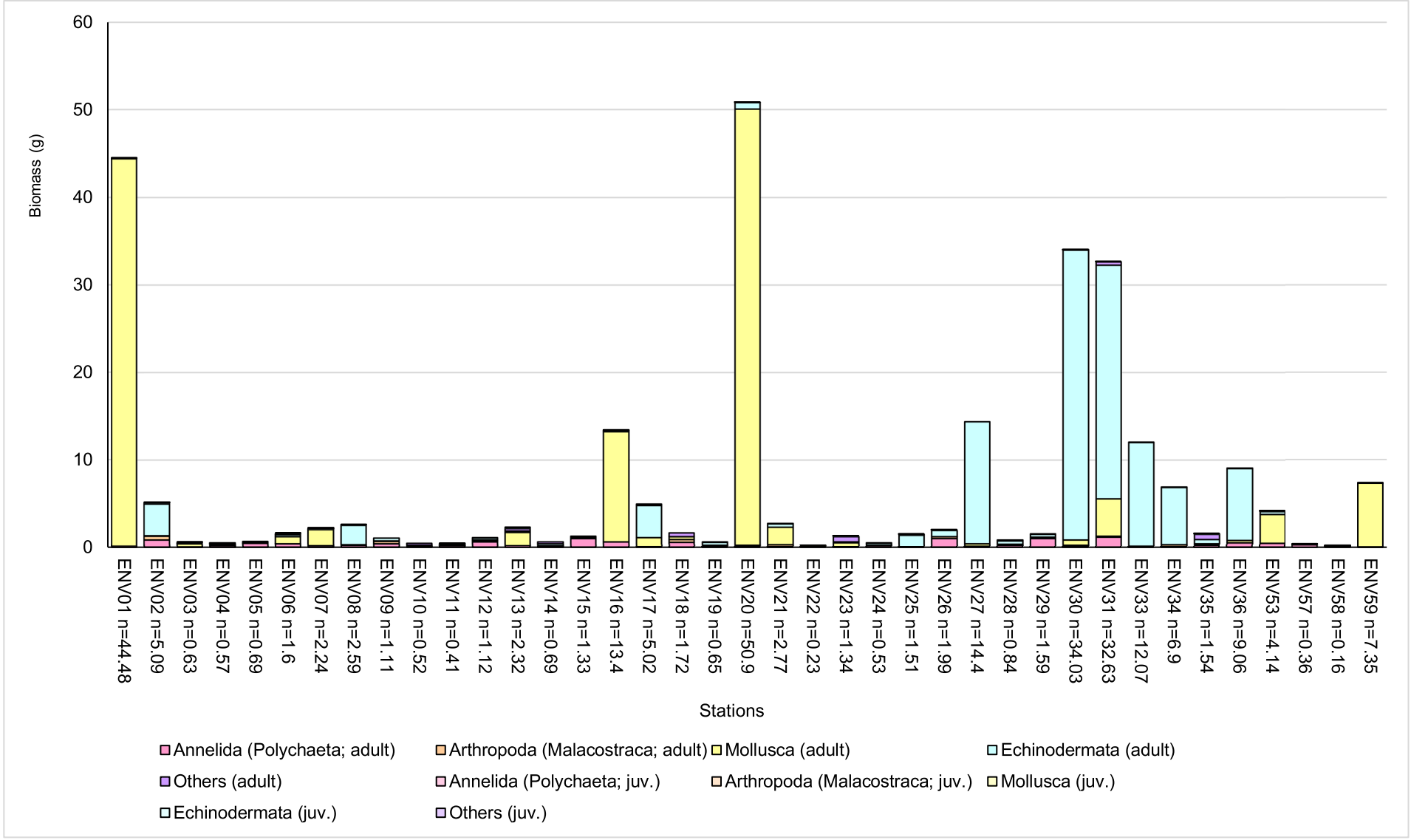
Table 2.25 Species Ranking by Biomass of Adult Only Data

| Rank | | Taxon | Total Rank Score | Fidelity | Total Biomass (g) | Present at Number of Stations |
|---|---|---|---|---|---|---|
| Score | Abundance | | | | | |
| 1 | 7 | *Amphiura filiformis* | 150 | 0.4 | 3.9746 | 21 |
| 2 | 10 | *Callianassa subterranea* | 131 | 0.4 | 2.3937 | 20 |
| 3 | 12 | *Astrorhiza* | 103 | 0.4 | 2.1157 | 17 |
| 4 | 17 | *Leptosynapta bergensis* | 76 | 0.3 | 1.405 | 11 |
| 5 | 1 | *Brissopsis lyrifera* | 70 | 0.3 | 97.4288 | 7 |
| 5 | 23 | NEMERTEA | 70 | 0.3 | 0.7676 | 25 |
| 6 | 9 | *Antalis entalis* | 58 | 0.3 | 2.6384 | 14 |
| 7 | 15 | *Glycera unicornis* | 50 | 0.4 | 1.6354 | 7 |
| 7 | 18 | *Nephtys hombergii* | 50 | 0.4 | 1.3843 | 6 |
| 7 | 35 | *Papillicardium minimum* | 50 | 0.4 | 0.3776 | 19 |
| 8 | 25 | *Rhodine gracilior* | 48 | 0.5 | 0.723 | 9 |
| 9 | 20 | *Amphiura chiajei* | 43 | 0.6 | 1.2124 | 9 |
| 10 | 33 | *Phoronis* | 40 | 1.2 | 0.3835 | 15 |

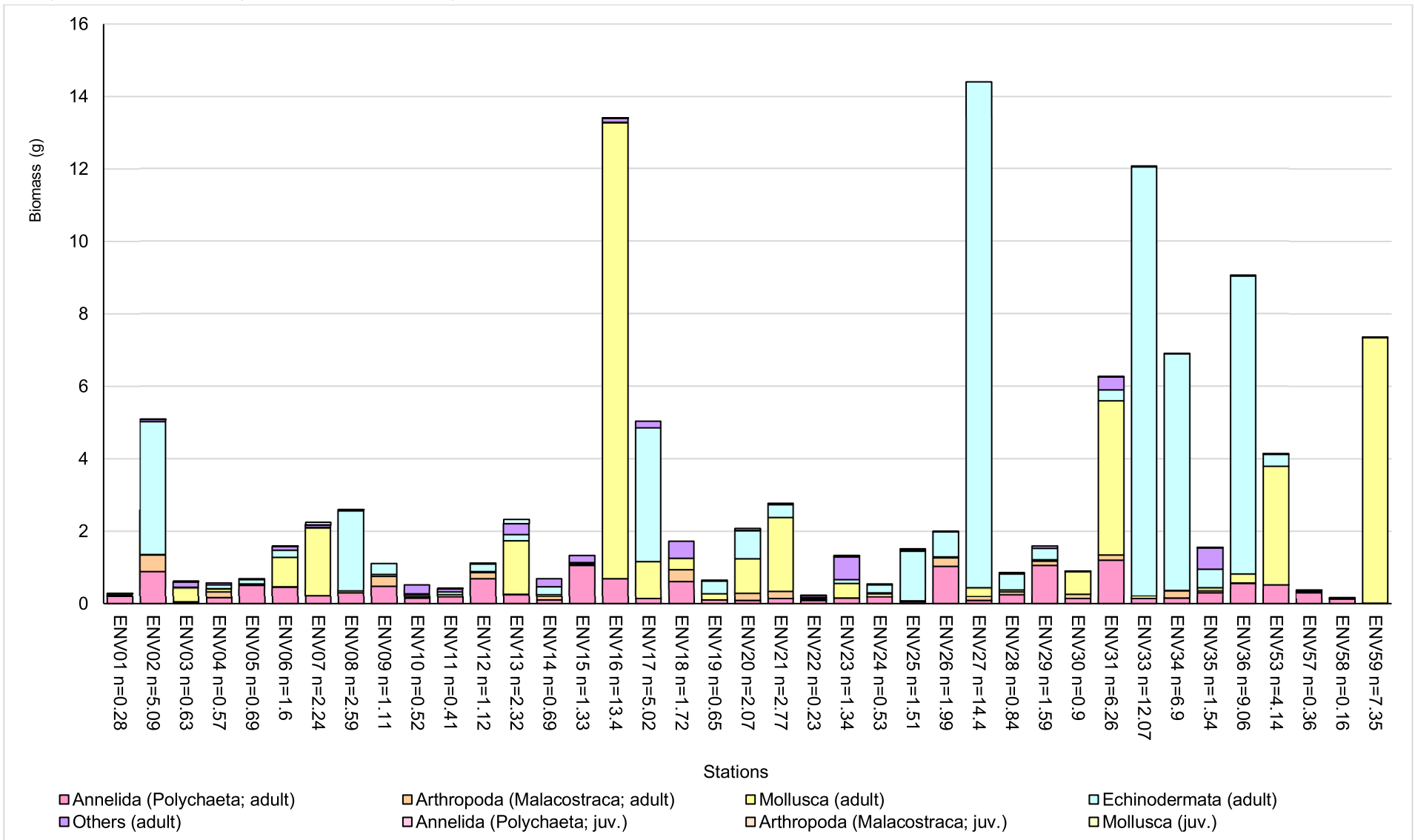
Cells are coloured to indicate taxonomic divisions: Annelida, Arthropoda, Mollusca, Echinodermata, 'Others'.

Figure 2.25 Contributions of Gross Taxonomic Groups by Biomass

a) Biomass – Large Molluscs and Echinoderms Included




b) Biomass – Two Large Molluscs and Two Large Echinoderms Excluded



### 2.11.5 Diversity using Univariate Statistics

The adult abundance data set for the ECR was analysed to provide the total number of individuals and taxa. Shannon-Weiner diversity index (H'), calculated using logarithm base 2 (Shannon & Weaver, 1949), Pielou's eveness (*J*), Simpson's dominance (λ) and Margalef's richness (*d*). Increasing values of the Shannon-Weiner diversity correspond to increasing diversity of the community. Values for the Simpson's dominance index and Pielou's both range from 0 to 1, with 1 indicating a dominated community for the former and an even community for the latter. Margalef's index takes account of the number of species present for a given number of individuals. Detailed information on methods for univariate statistics are presented in Appendix D.10.

The results of the univariate statistics for the adult only macrofaunal data are presented in Table 2.26. Shannon-Weiner diversity values ranged from 2.51 at the shallowest station (ENV57) to 5.29 at Station ENV35 with a mean value of 4.18 (±0.57SD). Margalef's richness followed a similar trend, ranging from 2.23 at Station ENV57 to 10.42 at Station ENV35. Pielou's eveness suggested the community was overall more even than uneven, with values ranging from 0.77 at Station ENV23 to 0.97 at Station ENV11. This was further supported by low Simpson's dominance values which ranged from 0.03 at Station ENV35 to 0.22 at Station ENV57. At the shallowest station (ENV57), the relatively low diversity, dominated community related to the polychaetes *Nepthys cirrosa,* which accounted for 35% (n=8) and *Megalona johnstoni,* which contributed 26% (n=6) of the station's otherwise relatively sparse adult population.

Table 2.26 Faunal Abundance Univariate Statistics

| Sample | n Taxa | nIndividuals | Margalef's Richness (*d*) | Simpson's Dominance (*λ*) | Pielou's Evenness (*J'*) | Shannon Wiener Diversity($H'_{log2}$) |
|---|---|---|---|---|---|---|
| ENV01 | 16 | 39 | 4.09 | 0.17 | 0.82 | 3.29 |
| ENV02 | 31 | 68 | 7.11 | 0.05 | 0.93 | 4.60 |
| ENV03 | 28 | 43 | 7.18 | 0.04 | 0.97 | 4.65 |
| ENV04 | 27 | 63 | 6.28 | 0.06 | 0.92 | 4.36 |
| ENV05 | 28 | 44 | 7.13 | 0.05 | 0.95 | 4.59 |
| ENV06 | 31 | 48 | 7.75 | 0.06 | 0.92 | 4.58 |
| ENV07 | 19 | 40 | 4.88 | 0.11 | 0.88 | 3.73 |
| ENV08 | 22 | 43 | 5.58 | 0.07 | 0.92 | 4.09 |
| ENV09 | 24 | 38 | 6.32 | 0.06 | 0.96 | 4.39 |
| ENV10 | 29 | 60 | 6.84 | 0.11 | 0.85 | 4.12 |
| ENV11 | 19 | 25 | 5.59 | 0.06 | 0.97 | 4.13 |
| ENV12 | 18 | 27 | 5.16 | 0.07 | 0.96 | 4.01 |
| ENV13 | 29 | 70 | 6.59 | 0.09 | 0.85 | 4.14 |
| ENV14 | 23 | 41 | 5.92 | 0.06 | 0.94 | 4.24 |
| ENV15 | 32 | 69 | 7.32 | 0.07 | 0.88 | 4.39 |
| ENV16 | 34 | 81 | 7.51 | 0.05 | 0.92 | 4.68 |
| ENV17 | 21 | 42 | 5.35 | 0.07 | 0.93 | 4.10 |
| ENV18 | 38 | 82 | 8.40 | 0.05 | 0.93 | 4.87 |
| ENV19 | 22 | 38 | 5.77 | 0.11 | 0.88 | 3.91 |
| ENV20 | 39 | 75 | 8.80 | 0.04 | 0.95 | 5.02 |
| ENV21 | 34 | 63 | 7.96 | 0.05 | 0.93 | 4.76 |
| ENV22 | 20 | 27 | 5.76 | 0.06 | 0.96 | 4.16 |
| ENV23 | 16 | 52 | 3.80 | 0.18 | 0.77 | 3.09 |
| ENV24 | 19 | 34 | 5.10 | 0.13 | 0.85 | 3.62 |
| ENV25 | 17 | 30 | 4.70 | 0.08 | 0.93 | 3.82 |
| ENV26 | 20 | 39 | 5.19 | 0.10 | 0.90 | 3.89 |
| ENV27 | 15 | 25 | 4.35 | 0.09 | 0.95 | 3.70 |
| ENV28 | 35 | 62 | 8.24 | 0.06 | 0.91 | 4.66 |
| ENV29 | 26 | 48 | 6.46 | 0.10 | 0.89 | 4.17 |
| ENV30 | 25 | 43 | 6.38 | 0.06 | 0.94 | 4.36 |
| ENV31 | 35 | 68 | 8.06 | 0.04 | 0.94 | 4.81 |
| ENV33 | 23 | 37 | 6.09 | 0.08 | 0.91 | 4.12 |
| ENV34 | 26 | 46 | 6.53 | 0.05 | 0.95 | 4.45 |
| ENV35 | 46 | 75 | 10.42 | 0.03 | 0.96 | 5.29 |
| ENV36 | 30 | 45 | 7.62 | 0.05 | 0.95 | 4.65 |
| ENV53 | 31 | 60 | 7.33 | 0.05 | 0.93 | 4.61 |
| ENV57 | 8 | 23 | 2.23 | 0.22 | 0.84 | 2.51 |
| ENV58 | 16 | 27 | 4.55 | 0.09 | 0.93 | 3.73 |
| ENV59 | 10 | 18 | 3.11 | 0.18 | 0.87 | 2.88 |
| Minimum | 8 | 18 | 2.23 | 0.03 | 0.77 | 2.51 |
| Maximum | 46 | 82 | 10.42 | 0.22 | 0.97 | 5.29 |
| Mean | 25 | 48 | 6.24 | 0.08 | 0.91 | 4.18 |
| ±SD | 8 | 17 | 1.63 | 0.04 | 0.04 | 0.57 |

### 2.11.6 Faunal Community Structure using Multivariate Analyses

In comparison to univariate statistics, multivariate analyses enable subtle trends within the adult data sets to be identified. Multivariate analyses were performed on the rationalised data using PRIMER v7. Bray-Curtis similarity matrices are produced based on the square root transformed abundance data set and fourth root transformed biomass data set. These transformations were chosen to down weight the influence of the numerically dominant species and to ensure that the intermediately abundant and sparse species contribute to the multivariate pattern.

A SIMPROF permutation test was conducted in conjunction with CLUSTER analysis and the results illustrated on a dendrogram (Figure 2.26a). Red lines join samples that are statistically indistinguishable, whilst black lines join samples which are distinct from one another. The Bray Curtis similarity dendrogram and nMDS plot for the adult only abundance data are presented in Figure 2.26.

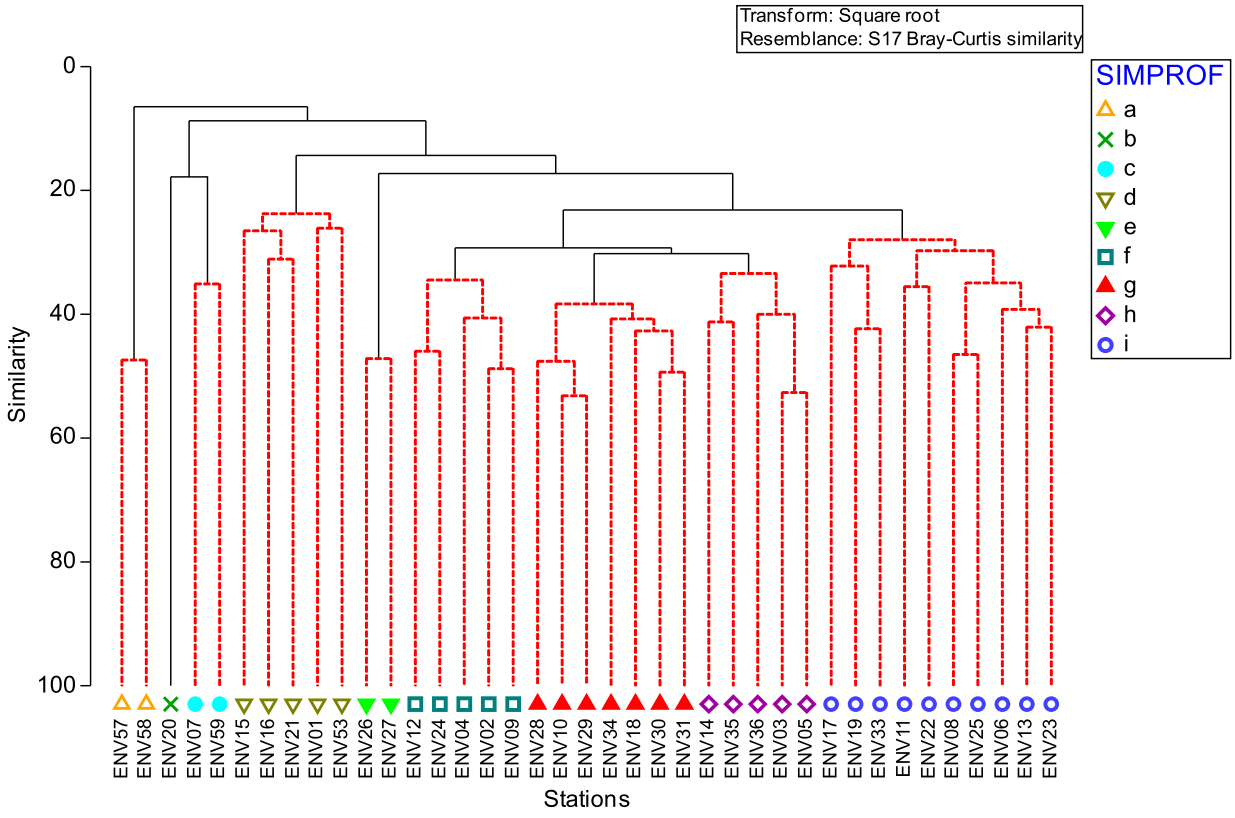
The CLUSTER analysis and dendrogram for the adult abundance station data (Figure 2.26a) identified nine SIMPROF groups which comprised one outlier (Station ENV20, SIMPROF *b*), three closely associated pairs (SIMPROF *a*, *c* and *e*) and five clusters (SIMPROF *d*, *f*, *g*, *h* and *i*). Most stations were more dissimilar than similar to one another, joining together at a Bray-Curtis similarity of 6%.

The nMDS ordination of the adult abundance station data set (Figure 2.26b) revealed a similar pattern to the CLUSTER analysis, with a stress value of 0.19 the ordination can be considered a useful two-dimensional representation of rank dis(similarities) and the overall pattern observed in the data set. With symbols presented according to each station's depth zone, the relationship between faunal community and water depth was apparent.

Examination of the ECR adult abundance data set together with the results of SIMPER analyses, presented in Figure 2.26, highlighted the principal contributors to the grouping and separation of the stations. This was restricted to explaining the separation where similarity was less than 22% for conciseness and includes the principal contributors to the grouping and separation of the stations. Variation in taxa, namely the top ten ranked taxa were responsible for the sample separation.

## Figure 2.26 Multivariate Analysis of Abundance Faunal Data

a) Bray-Curtis Similarity Dendrogram




b) MDS Ordination

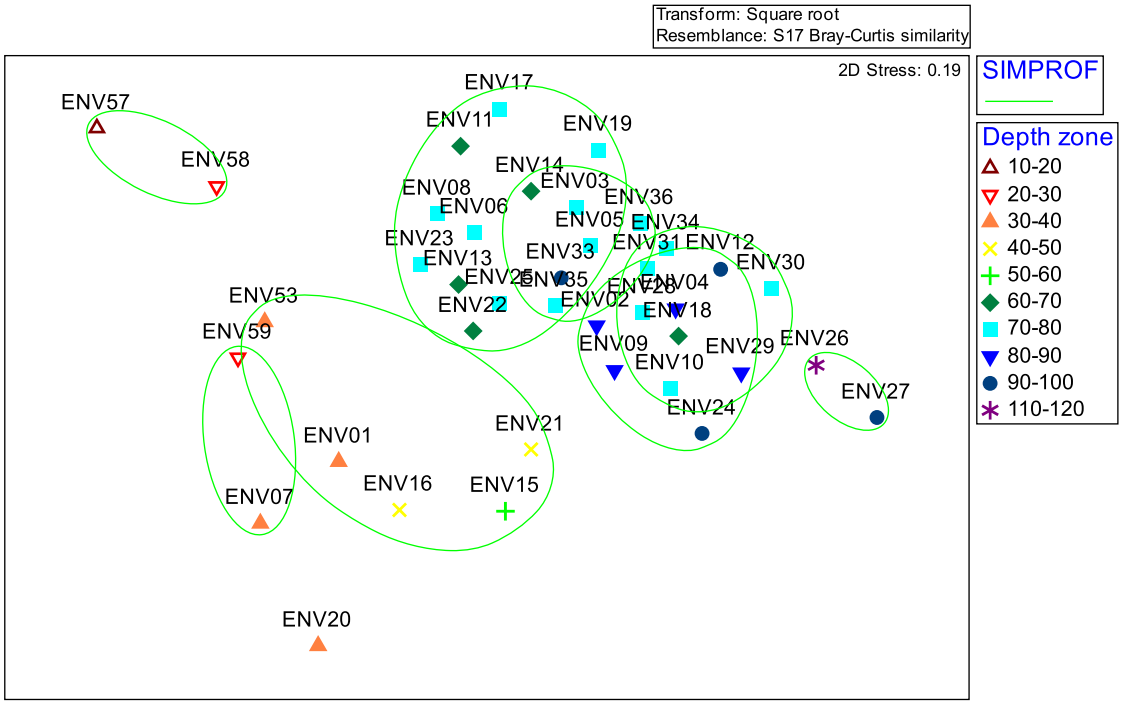


Table 2.27 Taxa influencing Adult Macrofauna Abundance SIMPROF Variation

| Stations | SIMPROF | Similarity (Bray-Curtis %) | Taxa Influencing Station Separation |
|---|---|---|---|
| ENV57 and ENV58 | SIMPROF *a* vs *b-i* | 6.49 | • Higher than remaining stations' average abundance of *N. cirrosa*, *B. guilliamsoniana* and *S. bombyx* (*c.*12% of the dissimilarity).<br>• Presence of *M. johnstoni* and *M. filiformis,* (*c.*7% of the dissimilarity).<br>• Absence of ***A. filiformis***, (*c.*2% of the dissimilarity) |
| ENV20, ENV07 and ENV59 | SIMPROF *b,c* vs *d-i* | 8.76 | • Higher than remaining stations' average abundance of ***E. pusillus***, *Asbjornsenia pygmaea* and *S. armiger* (*c.*8% of the dissimilarity).<br>• Presence of *Urothoe marina*, (*c.*2% of the dissimilarity).<br>• Absence of ***A. filiformis***, ***Astrorhiza***, ***P. clymenoides***, ***P. minimum***, ***C. subterranea*** and *P. cf. dubia*, (*c.*11% of the disimilarity) |
| ENV01, ENV15, ENV16, ENV21 and ENV53 | SIMPROF *d* vs *e-i* | 14.34 | • Higher than remaining stations' average abundance of Thracioidea, ***E. pusillus***, *Edwardsia claparedii*, *S. armiger*, ***U. elegans***, and *Lumbrineris aniara agg.* (*c.*14% of the dissimilarity).<br>• Lower than remaining stations' average abundance of ***A. filiformis***, (*c.*2% of the dissimilarity)<br>• Absence of ***Astrorhiza*** and ***P. minimum*** (*c.*3% of the dissimilarity)<br>• Prescence of *Aponuphis bilineata* (*c.*2% of the dissimilarity) |
| ENV26 and ENV27 | SIMPROF *e* vs *f-i* | 17.27 | • Absence and/or lower than remaining stations' average abundance of *Heteromastus filiformis*, *Eudorella emarginata*, *Nucula sulcata*, *G. unicornis* and *Amphiura chiajei*, (*c.*14% of the dissimilarity).<br>• Higher than remaining stations' average abundance of *P. cf. dubia* (*c.*2% of the dissimilarity).<br>• Presence of ***A. filiformis*** and ***Astrorhiza*** (*c.*5% of the dissimilarity). |
| ENV20 | SIMPROF *b* vs *c* | 17.83 | • Presence of *Scalibregma inflatum*, *Galathea intermedia*, *Amphipholis squamata*, *Tritia* and *Hydroides norvegica*, (*c.*18% of the dissimilarity).<br>• Absence of *A. pygmaea*, (*c.*3% of the dissimilarity). |
| ENV06, ENV08, ENV11, ENV13, ENV17, ENV19, ENV22, ENV23, ENV25 and ENV33 | SIMPROF *i* vs *f-h* | 23.17 | • Lower average abundance of ***Astrorhiza***, *A. entalis*, ***A. filiformis***, ***E. pusillus*** and ***P. minimum***, (*c.*12% of the dissimilarity).<br>• Higher abundance of ***C. subterranea***, *P. cf. dubia*, ***Galathowenia*** and ***P. clymenoides***, (*c.*10% of the dissimilarity). |
| ENV02, ENV04, ENV09, ENV12 and ENV24 | SIMPROF *f* vs *g,h* | 29.27 | • Higher average abundance of *Amphictene auricoma*, ***A. filiformis, P. clymenoides and P. mimimum***, (*c.*11% of the dissimilarity).<br>• Lower abundance of *P. cf. dubia*, ***Astrorhiza,*** *Diplocirrus glaucus and Chaetozone pseudosetosa*, (*c.*10% of the dissimilarity). |
| ENV03, ENV05, ENV14, ENV35 and ENV36 | SIMPROF *h* vs *g* | 30.22 | • Higher abundance of ***Astrorhiza***, ***Euspira nitida***, ***P. minimum***, ***Galathowenia*** and *Phoronis*, (*c.*10% of the dissimilarity).<br>• Lower abundance of *P. cf. dubia*, *Trichobranchus roseus* and *C. pseudosetosa*, (*c.*8% of the dissimilarity).<br>• Absence of *Abra nitida* (*c.*2% of the dissimilarity). |

Taxa in **bold** denotes those within the top ten ranked taxa when assessed by abundance as per Table 2.23

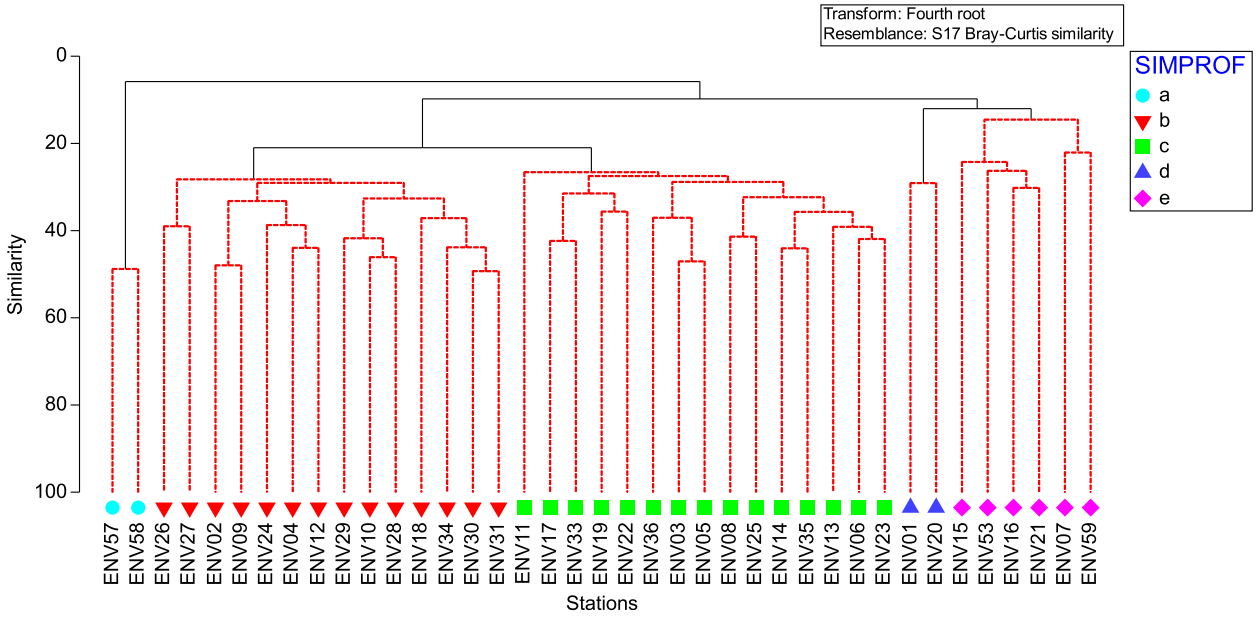
There was some rearranging of the dendrogram when biomass is considered (Figure 2.27a). The adult biomass data set was similarly analysed with CLUSTER analysis and identified five SIMPROF groups comprising two closely associated pairs (SIMPROF *a* and *d*) and three clusters (SIMPROF *b*, *c* and *e*). All stations were more dissimilar than similar to one another, grouping together at 6% Bray-Curtis similarity.

The nMDS ordinations of the ECR adult biomass station data ((Figure 2.27b) revealed a similar pattern to the CLUSTER analysis, with a stress value of 0.19 the ordination can be considered a useful two-dimensional representation of rank dis(similarities) and the overall pattern observed in the data set. With symbols presented according to each station's depth zone, the relationship between faunal community and water depth was again apparent.

Examination of the ECR adult biomass data set together with the results of SIMPER analyses presented in Table 2.28, highlighted the principal contributors to the groupings and separations of the stations.

Figure 2.27 Multivariate Analysis of Biomass Faunal Data

a) Bray-Curtis Similarity Dendrogram



b) MDS Ordination

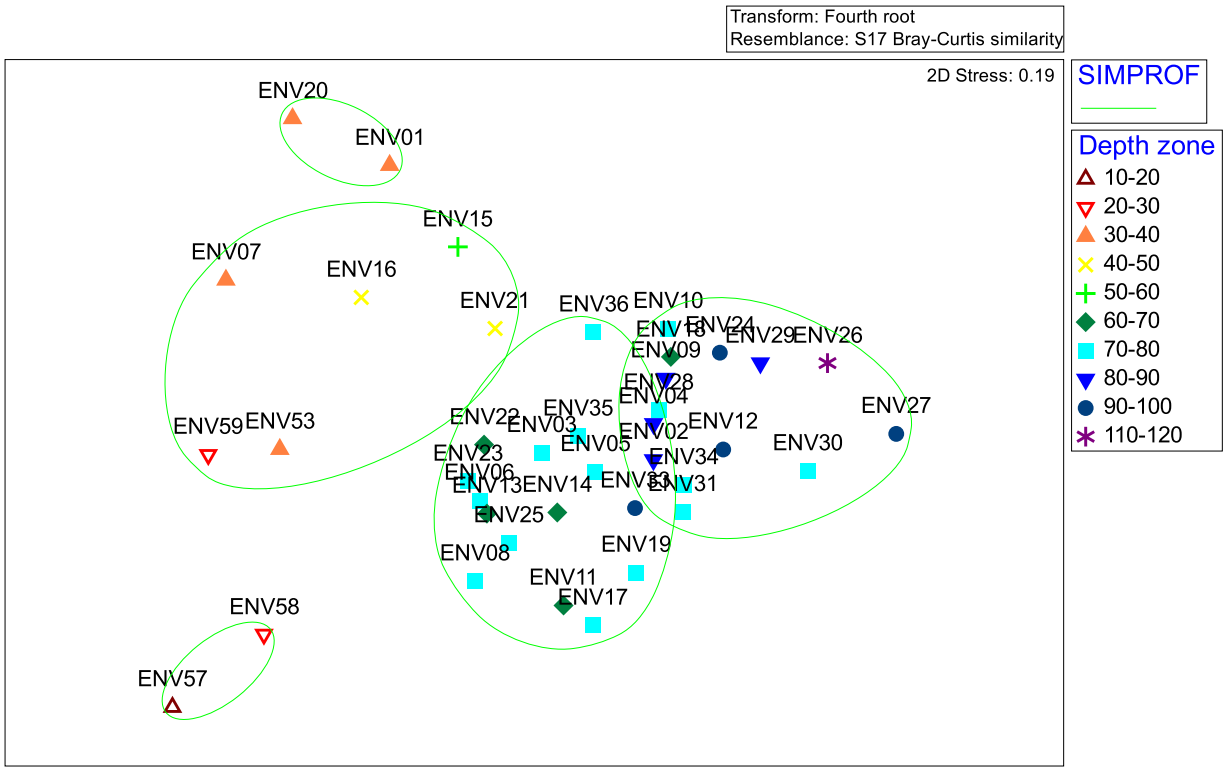



Table 2.28 Taxa Influencing Macrofauna Biomass SIMPROF Variation

| Stations | SIMPROF | Similarity (Bray-Curtis %) | Taxa Influencing Station Separation |
|---|---|---|---|
| ENV57 and ENV58 | SIMPROF *a* vs *b-e* | 5.82 | • Higher than the remaining stations biomass of *N. cirrosa*, *B. guilliamsoniana* and *S. bombyx*, (*c.*11% of the dissimilarity).<br>• Presence of *M. johnstoni*, (*c.*3% of the dissimilarity).<br>• Absence of ***A. filiformis***, ***B. lyrifera*** and ***C. subterranea***, (*c.*8% of the dissimilarity). |
| ENV02 to ENV06, ENV08 to ENV14, ENV17 to ENV19, ENV22 to ENV31 and ENV33 to ENV36 | SIMPROF *b,c* vs *d,e* | 9.79 | • Higher biomass of ***A. filiformis*** and ***C. subterranea***, (*c.*4% of the dissimilarity)<br>• Lower biomass of *Gari fervensis* and **Nemertea**, (*c.*3% of the dissimilarity)<br>• Presence of ***B. lyrifera*** and ***Astrorhiza***, (*c.*4% of the dissimilarity).<br>• Absence of ***Venus casina***, ***Dosinia lupinus***, *Dosinia* and *A. bilineata*, (*c.*9% of the dissimilarity). |
| ENV01 and ENV20 | SIMPROF *d* vs *e* | 12.03 | • Presence of ***V. casina*** and *Amphiura (Ophiopeltis) securigera*, (*c.*18% of the dissimilarity).<br>• Absence of ***G. fervensis***, (*c.*2% of the dissimilarity). |
| ENV02, ENV04, ENV09, ENV10, ENV12, ENV18, ENV24, ENV26 to ENV31 and ENV34 | SIMPROF *b* vs *c* | 20.99 | • Higher biomass of ***B. lyrifera***, ***C. subterranea***, ***L. bergensis*** and ***G. unicornis***, (*c.*13% of the dissimilarity).<br>• Lower biomass of ***A. filiformis***, ***Astrorhiza*** and ***A. entalis***, (*c.*8% of the dissimilarity). |

Taxa in **bold** denotes taxa within the top ten ranked taxa when assessed on biomass.

### 2.11.7 Multivariate Comparison of Faunal and Physico-Chemical Data Sets

The 39 station macrofauna community data set was compared to the corresponding sediment characteristics data set in PRIMER v7 to determine if any patterns in the faunal community correlated with the environmental factors assessed. The BVSTEP analysis identified a 75% correlation between the adult abundance multivariate pattern with fines content.

Similarly, a subset of 9 stations of the macrofauna community adult station data set was compared to the corresponding 9 stations physico-chemical characteristics data set. The BVSTEP analysis identified an 85% correlation between the 9 station adult abundance multivariate pattern with five variables (mean diameter (µm), fines, gravel, TOC and As), indicating it is likely that the faunal community across the ECR varied naturally with physical sediment characteristics. There was no evidence of any anthropogenic impacts associated with chemical variables.

### 2.11.8 Multivariate Comparison of Macrofaunal and Metabarcoding Data Sets

The sediment bacterial and infaunal OTU data sets were compared to the adult macrofaunal abundance and biomass data to determine if there was any correlation. A RELATE analysis identified a significant correlation of 72% ($p<0.01$) for bacterial OTUs and 56% ($p<0.06$) for infaunal OTUs when compared to the adult macrofauna abundance data. Similar results for the bacterial OTUs were found for the biomass indicating a significant correlation of 69% and 55% ($p<0.01$) for infaunal OTUs when compared to the adult biomass data set.

It is important to note that despite significant correlations found, only one macrofauna sample was used for metabarcoding of bacteria and infauna. In order to better utilise this approach for monitoring and avoid missed taxa present in the environment, more replicate DNA samples are needed, in particular replicates associated with each sample (*i.e.* MFA and MFB). Additional sample replication would allow for better comparison between data sets further aiding in a more comprehensive characterisation of the macrofaunal communities across the survey area.

## 2.12 EUNIS Habitat Classification

The European Union Nature Identification System (EUNIS) classification hierarchy to biotope level 5 was mainly based on depth, sediment type and faunal composition. Results of the EUNIS habitat classification based on these data are summarised in Table 2.29 and Appendix O.

All habitats observed in the ECR related to EUNIS level 1 environment ‘Marine benthic habitats’ (EUNIS habitat code M). Three level 2 broad habitats were identified ‘Infralittoral’ (EUNIS habitat type code MB), ‘Circalittoral’ (EUNIS habitat type code MC) and ‘Offshore circalittoral’ (EUNIS habitat type code MD).

The following EUNIS level 3 main habitats were present across the array area:

- Areas of fine sand to muddy sand from below the extreme low water mark to the limit of the photic zone were assigned EUNIS habitat MB5 (Infralittoral sand).
- Areas of mixed sand, gravel and cobbles, generally below 20m, were assigned EUNIS habitat MC4 (circalittoral mixed sediment).
- Areas of fine sand to muddy sand below 20m water depth, were assigned EUNIS habitat MC5 (Atlantic circalittoral sand).
- Areas of mixed sand, gravel and cobbles in depths greater than 30m, were assigned EUNIS habitat MD4 (Offshore circalittoral mixed sediment).
- Areas of fine sand to muddy sand below 60m water depth, were assigned EUNIS habitat MD5 (Offshore circalittoral sand).

- Areas of mud to muddy sand below 60m water depth, were assigned EUNIS habitat MD6 (Offshore circalittoral mud).

EUNIS level 4 main habitat classification was determined considering the habitat descriptions of both the EUNIS website and associated documentation (Davies *et al.*, 2004; EEA, 2019). Along the ECR the following six EUNIS biotope complexes were identified:

- EUNIS Biotope MB523 (Faunal communities of full salinity Atlantic infralittoral sand) which are classified as sands occurring in shallow water on the open coast or in tide-swept channels.
- EUNIS Biotope MC421 (Faunal communities of Atlantic circalittoral mixed sediment) which are classified as mixed sediment habitats in the circalittoral zone (generally below 15-20 m) including well mixed muddy gravelly sands or very poorly sorted mosaics of shell, cobbles and pebbles embedded in or lying upon mud, sand or gravel.
- EUNIS Biotope MC521 (Faunal communities of Atlantic circalittoral sand), classified as sand communities either on the open coast or in tide-swept channels of marine inlets in depths of over 15-20m.
- EUNIS Biotope MD421 (Faunal communities in Atlantic offshore circalittoral mixed sediment) which are classified as deep circalittoral habitats with slightly muddy mixed gravelly sand and stones or shell.
- EUNIS biotope MD521 (Faunal communities in Atlantic offshore circalittoral sand) which are classified as fine sands or non-cohesive muddy sands.
- EUNIS biotope MD621 (Faunal communities on Atlantic offshore circalittoral mud) classified as Sublittoral muds, occurring below moderate depths of 15-20 m, either on the open coast or in marine inlets such as sealochs.

In addition, one level 5 EUNIS biotope complex was identified:

- EUNIS Biotope MB5233 (*N. cirrosa* and *Bathyporeia spp*. in Atlantic infralittoral sand) which is described as well-sorted medium and fine sands characterised by *N. cirrosa* and *Bathyporeia spp*. (and sometimes *Pontocrates spp*.) which occur in the shallow sublittoral to at least 30m depth.

Further, EUNIS biotope MC6216 (Sea pens and burrowing megafauna in Atlantic circalittoral fine mud) was characterised based on a review of the imagery; however, there is a mismatch of visible and infaunal taxa with the sediment type.

Further classification of the macrofaunal community to EUNIS level 5 was attempted with limited success, due to an imperfect fit against the information available on the biotope communities (EEA, 2019; JNCC, 2022b) in addition to the physical mismatch of dominant taxa with sediment type. Due to a lack of consistent structure resulting from a lack of cosmopolitan species across each station it is difficult to suggest a new biotope.

Table 2.29 EUNIS Habitat Classification

| Cluster | Station | Water Depth (m) | EUNIS Folk Classification for PSA Data | EUNIS Level 2 | EUNIS Habitat Classification | | MNCR Habitat Classification | | EUNIS/MNCR Habitat Type | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Level | Code | Level | Code | | |
| *a* | ENV57 | 13 | Sand and muddy sand | MB5 | 5 | MB5233 | 4 | SS.SSa.IFiSa.NcirBat | *Nephtys cirrosa* and *Bathyporeia spp.* in Atlantic infralittoral sand | Fauna is dominated by polychaetes and arthropods in sands and muddy sands in shallow water to at least 30m depth. |
| | ENV58 | 20 | Sand and muddy sand | | | | | | | |
| *b* | ENV20 | 32 | NA | MC4 | 4 | MC421 | 3 | SS.SMx.CMx | Faunal communities of Atlantic circalittoral mixed sediment | Fauna is dominated by epifaunal molluscs in shallow mixed sediment |
| *c* | ENV07 | 32 | Sand and muddy sand | MC5 | 4 | MC521 | 3 | SS.SSa.CMuSa | Faunal communities of Atlantic circalittoral sand | Fauna is dominated by polychaetes, arthropods and bivalves in shallow sand. |
| | ENV59 | 29 | Sand and muddy sand | | | | | | | |
| *d* | ENV01 | 35 | Coarse sediments | MD4 | 4 | MD421 | 3 | SS.SMx.CMx | Faunal communities of Atlantic circalittoral mixed sediment | Fauna is dominated by polychaetes in coarse and mixed sediment. |
| | ENV15 | 52 | Coarse sediments | | | | | | | |
| | ENV16 | 40 | Sand and muddy sand | | | | | | | |
| | ENV21 | 48 | Mixed sediments | | | | | | | |
| | ENV53 | 31 | Sand and muddy sand | | | | | | | |
| *e* | ENV26 | 110 | Mud and sandy mud | MD6<br>MC6 | 4<br>5 | MD621<br>MC6216 | 3<br>4 | SS.SMu.Omu<br>SS.SMu.CFiMu.SpnMeg | Faunal communities on Atlantic offshore circalittoral mud<br>Sea pens and burrowing megafauna in Atlantic circalittoral fine mud | Fauna is dominated by polychaetes and bivalves in sandy mud.<br>Classification including imagery interpretation |
| | ENV27 | 90 | Mud and sandy mud | | | | | | | |
| *f* | ENV02 | 88 | Mud and sandy mud | MD6<br>MC6 | 4<br>5 | MD621<br>MC6216 | 3<br>4 | SS.SMu.Omu<br>SS.SMu.CFiMu.SpnMeg | Faunal communities on Atlantic offshore circalittoral mud<br>Sea pens and burrowing megafauna in Atlantic circalittoral fine mud | Fauna is dominated by polychaetes and bivalves in sandy mud.<br>Classification including imagery interpretation |
| | ENV04 | 83 | Mud and sandy mud | | | | | | | |
| | ENV09 | 87 | Mud and sandy mud | | | | | | | |
| | ENV12 | 90 | Mud and sandy mud | | | | | | | |
| | ENV24 | 92 | Mud and sandy mud | | | | | | | |
| *g* | ENV10 | 78 | Mud and sandy mud | MD6<br>MC6 | 4<br>5 | MD621<br>MC6216 | 3<br>4 | SS.SMu.Omu<br>SS.SMu.CFiMu.SpnMeg | Faunal communities on Atlantic offshore circalittoral mud<br>Sea pens and burrowing megafauna in Atlantic circalittoral fine mud | Fauna is dominated by polychaetes in sandy mud.<br>Classification including imagery interpretation |
| | ENV18 | 69 | Mixed sediments | | | | | | | |
| | ENV28 | 78 | Mud and sandy mud | | | | | | | |
| | ENV29 | 83 | Mud and sandy mud | | | | | | | |
| | ENV30 | 74 | Mud and sandy mud | | | | | | | |
| | ENV31 | 76 | Mud and sandy mud | | | | | | | |
| | ENV34 | 76 | Mud and sandy mud | | | | | | | |
| *h* | ENV03 | 74 | Sand and muddy sand | MD6<br>MC6 | 4<br>5 | MD621<br>MC6216 | 3<br>4 | SS.SMu.Omu<br>SS.SMu.CFiMu.SpnMeg | Faunal communities on Atlantic offshore circalittoral mud<br>Sea pens and burrowing megafauna in Atlantic circalittoral fine mud | Fauna is dominated by polychaetes and arthropods in sandy mud or muddy sand.<br>Classification including imagery interpretation |
| | ENV05 | 75 | Mud and sandy mud | | | | | | | |
| | ENV14 | 69 | Sand and muddy sand | | | | | | | |
| | ENV35 | 78 | Mud and sandy mud | | | | | | | |
| | ENV36 | 73 | Sand and muddy sand | | | | | | | |
| *i* | ENV06 | 71 | Sand and muddy sand | MD5<br>MC6 | 4<br>5 | MD521<br>MC6216 | 3<br>4 | SS.SSa.CMuSa<br>SS.SMu.CFiMu.SpnMeg | Faunal communities of Atlantic offshore circalittoral sand<br>Sea pens and burrowing megafauna in Atlantic circalittoral fine mud | Fauna is dominated by molluscs and echinoderms in sand and muddy sand.<br>Classification including imagery interpretation |
| | ENV08 | 73 | Sand and muddy sand | | | | | | | |
| | ENV11 | 68 | Mud and sandy mud | | | | | | | |
| | ENV13 | 63 | Sand and muddy sand | | | | | | | |
| | ENV17 | 75 | Sand and muddy sand | | | | | | | |
| | ENV19 | 79 | Sand and muddy sand | | | | | | | |
| | ENV22 | 64 | Sand and muddy sand | | | | | | | |
| | ENV23 | 74 | Sand and muddy sand | | | | | | | |
| | ENV25 | 75 | Sand and muddy sand | | | | | | | |
| | ENV33 | 92 | Sand and muddy sand | | | | | | | |

# 3 CONCLUSION

Water profiles along the ECR displayed mixed surface waters overlying a more stable water column structure below 20m depth, with the nearshore profile exhibiting a well-mixed profile throughout. The salinity profiles reflected the freshwater inputs in the surface layers with the exception of the nearshore Station ENV53 which had a stable salinity throughout consistent with a well-mixed water column. The dissolved oxygen maximum within the top 10m of the water column was consistent with the air-sea interface providing a gas exchange, with a decrease in dissolved oxygen through the water column consistent with respiration by organisms and bacterial digestion of sinking organic matter. The turbidity and pH profiles were relatively consistent through the water column with the nearshore Station ENV53 showing slightly higher turbidity, potentially attributable to the spring phytoplankton bloom.

Sediment samples along the ECR were dominated by the sand fraction. Sediments were described as very poorly to moderately well sorted sand gravel to muddy sand (Folk, 1954). Concentrations of TOC were positively correlated with the percentage of fines and depth.

Hydrocarbon concentrations along the ECR were below the published thresholds indicating the faunal community was not expected to be significantly influenced by THC concentrations.

The concentrations of UCM suggested that the hydrocarbons were well weathered with some fresher inputs and typical of background levels. Further investigation of the CPI values and Pr:Ph ratio indicated a prevalence of biogenic inputs, with a degree of petrogenic input evident by the presence of Ph at some stations. In addition, total PAH concentrations were below their respective ERL.

Concentrations of PCB and organotins were below the limit of detection at all stations, while PBDE 209 concentration exceeded the OSPAR (2020) BAC after normalisation to 2.5% TOC at all but Station ENV58 where it was below the limit of detection. However, these values were below the FEQG values (Viñas *et al.*, 2023). Concentrations of OCP where either below the limit of detection, or below CAL1 concentrations.

Metal concentrations were below ERL suggesting toxic effects on the faunal community due to metal concentrations were unlikely to occur.

A total of 443 bacterial sediment OTUs were recorded along the ECR, while 48 infaunal sediment OTUs were identified. Of these, the most abundant bacterial OTUs were within the ‘Others’ category when classified by class, while the most abundant infaunal OTUs were within the Polychaeta class. The water eDNA analysis recorded 30 fish OTUs and 42 vertebrate OTUs. The most detected OTUs were within the Gadidae and Pleuronectidae taxonomic groups when classified by family, for both the fish and vertebrate water eDNA datasets.

When considering the ECR in terms of abundance, the macrofaunal community was characterised by Annelida followed by Mollusca. However, when considering the faunal community in terms of biomass, Mollusca was the most dominant group followed by Echinodermata, which is to be expected given the size difference of this group compared to polychaetes.

EUNIS classification based on the macrofaunal community was attempted with limited success due to an imperfect fit against information available on the biotope communities. Additionally, there was a physical mismatch of the dominant taxa with the sediment type identified within PSA data. Due to the lack of consistent structure resulting from a lack of cosmopolitan species across the stations a new biotope was not able to be suggested.

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# APPENDICES

# APPENDIX A SCOPE OF WORK

Appendix A is confidential and has been withdrawn from this report.

# APPENDIX B FIELD SAMPLING LOGS

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 19-Mar-2023 | 13:39:30 | 1 | ECR_ENV_39 | | | camera | 40 | 523607 | 6396245 | 523566 | 6396273 | 41 | -28 | 50 | -55 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:39:49 | 2 | ECR_ENV_39 | | | camera | 40 | 523605 | 6396248 | 523566 | 6396273 | 39 | -25 | 46 | -57 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:40:08 | 3 | ECR_ENV_39 | | | camera | 39 | 523608 | 6396246 | 523566 | 6396273 | 42 | -27 | 50 | -57 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:40:27 | 4 | ECR_ENV_39 | | | camera | 40 | 523611 | 6396245 | 523566 | 6396273 | 45 | -28 | 53 | -58 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:40:39 | 5 | ECR_ENV_39 | | | camera | 40 | 523614 | 6396244 | 523566 | 6396273 | 48 | -29 | 56 | -58 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:40:46 | 6 | ECR_ENV_39 | | | camera | 39 | 523615 | 6396243 | 523566 | 6396273 | 49 | -30 | 58 | -58 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:42:08 | 7 | ECR_ENV_39 | | | camera | 39 | 523608 | 6396243 | 523566 | 6396273 | 42 | -30 | 52 | -54 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:42:26 | 8 | ECR_ENV_39 | | | camera | 39 | 523609 | 6396246 | 523566 | 6396273 | 43 | -27 | 51 | -57 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:42:43 | 9 | ECR_ENV_39 | | | camera | 39 | 523610 | 6396248 | 523566 | 6396273 | 44 | -25 | 51 | -60 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:43:16 | 10 | ECR_ENV_39 | | | camera | 39 | 523606 | 6396250 | 523566 | 6396273 | 40 | -23 | 46 | -60 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:43:28 | 11 | ECR_ENV_39 | | | camera | 39 | 523606 | 6396251 | 523566 | 6396273 | 40 | -22 | 46 | -61 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:44:06 | 12 | ECR_ENV_39 | | | camera | 39 | 523602 | 6396253 | 523566 | 6396273 | 36 | -20 | 41 | -60 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:44:16 | 13 | ECR_ENV_39 | | | camera | 39 | 523602 | 6396254 | 523566 | 6396273 | 36 | -19 | 41 | -62 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:44:37 | 14 | ECR_ENV_39 | | | camera | 39 | 523601 | 6396255 | 523566 | 6396273 | 35 | -18 | 39 | -62 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:44:49 | 15 | ECR_ENV_39 | | | camera | 39 | 523600 | 6396256 | 523566 | 6396273 | 34 | -17 | 38 | -63 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:45:19 | 16 | ECR_ENV_39 | | | camera | 40 | 523600 | 6396260 | 523566 | 6396273 | 34 | -13 | 36 | -68 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:46:20 | 17 | ECR_ENV_39 | | | camera | 40 | 523598 | 6396266 | 523566 | 6396273 | 32 | -7 | 33 | -77 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:46:33 | 18 | ECR_ENV_39 | | | camera | 40 | 523597 | 6396266 | 523566 | 6396273 | 31 | -7 | 32 | -76 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:46:46 | 19 | ECR_ENV_39 | | | camera | 40 | 523595 | 6396267 | 523566 | 6396273 | 29 | -6 | 30 | -77 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:47:19 | 20 | ECR_ENV_39 | | | camera | 40 | 523592 | 6396267 | 523566 | 6396273 | 26 | -6 | 27 | -76 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:48:08 | 21 | ECR_ENV_39 | | | camera | 40 | 523588 | 6396272 | 523566 | 6396273 | 22 | -1 | 22 | -86 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:48:32 | 22 | ECR_ENV_39 | | | camera | 40 | 523587 | 6396274 | 523566 | 6396273 | 21 | 1 | 21 | -92 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:48:54 | 23 | ECR_ENV_39 | | | camera | 40 | 523584 | 6396276 | 523566 | 6396273 | 18 | 3 | 18 | -98 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:49:07 | 24 | ECR_ENV_39 | | | camera | 40 | 523583 | 6396276 | 523566 | 6396273 | 17 | 3 | 17 | -99 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:49:17 | 25 | ECR_ENV_39 | | | camera | 40 | 523582 | 6396276 | 523566 | 6396273 | 16 | 3 | 16 | -99 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:49:45 | 26 | ECR_ENV_39 | | | camera | 40 | 523579 | 6396277 | 523566 | 6396273 | 13 | 4 | 13 | -106 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:50:33 | 27 | ECR_ENV_39 | | | camera | 40 | 523574 | 6396277 | 523566 | 6396273 | 8 | 4 | 9 | -114 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:50:51 | 28 | ECR_ENV_39 | | | camera | 40 | 523571 | 6396277 | 523566 | 6396273 | 5 | 4 | 6 | -126 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:52:19 | 29 | ECR_ENV_39 | | | camera | 40 | 523564 | 6396280 | 523566 | 6396273 | -2 | 7 | 7 | 162 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:52:46 | 30 | ECR_ENV_39 | | | camera | 40 | 523561 | 6396283 | 523566 | 6396273 | -5 | 10 | 11 | 152 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:53:03 | 31 | ECR_ENV_39 | | | camera | 40 | 523560 | 6396284 | 523566 | 6396273 | -6 | 11 | 12 | 150 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:53:21 | 32 | ECR_ENV_39 | | | camera | 40 | 523559 | 6396285 | 523566 | 6396273 | -7 | 12 | 14 | 148 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:53:43 | 33 | ECR_ENV_39 | | | camera | 40 | 523557 | 6396286 | 523566 | 6396273 | -9 | 13 | 16 | 144 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:54:07 | 34 | ECR_ENV_39 | | | camera | 40 | 523556 | 6396288 | 523566 | 6396273 | -10 | 15 | 18 | 145 | DM | (Raw Nav, C-Tecnics 3022) (V) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | | Vertical / Tidal Datum | VORF, LAT | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 19-Mar-2023 | 13:54:26 | 35 | ECR_ENV_39 | | | camera | 40 | 523554 | 6396289 | 523566 | 6396273 | -12 | 16 | 20 | 142 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:55:26 | 36 | ECR_ENV_39 | | | camera | 40 | 523550 | 6396296 | 523566 | 6396273 | -16 | 23 | 28 | 144 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:55:41 | 37 | ECR_ENV_39 | | | camera | 40 | 523549 | 6396298 | 523566 | 6396273 | -17 | 25 | 30 | 145 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:56:06 | 38 | ECR_ENV_39 | | | camera | 40 | 523549 | 6396301 | 523566 | 6396273 | -17 | 28 | 32 | 148 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:56:23 | 39 | ECR_ENV_39 | | | camera | 40 | 523550 | 6396302 | 523566 | 6396273 | -16 | 29 | 33 | 151 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:56:49 | 40 | ECR_ENV_39 | | | camera | 40 | 523550 | 6396304 | 523566 | 6396273 | -16 | 31 | 35 | 152 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:57:03 | 41 | ECR_ENV_39 | | | camera | 40 | 523549 | 6396307 | 523566 | 6396273 | -17 | 34 | 38 | 153 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:57:43 | 42 | ECR_ENV_39 | | | camera | 40 | 523549 | 6396312 | 523566 | 6396273 | -17 | 39 | 42 | 156 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:58:02 | 43 | ECR_ENV_39 | | | camera | 40 | 523550 | 6396315 | 523566 | 6396273 | -16 | 42 | 45 | 159 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:58:16 | 44 | ECR_ENV_39 | | | camera | 40 | 523549 | 6396317 | 523566 | 6396273 | -17 | 44 | 47 | 159 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:58:34 | 45 | ECR_ENV_39 | | | camera | 40 | 523550 | 6396320 | 523566 | 6396273 | -16 | 47 | 49 | 161 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 13:58:46 | 46 | ECR_ENV_39 | | | camera | 40 | 523550 | 6396320 | 523566 | 6396273 | -16 | 47 | 49 | 161 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:09:06 | 47 | ECR_ENV_38 | | | camera | 60 | 523698 | 6398966 | 523646 | 6398992 | 53 | -26 | 59 | -64 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:09:36 | 48 | ECR_ENV_38 | | | camera | 60 | 523696 | 6398970 | 523646 | 6398992 | 51 | -22 | 55 | -67 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:09:48 | 49 | ECR_ENV_38 | | | camera | 60 | 523696 | 6398971 | 523646 | 6398992 | 51 | -21 | 55 | -68 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:10:02 | 50 | ECR_ENV_38 | | | camera | 60 | 523695 | 6398973 | 523646 | 6398992 | 50 | -19 | 53 | -69 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:10:21 | 51 | ECR_ENV_38 | | | camera | 60 | 523694 | 6398976 | 523646 | 6398992 | 49 | -16 | 51 | -72 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:10:42 | 52 | ECR_ENV_38 | | | camera | 60 | 523692 | 6398975 | 523646 | 6398992 | 47 | -17 | 49 | -70 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:10:51 | 53 | ECR_ENV_38 | | | camera | 60 | 523691 | 6398975 | 523646 | 6398992 | 46 | -17 | 49 | -70 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:11:09 | 54 | ECR_ENV_38 | | | camera | 60 | 523688 | 6398976 | 523646 | 6398992 | 43 | -16 | 45 | -70 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:11:24 | 55 | ECR_ENV_38 | | | camera | 60 | 523687 | 6398976 | 523646 | 6398992 | 42 | -16 | 44 | -69 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:11:35 | 56 | ECR_ENV_38 | | | camera | 60 | 523686 | 6398976 | 523646 | 6398992 | 41 | -16 | 43 | -69 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:11:52 | 57 | ECR_ENV_38 | | | camera | 60 | 523686 | 6398978 | 523646 | 6398992 | 41 | -14 | 43 | -71 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:12:16 | 58 | ECR_ENV_38 | | | camera | 60 | 523685 | 6398983 | 523646 | 6398992 | 40 | -9 | 40 | -77 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:12:30 | 59 | ECR_ENV_38 | | | camera | 60 | 523685 | 6398985 | 523646 | 6398992 | 40 | -7 | 40 | -80 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:12:48 | 60 | ECR_ENV_38 | | | camera | 60 | 523684 | 6398986 | 523646 | 6398992 | 39 | -6 | 39 | -81 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:13:18 | 61 | ECR_ENV_38 | | | camera | 60 | 523678 | 6398986 | 523646 | 6398992 | 33 | -6 | 33 | -80 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:13:33 | 62 | ECR_ENV_38 | | | camera | 60 | 523676 | 6398987 | 523646 | 6398992 | 31 | -5 | 31 | -81 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:14:04 | 63 | ECR_ENV_38 | | | camera | 60 | 523673 | 6398988 | 523646 | 6398992 | 28 | -4 | 28 | -82 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:14:18 | 64 | ECR_ENV_38 | | | camera | 60 | 523672 | 6398989 | 523646 | 6398992 | 27 | -3 | 27 | -84 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:14:32 | 65 | ECR_ENV_38 | | | camera | 60 | 523670 | 6398991 | 523646 | 6398992 | 25 | -1 | 24 | -88 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:14:40 | 66 | ECR_ENV_38 | | | camera | 60 | 523670 | 6398991 | 523646 | 6398992 | 25 | -1 | 24 | -88 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:14:52 | 67 | ECR_ENV_38 | | | camera | 60 | 523669 | 6398991 | 523646 | 6398992 | 24 | -1 | 23 | -88 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:15:09 | 68 | ECR_ENV_38 | | | camera | 60 | 523666 | 6398992 | 523646 | 6398992 | 21 | 0 | 20 | -90 | DM | (Raw Nav, C-Tecnics 3022) (V) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | | Vessel | MV *Ocean Endeavour* | | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | | Vessel Reference Point (VRP) | COG | | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 | |
| Primary Positioning System | Starpack 1 | | | | Actual Coordinates derived from | Vessel | | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | | Projection | UTM zone 30N | | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 19-Mar-2023 | 15:15:24 | 69 | ECR_ENV_38 | | | camera | 60 | 523665 | 6398993 | 523646 | 6398992 | 20 | 1 | 20 | -93 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:15:38 | 70 | ECR_ENV_38 | | | camera | 60 | 523663 | 6398993 | 523646 | 6398992 | 18 | 1 | 18 | -94 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:16:04 | 71 | ECR_ENV_38 | | | camera | 60 | 523659 | 6398995 | 523646 | 6398992 | 14 | 3 | 14 | -103 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:16:15 | 72 | ECR_ENV_38 | | | camera | 60 | 523658 | 6398995 | 523646 | 6398992 | 13 | 3 | 13 | -104 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:16:35 | 73 | ECR_ENV_38 | | | camera | 60 | 523657 | 6398998 | 523646 | 6398992 | 12 | 6 | 13 | -118 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:17:09 | 74 | ECR_ENV_38 | | | camera | 60 | 523655 | 6399001 | 523646 | 6398992 | 9 | 9 | 13 | -134 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:17:39 | 75 | ECR_ENV_38 | | | camera | 60 | 523651 | 6399003 | 523646 | 6398992 | 5 | 11 | 12 | -154 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:17:54 | 76 | ECR_ENV_38 | | | camera | 60 | 523650 | 6399003 | 523646 | 6398992 | 4 | 11 | 12 | -158 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:18:15 | 77 | ECR_ENV_38 | | | camera | 60 | 523647 | 6399004 | 523646 | 6398992 | 1 | 12 | 12 | -173 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:18:23 | 78 | ECR_ENV_38 | | | camera | 60 | 523645 | 6399004 | 523646 | 6398992 | -1 | 12 | 12 | 178 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:18:32 | 79 | ECR_ENV_38 | | | camera | 60 | 523644 | 6399005 | 523646 | 6398992 | -2 | 13 | 13 | 173 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:19:05 | 80 | ECR_ENV_38 | | | camera | 60 | 523641 | 6399009 | 523646 | 6398992 | -5 | 17 | 18 | 165 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:19:32 | 81 | ECR_ENV_38 | | | camera | 60 | 523639 | 6399013 | 523646 | 6398992 | -7 | 21 | 22 | 163 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:19:47 | 82 | ECR_ENV_38 | | | camera | 60 | 523638 | 6399014 | 523646 | 6398992 | -8 | 22 | 23 | 161 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:20:03 | 83 | ECR_ENV_38 | | | camera | 60 | 523636 | 6399016 | 523646 | 6398992 | -10 | 24 | 26 | 158 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:20:25 | 84 | ECR_ENV_38 | | | camera | 60 | 523633 | 6399017 | 523646 | 6398992 | -13 | 25 | 28 | 154 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:20:38 | 85 | ECR_ENV_38 | | | camera | 60 | 523632 | 6399018 | 523646 | 6398992 | -14 | 26 | 29 | 153 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:20:58 | 86 | ECR_ENV_38 | | | camera | 60 | 523630 | 6399020 | 523646 | 6398992 | -16 | 28 | 32 | 151 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:21:22 | 87 | ECR_ENV_38 | | | camera | 60 | 523628 | 6399022 | 523646 | 6398992 | -18 | 30 | 35 | 150 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:21:41 | 88 | ECR_ENV_38 | | | camera | 60 | 523626 | 6399024 | 523646 | 6398992 | -20 | 32 | 38 | 149 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:21:53 | 89 | ECR_ENV_38 | | | camera | 60 | 523625 | 6399025 | 523646 | 6398992 | -21 | 33 | 39 | 148 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:22:06 | 90 | ECR_ENV_38 | | | camera | 60 | 523623 | 6399026 | 523646 | 6398992 | -23 | 34 | 41 | 147 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:22:27 | 91 | ECR_ENV_38 | | | camera | 60 | 523621 | 6399028 | 523646 | 6398992 | -25 | 36 | 44 | 146 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 15:22:36 | 92 | ECR_ENV_38 | | | camera | 60 | 523620 | 6399028 | 523646 | 6398992 | -26 | 36 | 44 | 145 | DM | (Raw Nav, C-Tecnics 3022) (V) |
| 19-Mar-2023 | 16:22:15 | 93 | ECR_ENV_37 | | | camera | 75 | 526654 | 6399251 | 526607 | 6399300 | 47 | -49 | 68 | -44 | DM | (Corr'd Nav, Kongsberg 14208, img#1) (V) (T.A) |
| 19-Mar-2023 | 16:22:30 | 94 | ECR_ENV_37 | | | camera | 76 | 526654 | 6399253 | 526607 | 6399300 | 47 | -47 | 67 | -45 | DM | (Corr'd Nav, Kongsberg 14208, img#2) (V) (T.A) |
| 19-Mar-2023 | 16:22:54 | 95 | ECR_ENV_37 | | | camera | 76 | 526653 | 6399257 | 526607 | 6399300 | 46 | -44 | 63 | -46 | | (Corr'd Nav, Kongsberg 14208, img#3) (V) (T.A) # No photo taken |
| 19-Mar-2023 | 16:23:05 | 96 | ECR_ENV_37 | | | camera | 76 | 526651 | 6399258 | 526607 | 6399300 | 44 | -43 | 61 | -46 | | (Corr'd Nav, Kongsberg 14208, img#4) (V) (T.A) |
| 19-Mar-2023 | 16:23:16 | 97 | ECR_ENV_37 | | | camera | 76 | 526650 | 6399258 | 526607 | 6399300 | 43 | -42 | 60 | -45 | | (Corr'd Nav, Kongsberg 14208, img#5) (V) (T.A) |
| 19-Mar-2023 | 16:23:39 | 98 | ECR_ENV_37 | | | camera | 75 | 526647 | 6399261 | 526607 | 6399300 | 40 | -39 | 56 | -46 | | (Corr'd Nav, Kongsberg 14208, img#6) (V) (T.A) |
| 19-Mar-2023 | 16:24:00 | 99 | ECR_ENV_37 | | | camera | 75 | 526645 | 6399262 | 526607 | 6399300 | 37 | -38 | 53 | -44 | | (Corr'd Nav, Kongsberg 14208, img#7) (V) (T.A) |
| 19-Mar-2023 | 16:24:50 | 100 | ECR_ENV_37 | | | camera | 75.5 | 526638 | 6399268 | 526607 | 6399300 | 31 | -32 | 44 | -44 | | (Corr'd Nav, Kongsberg 14208, img#8) (V) (T.A) # No photo taken |
| 19-Mar-2023 | 16:24:59 | 101 | ECR_ENV_37 | | | camera | 75.6 | 526637 | 6399269 | 526607 | 6399300 | 30 | -31 | 43 | -44 | | (Corr'd Nav, Kongsberg 14208, img#9) (V) (T.A) # No photo taken |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | | | Vessel | MV *Ocean Endeavour* | | | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | | | Vessel Reference Point (VRP) | COG | | | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | | | Deployment Location | Camera Deployment Node | | x | 6.7 | y | 21.94 | z | 2.93 | |
| Primary Positioning System | Starpack 1 | | | | | Actual Coordinates derived from | Vessel | | | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | | Ellipsoid | WGS 84 | | Projection | UTM zone 30N | | | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 19-Mar-2023 | 16:25:09 | 102 | ECR_ENV_37 | | | camera | 76 | 526636 | 6399270 | 526607 | 6399300 | 29 | -30 | 42 | -44 | DM | (Corr'd Nav, Kongsberg 14208, img#10) (V) (T.A) |
| 19-Mar-2023 | 16:25:29 | 103 | ECR_ENV_37 | | | camera | 75 | 526634 | 6399272 | 526607 | 6399300 | 27 | -28 | 39 | -44 | DM | (Corr'd Nav, Kongsberg 14208, img#11) (V) (T.A) |
| 19-Mar-2023 | 16:25:46 | 104 | ECR_ENV_37 | | | camera | 75 | 526633 | 6399274 | 526607 | 6399300 | 25 | -27 | 37 | -44 | DM | (Corr'd Nav, Kongsberg 14208, img#12) (V) (T.A) |
| 19-Mar-2023 | 16:26:05 | 105 | ECR_ENV_37 | | | camera | 75 | 526631 | 6399275 | 526607 | 6399300 | 24 | -25 | 34 | -43 | DM | (Corr'd Nav, Kongsberg 14208, img#13) (V) (T.A) |
| 19-Mar-2023 | 16:26:25 | 106 | ECR_ENV_37 | | | camera | 75 | 526629 | 6399278 | 526607 | 6399300 | 21 | -23 | 31 | -43 | DM | (Corr'd Nav, Kongsberg 14208, img#14) (V) (T.A) |
| 19-Mar-2023 | 16:26:44 | 107 | ECR_ENV_37 | | | camera | 75 | 526628 | 6399279 | 526607 | 6399300 | 20 | -21 | 29 | -44 | DM | (Corr'd Nav, Kongsberg 14208, img#15) (V) (T.A) |
| 19-Mar-2023 | 16:27:03 | 108 | ECR_ENV_37 | | | camera | 75 | 526628 | 6399282 | 526607 | 6399300 | 20 | -19 | 28 | -47 | | (Corr'd Nav, Kongsberg 14208, img#16) (V) (T.A) # No photo taken |
| 19-Mar-2023 | 16:27:26 | 109 | ECR_ENV_37 | | | camera | 76 | 526626 | 6399284 | 526607 | 6399300 | 19 | -16 | 25 | -49 | DM | (Corr'd Nav, Kongsberg 14208, img#17) (V) (T.A) |
| 19-Mar-2023 | 16:27:39 | 110 | ECR_ENV_37 | | | camera | 75 | 526625 | 6399286 | 526607 | 6399300 | 18 | -15 | 23 | -51 | DM | (Corr'd Nav, Kongsberg 14208, img#18) (V) (T.A) |
| 19-Mar-2023 | 16:28:03 | 111 | ECR_ENV_37 | | | camera | 75 | 526622 | 6399288 | 526607 | 6399300 | 15 | -13 | 20 | -49 | DM | (Corr'd Nav, Kongsberg 14208, img#19) (V) (T.A) |
| 19-Mar-2023 | 16:28:18 | 112 | ECR_ENV_37 | | | camera | 75 | 526620 | 6399288 | 526607 | 6399300 | 13 | -12 | 18 | -47 | DM | (Corr'd Nav, Kongsberg 14208, img#20) (V) (T.A) |
| 19-Mar-2023 | 16:28:27 | 113 | ECR_ENV_37 | | | camera | 76 | 526620 | 6399289 | 526607 | 6399300 | 12 | -11 | 17 | -47 | DM | (Corr'd Nav, Kongsberg 14208, img#21) (V) (T.A) |
| 19-Mar-2023 | 16:28:49 | 114 | ECR_ENV_37 | | | camera | 75 | 526618 | 6399292 | 526607 | 6399300 | 10 | -8 | 13 | -51 | DM | (Corr'd Nav, Kongsberg 14208, img#22) (V) (T.A) |
| 19-Mar-2023 | 16:29:03 | 115 | ECR_ENV_37 | | | camera | 75 | 526616 | 6399293 | 526607 | 6399300 | 9 | -7 | 11 | -51 | DM | (Corr'd Nav, Kongsberg 14208, img#23) (V) (T.A) |
| 19-Mar-2023 | 16:29:18 | 116 | ECR_ENV_37 | | | camera | 75 | 526614 | 6399295 | 526607 | 6399300 | 7 | -5 | 9 | -54 | DM | (Corr'd Nav, Kongsberg 14208, img#24) (V) (T.A) |
| 19-Mar-2023 | 16:29:41 | 117 | ECR_ENV_37 | | | camera | 75 | 526613 | 6399297 | 526607 | 6399300 | 6 | -3 | 6 | -62 | DM | (Corr'd Nav, Kongsberg 14208, img#25) (V) (T.A) |
| 19-Mar-2023 | 16:30:05 | 118 | ECR_ENV_37 | | | camera | 76 | 526610 | 6399300 | 526607 | 6399300 | 3 | 0 | 3 | -80 | DM | (Corr'd Nav, Kongsberg 14208, img#26) (V) (T.A) |
| 19-Mar-2023 | 16:30:36 | 119 | ECR_ENV_37 | | | camera | 75 | 526606 | 6399303 | 526607 | 6399300 | -1 | 2 | 3 | 160 | DM | (Corr'd Nav, Kongsberg 14208, img#27) (V) (T.A) |
| 19-Mar-2023 | 16:30:57 | 120 | ECR_ENV_37 | | | camera | 75 | 526605 | 6399305 | 526607 | 6399300 | -3 | 5 | 6 | 151 | DM | (Corr'd Nav, Kongsberg 14208, img#28) (V) (T.A) |
| 19-Mar-2023 | 16:31:08 | 121 | ECR_ENV_37 | | | camera | 76 | 526604 | 6399306 | 526607 | 6399300 | -4 | 6 | 7 | 147 | DM | (Corr'd Nav, Kongsberg 14208, img#29) (V) (T.A) |
| 19-Mar-2023 | 16:31:24 | 122 | ECR_ENV_37 | | | camera | 76 | 526602 | 6399308 | 526607 | 6399300 | -6 | 8 | 9 | 144 | DM | (Corr'd Nav, Kongsberg 14208, img#30) (V) (T.A) |
| 19-Mar-2023 | 16:31:36 | 123 | ECR_ENV_37 | | | camera | 75 | 526601 | 6399309 | 526607 | 6399300 | -7 | 9 | 11 | 143 | DM | (Corr'd Nav, Kongsberg 14208, img#31) (V) (T.A) |
| 19-Mar-2023 | 16:32:24 | 124 | ECR_ENV_37 | | | camera | 76 | 526596 | 6399314 | 526607 | 6399300 | -11 | 14 | 17 | 141 | DM | (Corr'd Nav, Kongsberg 14208, img#32) (V) (T.A) |
| 19-Mar-2023 | 16:32:36 | 125 | ECR_ENV_37 | | | camera | 76 | 526596 | 6399315 | 526607 | 6399300 | -12 | 14 | 19 | 141 | DM | (Corr'd Nav, Kongsberg 14208, img#33) (V) (T.A) |
| 19-Mar-2023 | 16:33:03 | 126 | ECR_ENV_37 | | | camera | 76 | 526594 | 6399318 | 526607 | 6399300 | -13 | 18 | 22 | 144 | DM | (Corr'd Nav, Kongsberg 14208, img#34) (V) (T.A) |
| 19-Mar-2023 | 16:33:43 | 127 | ECR_ENV_37 | | | camera | 76 | 526591 | 6399323 | 526607 | 6399300 | -17 | 22 | 28 | 143 | DM | (Corr'd Nav, Kongsberg 14208, img#35) (V) (T.A) |
| 19-Mar-2023 | 16:34:00 | 128 | ECR_ENV_37 | | | camera | 76 | 526590 | 6399324 | 526607 | 6399300 | -17 | 24 | 29 | 144 | DM | (Corr'd Nav, Kongsberg 14208, img#36) (V) (T.A) |
| 19-Mar-2023 | 16:34:16 | 129 | ECR_ENV_37 | | | camera | 76 | 526589 | 6399327 | 526607 | 6399300 | -18 | 26 | 32 | 145 | DM | (Corr'd Nav, Kongsberg 14208, img#37) (V) (T.A) |
| 19-Mar-2023 | 16:34:28 | 130 | ECR_ENV_37 | | | camera | 76 | 526588 | 6399328 | 526607 | 6399300 | -19 | 28 | 34 | 145 | DM | (Corr'd Nav, Kongsberg 14208, img#38) (V) (T.A) |
| 19-Mar-2023 | 16:34:45 | 131 | ECR_ENV_37 | | | camera | 76 | 526587 | 6399329 | 526607 | 6399300 | -20 | 29 | 35 | 145 | DM | (Corr'd Nav, Kongsberg 14208, img#39) (V) (T.A) |
| 19-Mar-2023 | 16:35:24 | 132 | ECR_ENV_37 | | | camera | 76 | 526585 | 6399334 | 526607 | 6399300 | -23 | 34 | 41 | 146 | DM | (Corr'd Nav, Kongsberg 14208, img#40) (V) (T.A) |
| 19-Mar-2023 | 16:35:39 | 133 | ECR_ENV_37 | | | camera | 76 | 526583 | 6399336 | 526607 | 6399300 | -24 | 35 | 43 | 146 | DM | (Corr'd Nav, Kongsberg 14208, img#41) (V) (T.A) |
| 19-Mar-2023 | 16:36:10 | 134 | ECR_ENV_37 | | | camera | 76 | 526581 | 6399338 | 526607 | 6399300 | -26 | 38 | 46 | 145 | DM | (Corr'd Nav, Kongsberg 14208, img#42) (V) (T.A) |
| 19-Mar-2023 | 16:36:37 | 135 | ECR_ENV_37 | | | camera | 76 | 526580 | 6399341 | 526607 | 6399300 | -27 | 41 | 49 | 147 | DM | (Corr'd Nav, Kongsberg 14208, img#43) (V) (T.A) |
| 19-Mar-2023 | 17:56:42 | 136 | ECR_ENV_51 | | | camera | 98 | 527934 | 6400630 | 527934 | 6400689 | 0 | -59 | 59 | 0 | DM | (Corr'd Nav, Kongsberg 14208, img#1) (V) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | | Vertical / Tidal Datum | VORF, LAT | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 19-Mar-2023 | 17:56:49 | 137 | ECR_ENV_51 | | | camera | 98 | 527934 | 6400632 | 527934 | 6400689 | 0 | -57 | 57 | 0 | DM | (Corr'd Nav, Kongsberg 14208, img#2) (V) (T.A) |
| 19-Mar-2023 | 17:56:59 | 138 | ECR_ENV_51 | | | camera | 98 | 527933 | 6400634 | 527934 | 6400689 | -1 | -55 | 55 | 1 | DM | (Corr'd Nav, Kongsberg 14208, img#3) (V) (T.A) |
| 19-Mar-2023 | 17:57:19 | 139 | ECR_ENV_51 | | | camera | 98 | 527932 | 6400637 | 527934 | 6400689 | -2 | -52 | 52 | 2 | DM | (Corr'd Nav, Kongsberg 14208, img#4) (V) (T.A) |
| 19-Mar-2023 | 17:57:36 | 140 | ECR_ENV_51 | | | camera | 98 | 527931 | 6400639 | 527934 | 6400689 | -3 | -50 | 50 | 4 | DM | (Corr'd Nav, Kongsberg 14208, img#5) (V) (T.A) |
| 19-Mar-2023 | 17:57:52 | 141 | ECR_ENV_51 | | | camera | 98 | 527931 | 6400642 | 527934 | 6400689 | -3 | -47 | 47 | 3 | DM | (Corr'd Nav, Kongsberg 14208, img#6) (V) (T.A) |
| 19-Mar-2023 | 17:58:08 | 142 | ECR_ENV_51 | | | camera | 98 | 527932 | 6400643 | 527934 | 6400689 | -2 | -45 | 45 | 3 | DM | (Corr'd Nav, Kongsberg 14208, img#7) (V) (T.A) |
| 19-Mar-2023 | 17:58:37 | 143 | ECR_ENV_51 | | | camera | 98 | 527934 | 6400647 | 527934 | 6400689 | 0 | -41 | 41 | -1 | DM | (Corr'd Nav, Kongsberg 14208, img#8) (V) (T.A) |
| 19-Mar-2023 | 17:58:49 | 144 | ECR_ENV_51 | | | camera | 98 | 527934 | 6400649 | 527934 | 6400689 | 0 | -40 | 40 | 0 | DM | (Corr'd Nav, Kongsberg 14208, img#9) (V) (T.A) |
| 19-Mar-2023 | 17:59:06 | 145 | ECR_ENV_51 | | | camera | 98 | 527934 | 6400652 | 527934 | 6400689 | 0 | -37 | 36 | 1 | DM | (Corr'd Nav, Kongsberg 14208, img#10) (V) (T.A) |
| 19-Mar-2023 | 17:59:34 | 146 | ECR_ENV_51 | | | camera | 98 | 527933 | 6400656 | 527934 | 6400689 | -1 | -33 | 33 | 2 | DM | (Corr'd Nav, Kongsberg 14208, img#11) (V) (T.A) |
| 19-Mar-2023 | 17:59:45 | 147 | ECR_ENV_51 | | | camera | 98 | 527933 | 6400657 | 527934 | 6400689 | -1 | -32 | 32 | 3 | DM | (Corr'd Nav, Kongsberg 14208, img#12) (V) (T.A) |
| 19-Mar-2023 | 17:59:54 | 148 | ECR_ENV_51 | | | camera | 98 | 527932 | 6400659 | 527934 | 6400689 | -2 | -30 | 30 | 3 | DM | (Corr'd Nav, Kongsberg 14208, img#13) (V) (T.A) |
| 19-Mar-2023 | 18:00:08 | 149 | ECR_ENV_51 | | | camera | 98 | 527932 | 6400661 | 527934 | 6400689 | -2 | -28 | 28 | 4 | DM | (Corr'd Nav, Kongsberg 14208, img#14) (V) (T.A) |
| 19-Mar-2023 | 18:00:21 | 150 | ECR_ENV_51 | | | camera | 98 | 527932 | 6400663 | 527934 | 6400689 | -2 | -26 | 26 | 5 | DM | (Corr'd Nav, Kongsberg 14208, img#15) (V) (T.A) |
| 19-Mar-2023 | 18:00:49 | 151 | ECR_ENV_51 | | | camera | 98 | 527932 | 6400667 | 527934 | 6400689 | -2 | -21 | 21 | 7 | DM | (Corr'd Nav, Kongsberg 14208, img#16) (V) (T.A) |
| 19-Mar-2023 | 18:01:07 | 152 | ECR_ENV_51 | | | camera | 98 | 527931 | 6400669 | 527934 | 6400689 | -3 | -19 | 20 | 9 | DM | (Corr'd Nav, Kongsberg 14208, img#17) (V) (T.A) |
| 19-Mar-2023 | 18:01:35 | 153 | ECR_ENV_51 | | | camera | 98 | 527932 | 6400674 | 527934 | 6400689 | -2 | -14 | 14 | 7 | DM | (Corr'd Nav, Kongsberg 14208, img#18) (V) (T.A) |
| 19-Mar-2023 | 18:02:04 | 154 | ECR_ENV_51 | | | camera | 98 | 527932 | 6400679 | 527934 | 6400689 | -2 | -10 | 10 | 13 | DM | (Corr'd Nav, Kongsberg 14208, img#19) (V) (T.A) |
| 19-Mar-2023 | 18:02:20 | 155 | ECR_ENV_51 | | | camera | 98 | 527931 | 6400682 | 527934 | 6400689 | -3 | -7 | 8 | 23 | DM | (Corr'd Nav, Kongsberg 14208, img#20) (V) (T.A) |
| 19-Mar-2023 | 18:02:58 | 156 | ECR_ENV_51 | | | camera | 98 | 527928 | 6400687 | 527934 | 6400689 | -6 | -2 | 6 | 70 | DM | (Corr'd Nav, Kongsberg 14208, img#21) (V) (T.A) |
| 19-Mar-2023 | 18:03:23 | 157 | ECR_ENV_51 | | | camera | 98 | 527930 | 6400690 | 527934 | 6400689 | -4 | 1 | 4 | 101 | DM | (Corr'd Nav, Kongsberg 14208, img#22) (V) (T.A) |
| 19-Mar-2023 | 18:03:44 | 158 | ECR_ENV_51 | | | camera | 98 | 527934 | 6400692 | 527934 | 6400689 | 0 | 4 | 4 | -175 | DM | (Corr'd Nav, Kongsberg 14208, img#23) (V) (T.A) |
| 19-Mar-2023 | 18:03:52 | 159 | ECR_ENV_51 | | | camera | 98 | 527935 | 6400694 | 527934 | 6400689 | 1 | 5 | 5 | -169 | DM | (Corr'd Nav, Kongsberg 14208, img#24) (V) (T.A) |
| 19-Mar-2023 | 18:04:15 | 160 | ECR_ENV_51 | | | camera | 98 | 527934 | 6400698 | 527934 | 6400689 | 0 | 9 | 9 | -179 | DM | (Corr'd Nav, Kongsberg 14208, img#25) (V) (T.A) |
| 19-Mar-2023 | 18:04:40 | 161 | ECR_ENV_51 | | | camera | 98 | 527933 | 6400701 | 527934 | 6400689 | -1 | 12 | 12 | 175 | DM | (Corr'd Nav, Kongsberg 14208, img#26) (V) (T.A) |
| 19-Mar-2023 | 18:05:01 | 162 | ECR_ENV_51 | | | camera | 98 | 527931 | 6400704 | 527934 | 6400689 | -3 | 15 | 15 | 169 | DM | (Corr'd Nav, Kongsberg 14208, img#27) (V) (T.A) |
| 19-Mar-2023 | 18:05:21 | 163 | ECR_ENV_51 | | | camera | 98 | 527931 | 6400708 | 527934 | 6400689 | -3 | 19 | 20 | 170 | DM | (Corr'd Nav, Kongsberg 14208, img#28) (V) (T.A) |
| 19-Mar-2023 | 18:05:30 | 164 | ECR_ENV_51 | | | camera | 98 | 527930 | 6400710 | 527934 | 6400689 | -4 | 21 | 21 | 169 | DM | (Corr'd Nav, Kongsberg 14208, img#29) (V) (T.A) |
| 19-Mar-2023 | 18:05:50 | 165 | ECR_ENV_51 | | | camera | 98 | 527931 | 6400712 | 527934 | 6400689 | -4 | 24 | 24 | 172 | DM | (Corr'd Nav, Kongsberg 14208, img#30) (V) (T.A) |
| 19-Mar-2023 | 18:06:20 | 166 | ECR_ENV_51 | | | camera | 98 | 527933 | 6400716 | 527934 | 6400689 | -1 | 27 | 27 | 179 | DM | (Corr'd Nav, Kongsberg 14208, img#31) (V) (T.A) |
| 19-Mar-2023 | 18:06:31 | 167 | ECR_ENV_51 | | | camera | 98 | 527933 | 6400718 | 527934 | 6400689 | -1 | 29 | 29 | 179 | DM | (Corr'd Nav, Kongsberg 14208, img#32) (V) (T.A) |
| 19-Mar-2023 | 18:06:43 | 168 | ECR_ENV_51 | | | camera | 98 | 527933 | 6400720 | 527934 | 6400689 | -1 | 31 | 31 | 178 | DM | (Corr'd Nav, Kongsberg 14208, img#33) (V) (T.A) |
| 19-Mar-2023 | 18:06:53 | 169 | ECR_ENV_51 | | | camera | 98 | 527933 | 6400722 | 527934 | 6400689 | -1 | 33 | 33 | 178 | DM | (Corr'd Nav, Kongsberg 14208, img#34) (V) (T.A) |
| 19-Mar-2023 | 18:07:13 | 170 | ECR_ENV_51 | | | camera | 98 | 527932 | 6400723 | 527934 | 6400689 | -2 | 35 | 35 | 177 | DM | (Corr'd Nav, Kongsberg 14208, img#35) (V) (T.A) |
| 19-Mar-2023 | 18:07:42 | 171 | ECR_ENV_51 | | | camera | 98 | 527931 | 6400728 | 527934 | 6400689 | -3 | 39 | 39 | 176 | DM | (Corr'd Nav, Kongsberg 14208, img#36) (V) (T.A) |
| 19-Mar-2023 | 18:07:53 | 172 | ECR_ENV_51 | | | camera | 98 | 527930 | 6400729 | 527934 | 6400689 | -4 | 41 | 41 | 175 | DM | (Corr'd Nav, Kongsberg 14208, img#37) (V) (T.A) |
| 19-Mar-2023 | 18:08:02 | 173 | ECR_ENV_51 | | | camera | 98 | 527930 | 6400731 | 527934 | 6400689 | -4 | 42 | 42 | 175 | DM | (Corr'd Nav, Kongsberg 14208, img#38) (V) (T.A) |
| 19-Mar-2023 | 18:08:24 | 174 | ECR_ENV_51 | | | camera | 98 | 527932 | 6400736 | 527934 | 6400689 | -2 | 47 | 47 | 178 | DM | (Corr'd Nav, Kongsberg 14208, img#39) (V) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | | Vertical / Tidal Datum | VORF, LAT | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 19-Mar-2023 | 19:17:01 | 175 | ECR_ENV_52 | | | camera | 93 | 525145 | 6402514 | 525152 | 6402576 | -8 | -61 | 62 | 7 | DM | (Corr'd Nav, Kongsberg 14208, img#1) (V) (T.A) |
| 19-Mar-2023 | 19:17:13 | 176 | ECR_ENV_52 | | | camera | 93 | 525144 | 6402515 | 525152 | 6402576 | -8 | -61 | 61 | 8 | DM | (Corr'd Nav, Kongsberg 14208, img#2) (V) (T.A) |
| 19-Mar-2023 | 19:17:22 | 177 | ECR_ENV_52 | | | camera | 93 | 525145 | 6402516 | 525152 | 6402576 | -8 | -59 | 60 | 7 | DM | (Corr'd Nav, Kongsberg 14208, img#3) (V) (T.A) |
| 19-Mar-2023 | 19:17:32 | 178 | ECR_ENV_52 | | | camera | 93 | 525145 | 6402518 | 525152 | 6402576 | -7 | -58 | 58 | 7 | DM | (Corr'd Nav, Kongsberg 14208, img#4) (V) (T.A) |
| 19-Mar-2023 | 19:17:47 | 179 | ECR_ENV_52 | | | camera | 93 | 525147 | 6402521 | 525152 | 6402576 | -6 | -55 | 55 | 6 | DM | (Corr'd Nav, Kongsberg 14208, img#5) (V) (T.A) |
| 19-Mar-2023 | 19:17:59 | 180 | ECR_ENV_52 | | | camera | 93 | 525147 | 6402522 | 525152 | 6402576 | -5 | -53 | 53 | 6 | DM | (Corr'd Nav, Kongsberg 14208, img#6) (V) (T.A) |
| 19-Mar-2023 | 19:18:13 | 181 | ECR_ENV_52 | | | camera | 93 | 525147 | 6402524 | 525152 | 6402576 | -5 | -52 | 52 | 6 | DM | (Corr'd Nav, Kongsberg 14208, img#7) (V) (T.A) |
| 19-Mar-2023 | 19:18:25 | 182 | ECR_ENV_52 | | | camera | 93 | 525148 | 6402525 | 525152 | 6402576 | -4 | -51 | 51 | 5 | DM | (Corr'd Nav, Kongsberg 14208, img#8) (V) (T.A) |
| 19-Mar-2023 | 19:18:57 | 183 | ECR_ENV_52 | | | camera | 93 | 525148 | 6402531 | 525152 | 6402576 | -4 | -44 | 45 | 5 | DM | (Corr'd Nav, Kongsberg 14208, img#9) (V) (T.A) |
| 19-Mar-2023 | 19:19:06 | 184 | ECR_ENV_52 | | | camera | 93 | 525148 | 6402533 | 525152 | 6402576 | -4 | -43 | 43 | 6 | DM | (Corr'd Nav, Kongsberg 14208, img#10) (V) (T.A) |
| 19-Mar-2023 | 19:19:17 | 185 | ECR_ENV_52 | | | camera | 93 | 525147 | 6402534 | 525152 | 6402576 | -5 | -41 | 42 | 7 | | (Corr'd Nav, Kongsberg 14208, img#11) (V) (T.A)<br># No photo taken |
| 19-Mar-2023 | 19:19:20 | 186 | ECR_ENV_52 | | | camera | 93 | 525147 | 6402535 | 525152 | 6402576 | -5 | -41 | 41 | 7 | DM | (Corr'd Nav, Kongsberg 14208, img#12) (V) (T.A) |
| 19-Mar-2023 | 19:19:31 | 187 | ECR_ENV_52 | | | camera | 93 | 525147 | 6402536 | 525152 | 6402576 | -6 | -40 | 40 | 8 | DM | (Corr'd Nav, Kongsberg 14208, img#13) (V) (T.A) |
| 19-Mar-2023 | 19:19:59 | 188 | ECR_ENV_52 | | | camera | 93 | 525148 | 6402540 | 525152 | 6402576 | -5 | -35 | 36 | 7 | DM | (Corr'd Nav, Kongsberg 14208, img#14) (V) (T.A) |
| 19-Mar-2023 | 19:20:10 | 189 | ECR_ENV_52 | | | camera | 93 | 525147 | 6402542 | 525152 | 6402576 | -5 | -34 | 34 | 8 | DM | (Corr'd Nav, Kongsberg 14208, img#15) (V) (T.A) |
| 19-Mar-2023 | 19:20:30 | 190 | ECR_ENV_52 | | | camera | 93 | 525147 | 6402545 | 525152 | 6402576 | -5 | -31 | 31 | 9 | DM | (Corr'd Nav, Kongsberg 14208, img#16) (V) (T.A) |
| 19-Mar-2023 | 19:20:39 | 191 | ECR_ENV_52 | | | camera | 93 | 525147 | 6402546 | 525152 | 6402576 | -5 | -29 | 30 | 10 | DM | (Corr'd Nav, Kongsberg 14208, img#17) (V) (T.A) |
| 19-Mar-2023 | 19:20:48 | 192 | ECR_ENV_52 | | | camera | 93 | 525147 | 6402547 | 525152 | 6402576 | -6 | -28 | 29 | 11 | DM | (Corr'd Nav, Kongsberg 14208, img#18) (V) (T.A) |
| 19-Mar-2023 | 19:21:04 | 193 | ECR_ENV_52 | | | camera | 93 | 525148 | 6402549 | 525152 | 6402576 | -5 | -27 | 27 | 10 | DM | (Corr'd Nav, Kongsberg 14208, img#19) (V) (T.A) |
| 19-Mar-2023 | 19:21:23 | 194 | ECR_ENV_52 | | | camera | 93 | 525151 | 6402552 | 525152 | 6402576 | -1 | -24 | 24 | 3 | DM | (Corr'd Nav, Kongsberg 14208, img#20) (V) (T.A) |
| 19-Mar-2023 | 19:21:44 | 195 | ECR_ENV_52 | | | camera | 93 | 525152 | 6402554 | 525152 | 6402576 | 0 | -22 | 21 | 0 | DM | (Corr'd Nav, Kongsberg 14208, img#21) (V) (T.A) |
| 19-Mar-2023 | 19:22:04 | 196 | ECR_ENV_52 | | | camera | 93 | 525152 | 6402558 | 525152 | 6402576 | 0 | -18 | 18 | 0 | DM | (Corr'd Nav, Kongsberg 14208, img#22) (V) (T.A) |
| 19-Mar-2023 | 19:22:19 | 197 | ECR_ENV_52 | | | camera | 93 | 525153 | 6402561 | 525152 | 6402576 | 0 | -15 | 15 | -2 | DM | (Corr'd Nav, Kongsberg 14208, img#23) (V) (T.A) |
| 19-Mar-2023 | 19:22:34 | 198 | ECR_ENV_52 | | | camera | 93 | 525153 | 6402563 | 525152 | 6402576 | 0 | -12 | 12 | -2 | DM | (Corr'd Nav, Kongsberg 14208, img#24) (V) (T.A) |
| 19-Mar-2023 | 19:22:47 | 199 | ECR_ENV_52 | | | camera | 93 | 525152 | 6402565 | 525152 | 6402576 | 0 | -10 | 10 | 0 | DM | (Corr'd Nav, Kongsberg 14208, img#25) (V) (T.A) |
| 19-Mar-2023 | 19:23:08 | 200 | ECR_ENV_52 | | | camera | 93 | 525152 | 6402568 | 525152 | 6402576 | 0 | -7 | 7 | -1 | DM | (Corr'd Nav, Kongsberg 14208, img#26) (V) (T.A) |
| 19-Mar-2023 | 19:23:23 | 201 | ECR_ENV_52 | | | camera | 93 | 525153 | 6402571 | 525152 | 6402576 | 1 | -5 | 5 | -11 | DM | (Corr'd Nav, Kongsberg 14208, img#27) (V) (T.A) |
| 19-Mar-2023 | 19:23:48 | 202 | ECR_ENV_52 | | | camera | 93 | 525153 | 6402574 | 525152 | 6402576 | 1 | -1 | 2 | -22 | DM | (Corr'd Nav, Kongsberg 14208, img#28) (V) (T.A) |
| 19-Mar-2023 | 19:24:05 | 203 | ECR_ENV_52 | | | camera | 93 | 525153 | 6402578 | 525152 | 6402576 | 1 | 2 | 2 | -154 | DM | (Corr'd Nav, Kongsberg 14208, img#29) (V) (T.A) |
| 19-Mar-2023 | 19:24:22 | 204 | ECR_ENV_52 | | | camera | 93 | 525153 | 6402580 | 525152 | 6402576 | 1 | 5 | 5 | -174 | DM | (Corr'd Nav, Kongsberg 14208, img#30) (V) (T.A) |
| 19-Mar-2023 | 19:24:44 | 205 | ECR_ENV_52 | | | camera | 93 | 525152 | 6402584 | 525152 | 6402576 | -1 | 8 | 8 | 175 | DM | (Corr'd Nav, Kongsberg 14208, img#31) (V) (T.A) |
| 19-Mar-2023 | 19:24:58 | 206 | ECR_ENV_52 | | | camera | 93 | 525151 | 6402586 | 525152 | 6402576 | -1 | 11 | 11 | 174 | DM | (Corr'd Nav, Kongsberg 14208, img#32) (V) (T.A) |
| 19-Mar-2023 | 19:25:30 | 207 | ECR_ENV_52 | | | camera | 93 | 525149 | 6402591 | 525152 | 6402576 | -3 | 16 | 16 | 170 | DM | (Corr'd Nav, Kongsberg 14208, img#33) (V) (T.A) |
| 19-Mar-2023 | 19:26:28 | 208 | ECR_ENV_52 | | | camera | 93 | 525150 | 6402599 | 525152 | 6402576 | -2 | 23 | 23 | 175 | DM | (Corr'd Nav, Kongsberg 14208, img#34) (V) (T.A) |
| 19-Mar-2023 | 19:26:58 | 209 | ECR_ENV_52 | | | camera | 93 | 525151 | 6402604 | 525152 | 6402576 | -1 | 28 | 28 | 178 | DM | (Corr'd Nav, Kongsberg 14208, img#35) (V) (T.A) |
| 19-Mar-2023 | 19:27:19 | 210 | ECR_ENV_52 | | | camera | 93 | 525150 | 6402606 | 525152 | 6402576 | -2 | 30 | 30 | 176 | DM | (Corr'd Nav, Kongsberg 14208, img#36) (V) (T.A) |
| 19-Mar-2023 | 19:27:37 | 211 | ECR_ENV_52 | | | camera | 93 | 525149 | 6402607 | 525152 | 6402576 | -3 | 31 | 31 | 174 | DM | (Corr'd Nav, Kongsberg 14208, img#37) (V) (T.A) |
| 19-Mar-2023 | 19:27:49 | 212 | ECR_ENV_52 | | | camera | 93 | 525149 | 6402608 | 525152 | 6402576 | -4 | 32 | 32 | 174 | DM | (Corr'd Nav, Kongsberg 14208, img#38) (V) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | | | Vessel | MV *Ocean Endeavour* | | | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | | | Vessel Reference Point (VRP) | COG | | | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | | | Deployment Location | Camera Deployment Node | | x | 6.7 | y | 21.94 | z | 2.93 | |
| Primary Positioning System | Starpack 1 | | | | | Actual Coordinates derived from | Vessel | | | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | | Ellipsoid | WGS 84 | | Projection | UTM zone 30N | | | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 19-Mar-2023 | 19:28:21 | 213 | ECR_ENV_52 | | | camera | 93 | 525149 | 6402613 | 525152 | 6402576 | -3 | 37 | 37 | 176 | DM | (Corr'd Nav, Kongsberg 14208, img#39) (V) (T.A) |
| 19-Mar-2023 | 19:29:04 | 214 | ECR_ENV_52 | | | camera | 93 | 525148 | 6402620 | 525152 | 6402576 | -4 | 44 | 44 | 175 | DM | (Corr'd Nav, Kongsberg 14208, img#40) (V) (T.A) |
| 19-Mar-2023 | 19:29:23 | 215 | ECR_ENV_52 | | | camera | 93 | 525148 | 6402622 | 525152 | 6402576 | -5 | 46 | 46 | 174 | | (Corr'd Nav, Kongsberg 14208, img#41) (V) (T.A) # No photo taken |
| 19-Mar-2023 | 20:49:35 | 216 | ECR_ENV_50 | | | camera | 98 | 529445 | 6403681 | 529507 | 6403681 | -62 | -1 | 62 | 89 | DM | (Corr'd Nav, Kongsberg 14208, img#1) (V) (T.A) |
| 19-Mar-2023 | 20:49:47 | 217 | ECR_ENV_50 | | | camera | 98 | 529446 | 6403680 | 529507 | 6403681 | -61 | -1 | 61 | 89 | DM | (Corr'd Nav, Kongsberg 14208, img#2) (V) (T.A) |
| 19-Mar-2023 | 20:50:07 | 218 | ECR_ENV_50 | | | camera | 98 | 529449 | 6403678 | 529507 | 6403681 | -58 | -3 | 58 | 87 | DM | (Corr'd Nav, Kongsberg 14208, img#3) (V) (T.A) |
| 19-Mar-2023 | 20:50:16 | 219 | ECR_ENV_50 | | | camera | 98 | 529451 | 6403678 | 529507 | 6403681 | -56 | -3 | 56 | 87 | DM | (Corr'd Nav, Kongsberg 14208, img#4) (V) (T.A) |
| 19-Mar-2023 | 20:50:29 | 220 | ECR_ENV_50 | | | camera | 98 | 529453 | 6403678 | 529507 | 6403681 | -54 | -4 | 54 | 86 | DM | (Corr'd Nav, Kongsberg 14208, img#5) (V) (T.A) |
| 19-Mar-2023 | 20:51:05 | 221 | ECR_ENV_50 | | | camera | 98 | 529460 | 6403680 | 529507 | 6403681 | -47 | -1 | 47 | 89 | DM | (Corr'd Nav, Kongsberg 14208, img#6) (V) (T.A) |
| 19-Mar-2023 | 20:51:18 | 222 | ECR_ENV_50 | | | camera | 98 | 529463 | 6403681 | 529507 | 6403681 | -45 | 0 | 45 | 90 | DM | (Corr'd Nav, Kongsberg 14208, img#7) (V) (T.A) |
| 19-Mar-2023 | 20:51:35 | 223 | ECR_ENV_50 | | | camera | 98 | 529466 | 6403682 | 529507 | 6403681 | -42 | 1 | 42 | 91 | DM | (Corr'd Nav, Kongsberg 14208, img#8) (V) (T.A) |
| 19-Mar-2023 | 20:51:53 | 224 | ECR_ENV_50 | | | camera | 98 | 529468 | 6403680 | 529507 | 6403681 | -40 | -1 | 40 | 88 | DM | (Corr'd Nav, Kongsberg 14208, img#9) (V) (T.A) |
| 19-Mar-2023 | 20:52:07 | 225 | ECR_ENV_50 | | | camera | 98 | 529470 | 6403679 | 529507 | 6403681 | -38 | -2 | 38 | 87 | DM | (Corr'd Nav, Kongsberg 14208, img#10) (V) (T.A) |
| 19-Mar-2023 | 20:52:23 | 226 | ECR_ENV_50 | | | camera | 98 | 529472 | 6403679 | 529507 | 6403681 | -36 | -3 | 36 | 86 | DM | (Corr'd Nav, Kongsberg 14208, img#11) (V) (T.A) |
| 19-Mar-2023 | 20:52:42 | 227 | ECR_ENV_50 | | | camera | 98 | 529474 | 6403678 | 529507 | 6403681 | -33 | -3 | 34 | 84 | DM | (Corr'd Nav, Kongsberg 14208, img#12) (V) (T.A) |
| 19-Mar-2023 | 20:53:00 | 228 | ECR_ENV_50 | | | camera | 98 | 529477 | 6403677 | 529507 | 6403681 | -31 | -5 | 31 | 82 | DM | (Corr'd Nav, Kongsberg 14208, img#13) (V) (T.A) |
| 19-Mar-2023 | 20:53:29 | 229 | ECR_ENV_50 | | | camera | 98 | 529479 | 6403677 | 529507 | 6403681 | -28 | -4 | 29 | 81 | DM | (Corr'd Nav, Kongsberg 14208, img#14) (V) (T.A) |
| 19-Mar-2023 | 20:53:36 | 230 | ECR_ENV_50 | | | camera | 98 | 529480 | 6403678 | 529507 | 6403681 | -27 | -3 | 27 | 83 | DM | (Corr'd Nav, Kongsberg 14208, img#15) (V) (T.A) |
| 19-Mar-2023 | 20:54:04 | 231 | ECR_ENV_50 | | | camera | 98 | 529486 | 6403680 | 529507 | 6403681 | -21 | -2 | 21 | 86 | DM | (Corr'd Nav, Kongsberg 14208, img#16) (V) (T.A) |
| 19-Mar-2023 | 20:54:22 | 232 | ECR_ENV_50 | | | camera | 98 | 529489 | 6403681 | 529507 | 6403681 | -18 | -1 | 18 | 88 | DM | (Corr'd Nav, Kongsberg 14208, img#17) (V) (T.A) |
| 19-Mar-2023 | 20:54:33 | 233 | ECR_ENV_50 | | | camera | 98 | 529491 | 6403681 | 529507 | 6403681 | -16 | 0 | 16 | 89 | DM | (Corr'd Nav, Kongsberg 14208, img#18) (V) (T.A) |
| 19-Mar-2023 | 20:54:44 | 234 | ECR_ENV_50 | | | camera | 98 | 529493 | 6403681 | 529507 | 6403681 | -14 | 0 | 14 | 90 | DM | (Corr'd Nav, Kongsberg 14208, img#19) (V) (T.A) |
| 19-Mar-2023 | 20:55:04 | 235 | ECR_ENV_50 | | | camera | 98 | 529496 | 6403682 | 529507 | 6403681 | -12 | 1 | 12 | 94 | DM | (Corr'd Nav, Kongsberg 14208, img#20) (V) (T.A) |
| 19-Mar-2023 | 20:55:25 | 236 | ECR_ENV_50 | | | camera | 98 | 529499 | 6403683 | 529507 | 6403681 | -9 | 2 | 9 | 102 | DM | (Corr'd Nav, Kongsberg 14208, img#21) (V) (T.A) |
| 19-Mar-2023 | 20:55:38 | 237 | ECR_ENV_50 | | | camera | 98 | 529501 | 6403684 | 529507 | 6403681 | -7 | 2 | 7 | 110 | DM | (Corr'd Nav, Kongsberg 14208, img#22) (V) (T.A) |
| 19-Mar-2023 | 20:56:06 | 238 | ECR_ENV_50 | | | camera | 98 | 529504 | 6403684 | 529507 | 6403681 | -4 | 3 | 5 | 126 | DM | (Corr'd Nav, Kongsberg 14208, img#23) (V) (T.A) |
| 19-Mar-2023 | 20:56:21 | 239 | ECR_ENV_50 | | | camera | 98 | 529505 | 6403683 | 529507 | 6403681 | -3 | 2 | 3 | 121 | DM | (Corr'd Nav, Kongsberg 14208, img#24) (V) (T.A) |
| 19-Mar-2023 | 20:56:33 | 240 | ECR_ENV_50 | | | camera | 98 | 529505 | 6403682 | 529507 | 6403681 | -2 | 0 | 2 | 102 | DM | (Corr'd Nav, Kongsberg 14208, img#25) (V) (T.A) |
| 19-Mar-2023 | 20:56:57 | 241 | ECR_ENV_50 | | | camera | 98 | 529507 | 6403682 | 529507 | 6403681 | 0 | 1 | 1 | 157 | DM | (Corr'd Nav, Kongsberg 14208, img#26) (V) (T.A) |
| 19-Mar-2023 | 20:57:22 | 242 | ECR_ENV_50 | | | camera | 98 | 529510 | 6403683 | 529507 | 6403681 | 2 | 2 | 3 | -129 | DM | (Corr'd Nav, Kongsberg 14208, img#27) (V) (T.A) |
| 19-Mar-2023 | 20:57:37 | 243 | ECR_ENV_50 | | | camera | 98 | 529513 | 6403683 | 529507 | 6403681 | 5 | 2 | 5 | -107 | DM | (Corr'd Nav, Kongsberg 14208, img#28) (V) (T.A) |
| 19-Mar-2023 | 20:58:10 | 244 | ECR_ENV_50 | | | camera | 98 | 529517 | 6403683 | 529507 | 6403681 | 9 | 2 | 10 | -100 | DM | (Corr'd Nav, Kongsberg 14208, img#29) (V) (T.A) |
| 19-Mar-2023 | 20:58:30 | 245 | ECR_ENV_50 | | | camera | 98 | 529519 | 6403684 | 529507 | 6403681 | 12 | 3 | 12 | -104 | DM | (Corr'd Nav, Kongsberg 14208, img#30) (V) (T.A) |
| 19-Mar-2023 | 20:58:40 | 246 | ECR_ENV_50 | | | camera | 98 | 529521 | 6403685 | 529507 | 6403681 | 14 | 4 | 14 | -105 | DM | (Corr'd Nav, Kongsberg 14208, img#31) (V) (T.A) |
| 19-Mar-2023 | 20:58:58 | 247 | ECR_ENV_50 | | | camera | 98 | 529523 | 6403685 | 529507 | 6403681 | 16 | 3 | 16 | -102 | DM | (Corr'd Nav, Kongsberg 14208, img#32) (V) (T.A) |
| 19-Mar-2023 | 20:59:18 | 248 | ECR_ENV_50 | | | camera | 98 | 529525 | 6403685 | 529507 | 6403681 | 18 | 3 | 18 | -101 | DM | (Corr'd Nav, Kongsberg 14208, img#33) (V) (T.A) |
| 19-Mar-2023 | 20:59:39 | 249 | ECR_ENV_50 | | | camera | 98 | 529527 | 6403685 | 529507 | 6403681 | 19 | 4 | 20 | -101 | DM | (Corr'd Nav, Kongsberg 14208, img#34) (V) (T.A) |
| 19-Mar-2023 | 20:59:59 | 250 | ECR_ENV_50 | | | camera | 98 | 529529 | 6403684 | 529507 | 6403681 | 21 | 3 | 21 | -98 | DM | (Corr'd Nav, Kongsberg 14208, img#35) (V) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 19-Mar-2023 | 21:00:06 | 251 | ECR_ENV_50 | | | camera | 98 | 529529 | 6403684 | 529507 | 6403681 | 22 | 3 | 22 | -97 | DM | (Corr'd Nav, Kongsberg 14208, img#36) (V) (T.A) |
| 19-Mar-2023 | 21:00:21 | 252 | ECR_ENV_50 | | | camera | 98 | 529530 | 6403684 | 529507 | 6403681 | 22 | 2 | 22 | -96 | DM | (Corr'd Nav, Kongsberg 14208, img#37) (V) (T.A) |
| 19-Mar-2023 | 21:00:44 | 253 | ECR_ENV_50 | | | camera | 98 | 529532 | 6403685 | 529507 | 6403681 | 25 | 4 | 25 | -99 | DM | (Corr'd Nav, Kongsberg 14208, img#38) (V) (T.A) |
| 19-Mar-2023 | 21:01:04 | 254 | ECR_ENV_50 | | | camera | 98 | 529535 | 6403687 | 529507 | 6403681 | 28 | 5 | 28 | -101 | DM | (Corr'd Nav, Kongsberg 14208, img#39) (V) (T.A) |
| 19-Mar-2023 | 21:01:29 | 255 | ECR_ENV_50 | | | camera | 98 | 529540 | 6403686 | 529507 | 6403681 | 33 | 4 | 33 | -98 | DM | (Corr'd Nav, Kongsberg 14208, img#40) (V) (T.A) |
| 19-Mar-2023 | 21:01:54 | 256 | ECR_ENV_50 | | | camera | 98 | 529543 | 6403686 | 529507 | 6403681 | 36 | 4 | 36 | -97 | DM | (Corr'd Nav, Kongsberg 14208, img#41) (V) (T.A) |
| 19-Mar-2023 | 21:02:37 | 257 | ECR_ENV_50 | | | camera | 98 | 529548 | 6403686 | 529507 | 6403681 | 41 | 5 | 41 | -96 | DM | (Corr'd Nav, Kongsberg 14208, img#42) (V) (T.A) |
| 19-Mar-2023 | 21:03:40 | 258 | ECR_ENV_50 | | | camera | 98 | 529558 | 6403686 | 529507 | 6403681 | 50 | 5 | 51 | -95 | DM | (Corr'd Nav, Kongsberg 14208, img#43) (V) (T.A) |
| 19-Mar-2023 | 22:11:21 | 259 | ECR_ENV_49 | | | camera | 71 | 526385 | 6405001 | 526330 | 6405008 | 55 | -7 | 56 | -83 | DM | (Corr'd Nav, Kongsberg 14208, img#1) (V) (T.A) |
| 19-Mar-2023 | 22:11:35 | 260 | ECR_ENV_49 | | | camera | 71 | 526385 | 6405001 | 526330 | 6405008 | 55 | -7 | 55 | -83 | DM | (Corr'd Nav, Kongsberg 14208, img#2) (V) (T.A) |
| 19-Mar-2023 | 22:11:58 | 261 | ECR_ENV_49 | | | camera | 71 | 526382 | 6404999 | 526330 | 6405008 | 52 | -9 | 53 | -80 | DM | (Corr'd Nav, Kongsberg 14208, img#3) (V) (T.A) |
| 19-Mar-2023 | 22:12:11 | 262 | ECR_ENV_49 | | | camera | 71 | 526380 | 6404997 | 526330 | 6405008 | 50 | -11 | 51 | -77 | DM | (Corr'd Nav, Kongsberg 14208, img#4) (V) (T.A) |
| 19-Mar-2023 | 22:12:43 | 263 | ECR_ENV_49 | | | camera | 71 | 526373 | 6404998 | 526330 | 6405008 | 44 | -10 | 45 | -77 | DM | (Corr'd Nav, Kongsberg 14208, img#5) (V) (T.A) |
| 19-Mar-2023 | 22:12:50 | 264 | ECR_ENV_49 | | | camera | 71 | 526373 | 6404999 | 526330 | 6405008 | 43 | -10 | 44 | -77 | DM | (Corr'd Nav, Kongsberg 14208, img#6) (V) (T.A) |
| 19-Mar-2023 | 22:13:00 | 265 | ECR_ENV_49 | | | camera | 71 | 526372 | 6404998 | 526330 | 6405008 | 42 | -10 | 43 | -77 | DM | (Corr'd Nav, Kongsberg 14208, img#7) (V) (T.A) |
| 19-Mar-2023 | 22:13:08 | 266 | ECR_ENV_49 | | | camera | 71 | 526371 | 6404998 | 526330 | 6405008 | 42 | -10 | 43 | -77 | DM | (Corr'd Nav, Kongsberg 14208, img#8) (V) (T.A) |
| 19-Mar-2023 | 22:13:21 | 267 | ECR_ENV_49 | | | camera | 71 | 526370 | 6404999 | 526330 | 6405008 | 40 | -9 | 41 | -77 | DM | (Corr'd Nav, Kongsberg 14208, img#9) (V) (T.A) |
| 19-Mar-2023 | 22:13:36 | 268 | ECR_ENV_49 | | | camera | 71 | 526368 | 6405000 | 526330 | 6405008 | 38 | -8 | 39 | -79 | DM | (Corr'd Nav, Kongsberg 14208, img#10) (V) (T.A) |
| 19-Mar-2023 | 22:14:04 | 269 | ECR_ENV_49 | | | camera | 71 | 526366 | 6405000 | 526330 | 6405008 | 37 | -8 | 38 | -78 | DM | (Corr'd Nav, Kongsberg 14208, img#11) (V) (T.A) |
| 19-Mar-2023 | 22:14:15 | 270 | ECR_ENV_49 | | | camera | 71 | 526364 | 6404999 | 526330 | 6405008 | 35 | -9 | 36 | -76 | DM | (Corr'd Nav, Kongsberg 14208, img#12) (V) (T.A) |
| 19-Mar-2023 | 22:14:25 | 271 | ECR_ENV_49 | | | camera | 71 | 526363 | 6404999 | 526330 | 6405008 | 33 | -9 | 34 | -75 | DM | (Corr'd Nav, Kongsberg 14208, img#13) (V) (T.A) |
| 19-Mar-2023 | 22:14:44 | 272 | ECR_ENV_49 | | | camera | 71 | 526359 | 6405000 | 526330 | 6405008 | 29 | -8 | 30 | -75 | DM | (Corr'd Nav, Kongsberg 14208, img#14) (V) (T.A) |
| 19-Mar-2023 | 22:15:00 | 273 | ECR_ENV_49 | | | camera | 71 | 526356 | 6405000 | 526330 | 6405008 | 27 | -8 | 28 | -73 | DM | (Corr'd Nav, Kongsberg 14208, img#15) (V) (T.A) |
| 19-Mar-2023 | 22:15:12 | 274 | ECR_ENV_49 | | | camera | 71 | 526355 | 6405000 | 526330 | 6405008 | 25 | -9 | 27 | -71 | DM | (Corr'd Nav, Kongsberg 14208, img#16) (V) (T.A) |
| 19-Mar-2023 | 22:15:27 | 275 | ECR_ENV_49 | | | camera | 71 | 526353 | 6404999 | 526330 | 6405008 | 24 | -10 | 26 | -68 | DM | (Corr'd Nav, Kongsberg 14208, img#17) (V) (T.A) |
| 19-Mar-2023 | 22:15:47 | 276 | ECR_ENV_49 | | | camera | 71 | 526351 | 6405000 | 526330 | 6405008 | 21 | -8 | 23 | -70 | DM | (Corr'd Nav, Kongsberg 14208, img#18) (V) (T.A) |
| 19-Mar-2023 | 22:16:06 | 277 | ECR_ENV_49 | | | camera | 71 | 526350 | 6405001 | 526330 | 6405008 | 20 | -7 | 21 | -70 | DM | (Corr'd Nav, Kongsberg 14208, img#19) (V) (T.A) |
| 19-Mar-2023 | 22:16:38 | 278 | ECR_ENV_49 | | | camera | 72 | 526343 | 6404999 | 526330 | 6405008 | 14 | -9 | 16 | -57 | DM | (Corr'd Nav, Kongsberg 14208, img#20) (V) (T.A) |
| 19-Mar-2023 | 22:16:57 | 279 | ECR_ENV_49 | | | camera | 72 | 526340 | 6405000 | 526330 | 6405008 | 11 | -8 | 13 | -54 | DM | (Corr'd Nav, Kongsberg 14208, img#21) (V) (T.A) |
| 19-Mar-2023 | 22:17:26 | 280 | ECR_ENV_49 | | | camera | 72 | 526337 | 6405002 | 526330 | 6405008 | 8 | -6 | 10 | -53 | DM | (Corr'd Nav, Kongsberg 14208, img#22) (V) (T.A) |
| 19-Mar-2023 | 22:17:50 | 281 | ECR_ENV_49 | | | camera | 72 | 526335 | 6405003 | 526330 | 6405008 | 5 | -6 | 8 | -45 | DM | (Corr'd Nav, Kongsberg 14208, img#23) (V) (T.A) |
| 19-Mar-2023 | 22:18:21 | 282 | ECR_ENV_49 | | | camera | 72 | 526332 | 6405006 | 526330 | 6405008 | 3 | -3 | 4 | -48 | DM | (Corr'd Nav, Kongsberg 14208, img#24) (V) (T.A) |
| 19-Mar-2023 | 22:18:44 | 283 | ECR_ENV_49 | | | camera | 72 | 526332 | 6405007 | 526330 | 6405008 | 2 | -1 | 2 | -65 | DM | (Corr'd Nav, Kongsberg 14208, img#25) (V) (T.A) |
| 19-Mar-2023 | 22:19:15 | 284 | ECR_ENV_49 | | | camera | 72 | 526331 | 6405007 | 526330 | 6405008 | 1 | -1 | 1 | -55 | DM | (Corr'd Nav, Kongsberg 14208, img#26) (V) (T.A) |
| 19-Mar-2023 | 22:19:27 | 285 | ECR_ENV_49 | | | camera | 72 | 526329 | 6405007 | 526330 | 6405008 | -1 | -1 | 1 | 33 | DM | (Corr'd Nav, Kongsberg 14208, img#27) (V) (T.A) |
| 19-Mar-2023 | 22:20:01 | 286 | ECR_ENV_49 | | | camera | 72 | 526324 | 6405008 | 526330 | 6405008 | -6 | 0 | 6 | 86 | DM | (Corr'd Nav, Kongsberg 14208, img#28) (V) (T.A) |
| 19-Mar-2023 | 22:20:19 | 287 | ECR_ENV_49 | | | camera | 72 | 526320 | 6405006 | 526330 | 6405008 | -10 | -2 | 10 | 77 | DM | (Corr'd Nav, Kongsberg 14208, img#29) (V) (T.A) |
| 19-Mar-2023 | 22:20:31 | 288 | ECR_ENV_49 | | | camera | 72 | 526318 | 6405004 | 526330 | 6405008 | -11 | -4 | 12 | 72 | DM | (Corr'd Nav, Kongsberg 14208, img#30) (V) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 19-Mar-2023 | 22:21:00 | 289 | ECR_ENV_49 | | | camera | 72 | 526312 | 6405003 | 526330 | 6405008 | -18 | -6 | 19 | 73 | DM | (Corr'd Nav, Kongsberg 14208, img#31) (V) (T.A) |
| 19-Mar-2023 | 22:21:11 | 290 | ECR_ENV_49 | | | camera | 72 | 526310 | 6405001 | 526330 | 6405008 | -20 | -7 | 21 | 70 | DM | (Corr'd Nav, Kongsberg 14208, img#32) (V) (T.A) |
| 19-Mar-2023 | 22:21:21 | 291 | ECR_ENV_49 | | | camera | 72 | 526308 | 6405000 | 526330 | 6405008 | -21 | -9 | 23 | 68 | DM | (Corr'd Nav, Kongsberg 14208, img#33) (V) (T.A) |
| 19-Mar-2023 | 22:21:41 | 292 | ECR_ENV_49 | | | camera | 73 | 526305 | 6404998 | 526330 | 6405008 | -25 | -10 | 27 | 67 | DM | (Corr'd Nav, Kongsberg 14208, img#34) (V) (T.A) |
| 19-Mar-2023 | 22:21:53 | 293 | ECR_ENV_49 | | | camera | 72 | 526303 | 6404997 | 526330 | 6405008 | -27 | -11 | 29 | 67 | DM | (Corr'd Nav, Kongsberg 14208, img#35) (V) (T.A) |
| 19-Mar-2023 | 22:22:08 | 294 | ECR_ENV_49 | | | camera | 73 | 526300 | 6404996 | 526330 | 6405008 | -30 | -12 | 32 | 68 | DM | (Corr'd Nav, Kongsberg 14208, img#36) (V) (T.A) |
| 19-Mar-2023 | 22:22:27 | 295 | ECR_ENV_49 | | | camera | 73 | 526295 | 6404996 | 526330 | 6405008 | -35 | -12 | 37 | 71 | DM | (Corr'd Nav, Kongsberg 14208, img#37) (V) (T.A) |
| 19-Mar-2023 | 22:22:41 | 296 | ECR_ENV_49 | | | camera | 73 | 526293 | 6404995 | 526330 | 6405008 | -36 | -13 | 39 | 70 | DM | (Corr'd Nav, Kongsberg 14208, img#38) (V) (T.A) |
| 19-Mar-2023 | 22:23:03 | 297 | ECR_ENV_49 | | | camera | 73 | 526289 | 6404995 | 526330 | 6405008 | -41 | -13 | 42 | 73 | DM | (Corr'd Nav, Kongsberg 14208, img#39) (V) (T.A) |
| 19-Mar-2023 | 22:23:19 | 298 | ECR_ENV_49 | | | camera | 73 | 526286 | 6404996 | 526330 | 6405008 | -44 | -12 | 46 | 75 | DM | (Corr'd Nav, Kongsberg 14208, img#40) (V) (T.A) |
| 19-Mar-2023 | 22:23:30 | 299 | ECR_ENV_49 | | | camera | 73 | 526285 | 6404996 | 526330 | 6405008 | -45 | -13 | 47 | 74 | DM | (Corr'd Nav, Kongsberg 14208, img#41) (V) (T.A) |
| 19-Mar-2023 | 23:31:38 | 300 | ECR_ENV_48 | | | camera | 96 | 528451 | 6406998 | 528397 | 6406983 | 54 | 15 | 56 | -106 | DM | (Corr'd Nav, Kongsberg 14208, img#42) (V) (T.A) |
| 19-Mar-2023 | 23:32:00 | 301 | ECR_ENV_48 | | | camera | 96 | 528446 | 6406998 | 528397 | 6406983 | 49 | 15 | 51 | -107 | DM | (Corr'd Nav, Kongsberg 14208, img#43) (V) (T.A) |
| 19-Mar-2023 | 23:32:11 | 302 | ECR_ENV_48 | | | camera | 96 | 528443 | 6406997 | 528397 | 6406983 | 46 | 15 | 49 | -108 | DM | (Corr'd Nav, Kongsberg 14208, img#44) (V) (T.A) |
| 19-Mar-2023 | 23:32:26 | 303 | ECR_ENV_48 | | | camera | 96 | 528440 | 6406996 | 528397 | 6406983 | 43 | 14 | 45 | -108 | DM | (Corr'd Nav, Kongsberg 14208, img#45) (V) (T.A) |
| 19-Mar-2023 | 23:32:42 | 304 | ECR_ENV_48 | | | camera | 96 | 528438 | 6406995 | 528397 | 6406983 | 41 | 13 | 43 | -107 | DM | (Corr'd Nav, Kongsberg 14208, img#46) (V) (T.A) |
| 19-Mar-2023 | 23:33:04 | 305 | ECR_ENV_48 | | | camera | 96 | 528435 | 6406993 | 528397 | 6406983 | 38 | 10 | 40 | -105 | DM | (Corr'd Nav, Kongsberg 14208, img#47) (V) (T.A) |
| 19-Mar-2023 | 23:33:17 | 306 | ECR_ENV_48 | | | camera | 96 | 528434 | 6406992 | 528397 | 6406983 | 37 | 9 | 38 | -104 | DM | (Corr'd Nav, Kongsberg 14208, img#48) (V) (T.A) |
| 19-Mar-2023 | 23:33:38 | 307 | ECR_ENV_48 | | | camera | 96 | 528430 | 6406992 | 528397 | 6406983 | 33 | 10 | 34 | -106 | DM | (Corr'd Nav, Kongsberg 14208, img#49) (V) (T.A) |
| 19-Mar-2023 | 23:33:56 | 308 | ECR_ENV_48 | | | camera | 96 | 528426 | 6406991 | 528397 | 6406983 | 29 | 9 | 31 | -107 | DM | (Corr'd Nav, Kongsberg 14208, img#50) (V) (T.A) |
| 19-Mar-2023 | 23:34:14 | 309 | ECR_ENV_48 | | | camera | 96 | 528424 | 6406990 | 528397 | 6406983 | 27 | 7 | 28 | -105 | DM | (Corr'd Nav, Kongsberg 14208, img#51) (V) (T.A) |
| 19-Mar-2023 | 23:34:26 | 310 | ECR_ENV_48 | | | camera | 96 | 528424 | 6406989 | 528397 | 6406983 | 27 | 6 | 27 | -103 | DM | (Corr'd Nav, Kongsberg 14208, img#52) (V) (T.A) |
| 19-Mar-2023 | 23:34:39 | 311 | ECR_ENV_48 | | | camera | 96 | 528424 | 6406988 | 528397 | 6406983 | 27 | 5 | 27 | -101 | DM | (Corr'd Nav, Kongsberg 14208, img#53) (V) (T.A) |
| 19-Mar-2023 | 23:35:11 | 312 | ECR_ENV_48 | | | camera | 95 | 528419 | 6406989 | 528397 | 6406983 | 22 | 6 | 23 | -105 | DM | (Corr'd Nav, Kongsberg 14208, img#54) (V) (T.A) |
| 19-Mar-2023 | 23:35:31 | 313 | ECR_ENV_48 | | | camera | 96 | 528415 | 6406986 | 528397 | 6406983 | 18 | 3 | 18 | -101 | DM | (Corr'd Nav, Kongsberg 14208, img#55) (V) (T.A) |
| 19-Mar-2023 | 23:35:46 | 314 | ECR_ENV_48 | | | camera | 95 | 528413 | 6406985 | 528397 | 6406983 | 16 | 2 | 16 | -97 | DM | (Corr'd Nav, Kongsberg 14208, img#56) (V) (T.A) |
| 19-Mar-2023 | 23:36:04 | 315 | ECR_ENV_48 | | | camera | 95 | 528409 | 6406984 | 528397 | 6406983 | 13 | 2 | 13 | -98 | DM | (Corr'd Nav, Kongsberg 14208, img#57) (V) (T.A) |
| 19-Mar-2023 | 23:36:25 | 316 | ECR_ENV_48 | | | camera | 95 | 528406 | 6406984 | 528397 | 6406983 | 9 | 1 | 9 | -97 | DM | (Corr'd Nav, Kongsberg 14208, img#58) (V) (T.A) |
| 19-Mar-2023 | 23:36:45 | 317 | ECR_ENV_48 | | | camera | 95 | 528402 | 6406984 | 528397 | 6406983 | 5 | 1 | 5 | -105 | DM | (Corr'd Nav, Kongsberg 14208, img#59) (V) (T.A) |
| 19-Mar-2023 | 23:37:01 | 318 | ECR_ENV_48 | | | camera | 95 | 528400 | 6406983 | 528397 | 6406983 | 3 | 0 | 3 | -96 | DM | (Corr'd Nav, Kongsberg 14208, img#60) (V) (T.A) |
| 19-Mar-2023 | 23:37:11 | 319 | ECR_ENV_48 | | | camera | 95 | 528399 | 6406983 | 528397 | 6406983 | 2 | 0 | 2 | -89 | DM | (Corr'd Nav, Kongsberg 14208, img#61) (V) (T.A) |
| 19-Mar-2023 | 23:37:30 | 320 | ECR_ENV_48 | | | camera | 96 | 528396 | 6406983 | 528397 | 6406983 | 0 | 0 | 0 | 126 | DM | (Corr'd Nav, Kongsberg 14208, img#62) (V) (T.A) |
| 19-Mar-2023 | 23:37:43 | 321 | ECR_ENV_48 | | | camera | 95 | 528394 | 6406984 | 528397 | 6406983 | -3 | 1 | 3 | 110 | DM | (Corr'd Nav, Kongsberg 14208, img#63) (V) (T.A) |
| 19-Mar-2023 | 23:38:03 | 322 | ECR_ENV_48 | | | camera | 95 | 528389 | 6406984 | 528397 | 6406983 | -8 | 1 | 8 | 97 | DM | (Corr'd Nav, Kongsberg 14208, img#64) (V) (T.A) |
| 19-Mar-2023 | 23:38:22 | 323 | ECR_ENV_48 | | | camera | 95 | 528386 | 6406982 | 528397 | 6406983 | -11 | -1 | 11 | 86 | DM | (Corr'd Nav, Kongsberg 14208, img#65) (V) (T.A) |
| 19-Mar-2023 | 23:38:38 | 324 | ECR_ENV_48 | | | camera | 95 | 528383 | 6406982 | 528397 | 6406983 | -14 | -1 | 14 | 86 | DM | (Corr'd Nav, Kongsberg 14208, img#66) (V) (T.A) |
| 19-Mar-2023 | 23:38:57 | 325 | ECR_ENV_48 | | | camera | 95 | 528379 | 6406982 | 528397 | 6406983 | -18 | -1 | 18 | 87 | DM | (Corr'd Nav, Kongsberg 14208, img#67) (V) (T.A) |
| 19-Mar-2023 | 23:39:06 | 326 | ECR_ENV_48 | | | camera | 95 | 528377 | 6406982 | 528397 | 6406983 | -20 | -1 | 20 | 88 | DM | (Corr'd Nav, Kongsberg 14208, img#68) (V) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 19-Mar-2023 | 23:39:24 | 327 | ECR_ENV_48 | | | camera | 95 | 528374 | 6406981 | 528397 | 6406983 | -22 | -1 | 22 | 87 | DM | (Corr'd Nav, Kongsberg 14208, img#69) (V) (T.A) |
| 19-Mar-2023 | 23:39:35 | 328 | ECR_ENV_48 | | | camera | 95 | 528373 | 6406982 | 528397 | 6406983 | -24 | -1 | 24 | 88 | DM | (Corr'd Nav, Kongsberg 14208, img#70) (V) (T.A) |
| 19-Mar-2023 | 23:39:55 | 329 | ECR_ENV_48 | | | camera | 95 | 528369 | 6406983 | 528397 | 6406983 | -28 | 1 | 28 | 91 | DM | (Corr'd Nav, Kongsberg 14208, img#71) (V) (T.A) |
| 19-Mar-2023 | 23:40:05 | 330 | ECR_ENV_48 | | | camera | 95 | 528367 | 6406983 | 528397 | 6406983 | -30 | 0 | 30 | 90 | DM | (Corr'd Nav, Kongsberg 14208, img#72) (V) (T.A) |
| 19-Mar-2023 | 23:40:19 | 331 | ECR_ENV_48 | | | camera | 95 | 528365 | 6406982 | 528397 | 6406983 | -31 | -1 | 31 | 89 | DM | (Corr'd Nav, Kongsberg 14208, img#73) (V) (T.A) |
| 19-Mar-2023 | 23:40:31 | 332 | ECR_ENV_48 | | | camera | 95 | 528363 | 6406982 | 528397 | 6406983 | -34 | 0 | 34 | 90 | DM | (Corr'd Nav, Kongsberg 14208, img#74) (V) (T.A) |
| 19-Mar-2023 | 23:40:41 | 333 | ECR_ENV_48 | | | camera | 95 | 528361 | 6406983 | 528397 | 6406983 | -36 | 0 | 36 | 90 | DM | (Corr'd Nav, Kongsberg 14208, img#75) (V) (T.A) |
| 19-Mar-2023 | 23:41:07 | 334 | ECR_ENV_48 | | | camera | 95 | 528360 | 6406982 | 528397 | 6406983 | -37 | -1 | 37 | 89 | DM | (Corr'd Nav, Kongsberg 14208, img#76) (V) (T.A) |
| 19-Mar-2023 | 23:41:28 | 335 | ECR_ENV_48 | | | camera | 95 | 528356 | 6406984 | 528397 | 6406983 | -41 | 1 | 41 | 92 | DM | (Corr'd Nav, Kongsberg 14208, img#77) (V) (T.A) |
| 19-Mar-2023 | 23:41:35 | 336 | ECR_ENV_48 | | | camera | 95 | 528354 | 6406985 | 528397 | 6406983 | -43 | 2 | 43 | 93 | DM | (Corr'd Nav, Kongsberg 14208, img#78) (V) (T.A) |
| 19-Mar-2023 | 23:42:01 | 337 | ECR_ENV_48 | | | camera | 95 | 528350 | 6406985 | 528397 | 6406983 | -47 | 3 | 47 | 93 | DM | (Corr'd Nav, Kongsberg 14208, img#79) (V) (T.A) |
| 19-Mar-2023 | 23:42:13 | 338 | ECR_ENV_48 | | | camera | 95 | 528349 | 6406985 | 528397 | 6406983 | -48 | 2 | 48 | 92 | DM | (Corr'd Nav, Kongsberg 14208, img#80) (V) (T.A) |
| 20-Mar-2023 | 01:02:50 | 339 | ECR_ENV_47 | | | camera | 87 | 525234 | 6407000 | 525217 | 6406950 | 17 | 50 | 52 | -161 | AM | (Corr'd Nav, Kongsberg 14208, img#1) (V) (T.A) |
| 20-Mar-2023 | 01:03:48 | 340 | ECR_ENV_47 | | | camera | 88 | 525235 | 6407001 | 525217 | 6406950 | 18 | 51 | 54 | -161 | AM | (Corr'd Nav, Kongsberg 14208, img#2) (V) (T.A) |
| 20-Mar-2023 | 01:03:56 | 341 | ECR_ENV_47 | | | camera | 87 | 525234 | 6407000 | 525217 | 6406950 | 17 | 50 | 53 | -161 | AM | (Corr'd Nav, Kongsberg 14208, img#3) (V) (T.A) |
| 20-Mar-2023 | 01:04:11 | 342 | ECR_ENV_47 | | | camera | 87 | 525233 | 6406998 | 525217 | 6406950 | 16 | 48 | 51 | -161 | AM | (Corr'd Nav, Kongsberg 14208, img#4) (V) (T.A) |
| 20-Mar-2023 | 01:04:46 | 343 | ECR_ENV_47 | | | camera | 87 | 525232 | 6406994 | 525217 | 6406950 | 15 | 44 | 46 | -162 | AM | (Corr'd Nav, Kongsberg 14208, img#5) (V) (T.A) |
| 20-Mar-2023 | 01:05:07 | 344 | ECR_ENV_47 | | | camera | 87 | 525231 | 6406991 | 525217 | 6406950 | 14 | 41 | 43 | -161 | AM | (Corr'd Nav, Kongsberg 14208, img#6) (V) (T.A) |
| 20-Mar-2023 | 01:05:56 | 345 | ECR_ENV_47 | | | camera | 87 | 525227 | 6406985 | 525217 | 6406950 | 11 | 35 | 36 | -163 | AM | (Corr'd Nav, Kongsberg 14208, img#7) (V) (T.A) |
| 20-Mar-2023 | 01:06:21 | 346 | ECR_ENV_47 | | | camera | 87 | 525225 | 6406983 | 525217 | 6406950 | 8 | 33 | 34 | -166 | AM | (Corr'd Nav, Kongsberg 14208, img#8) (V) (T.A) |
| 20-Mar-2023 | 01:06:51 | 347 | ECR_ENV_47 | | | camera | 87 | 525223 | 6406980 | 525217 | 6406950 | 6 | 30 | 30 | -168 | AM | (Corr'd Nav, Kongsberg 14208, img#9) (V) (T.A) |
| 20-Mar-2023 | 01:07:09 | 348 | ECR_ENV_47 | | | camera | 87 | 525222 | 6406978 | 525217 | 6406950 | 5 | 28 | 28 | -169 | AM | (Corr'd Nav, Kongsberg 14208, img#10) (V) (T.A) |
| 20-Mar-2023 | 01:07:34 | 349 | ECR_ENV_47 | | | camera | 87 | 525219 | 6406976 | 525217 | 6406950 | 3 | 26 | 26 | -174 | AM | (Corr'd Nav, Kongsberg 14208, img#11) (V) (T.A) |
| 20-Mar-2023 | 01:08:12 | 350 | ECR_ENV_47 | | | camera | 86 | 525216 | 6406972 | 525217 | 6406950 | -1 | 22 | 22 | 178 | AM | (Corr'd Nav, Kongsberg 14208, img#12) (V) (T.A) |
| 20-Mar-2023 | 01:08:23 | 351 | ECR_ENV_47 | | | camera | 86 | 525216 | 6406971 | 525217 | 6406950 | -1 | 21 | 21 | 177 | AM | (Corr'd Nav, Kongsberg 14208, img#13) (V) (T.A) |
| 20-Mar-2023 | 01:08:48 | 352 | ECR_ENV_47 | | | camera | 86 | 525216 | 6406967 | 525217 | 6406950 | -1 | 17 | 17 | 178 | AM | (Corr'd Nav, Kongsberg 14208, img#14) (V) (T.A) |
| 20-Mar-2023 | 01:08:53 | 353 | ECR_ENV_47 | | | camera | 86 | 525216 | 6406966 | 525217 | 6406950 | -1 | 16 | 16 | 178 | AM | (Corr'd Nav, Kongsberg 14208, img#15) (V) (T.A) |
| 20-Mar-2023 | 01:09:41 | 354 | ECR_ENV_47 | | | camera | 86 | 525216 | 6406959 | 525217 | 6406950 | -1 | 9 | 9 | 177 | AM | (Corr'd Nav, Kongsberg 14208, img#16) (V) (T.A) |
| 20-Mar-2023 | 01:09:56 | 355 | ECR_ENV_47 | | | camera | 86 | 525217 | 6406957 | 525217 | 6406950 | 0 | 7 | 7 | 178 | AM | (Corr'd Nav, Kongsberg 14208, img#17) (V) (T.A) |
| 20-Mar-2023 | 01:10:48 | 356 | ECR_ENV_47 | | | camera | 86 | 525214 | 6406950 | 525217 | 6406950 | -3 | 0 | 3 | 87 | AM | (Corr'd Nav, Kongsberg 14208, img#18) (V) (T.A) |
| 20-Mar-2023 | 01:11:49 | 357 | ECR_ENV_47 | | | camera | 86 | 525212 | 6406942 | 525217 | 6406950 | -5 | -8 | 9 | 31 | AM | (Corr'd Nav, Kongsberg 14208, img#19) (V) (T.A) |
| 20-Mar-2023 | 01:12:22 | 358 | ECR_ENV_47 | | | camera | 85 | 525211 | 6406937 | 525217 | 6406950 | -6 | -13 | 14 | 25 | AM | (Corr'd Nav, Kongsberg 14208, img#20) (V) (T.A) |
| 20-Mar-2023 | 01:12:35 | 359 | ECR_ENV_47 | | | camera | 85 | 525210 | 6406936 | 525217 | 6406950 | -7 | -14 | 16 | 25 | AM | (Corr'd Nav, Kongsberg 14208, img#21) (V) (T.A) |
| 20-Mar-2023 | 01:12:49 | 360 | ECR_ENV_47 | | | camera | 85 | 525210 | 6406934 | 525217 | 6406950 | -7 | -16 | 18 | 23 | AM | (Corr'd Nav, Kongsberg 14208, img#22) (V) (T.A) |
| 20-Mar-2023 | 01:13:19 | 361 | ECR_ENV_47 | | | camera | 85 | 525210 | 6406929 | 525217 | 6406950 | -7 | -21 | 22 | 19 | AM | (Corr'd Nav, Kongsberg 14208, img#23) (V) (T.A) |
| 20-Mar-2023 | 01:13:30 | 362 | ECR_ENV_47 | | | camera | 85 | 525210 | 6406927 | 525217 | 6406950 | -7 | -23 | 24 | 18 | AM | (Corr'd Nav, Kongsberg 14208, img#24) (V) (T.A) |
| 20-Mar-2023 | 01:13:41 | 363 | ECR_ENV_47 | | | camera | 85 | 525210 | 6406926 | 525217 | 6406950 | -7 | -24 | 25 | 16 | AM | (Corr'd Nav, Kongsberg 14208, img#25) (V) (T.A) |
| 20-Mar-2023 | 01:13:50 | 364 | ECR_ENV_47 | | | camera | 85 | 525210 | 6406925 | 525217 | 6406950 | -7 | -25 | 26 | 14 | AM | (Corr'd Nav, Kongsberg 14208, img#26) (V) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | | Vertical / Tidal Datum | VORF, LAT | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 20-Mar-2023 | 01:14:00 | 365 | ECR_ENV_47 | | | camera | 85 | 525211 | 6406923 | 525217 | 6406950 | -6 | -27 | 28 | 12 | AM | (Corr'd Nav, Kongsberg 14208, img#27) (V) (T.A) |
| 20-Mar-2023 | 01:14:36 | 366 | ECR_ENV_47 | | | camera | 85 | 525213 | 6406918 | 525217 | 6406950 | -4 | -32 | 32 | 7 | AM | (Corr'd Nav, Kongsberg 14208, img#28) (V) (T.A) |
| 20-Mar-2023 | 01:14:42 | 367 | ECR_ENV_47 | | | camera | 85 | 525214 | 6406917 | 525217 | 6406950 | -3 | -33 | 33 | 6 | AM | (Corr'd Nav, Kongsberg 14208, img#29) (V) (T.A) |
| 20-Mar-2023 | 01:14:49 | 368 | ECR_ENV_47 | | | camera | 85 | 525214 | 6406916 | 525217 | 6406950 | -3 | -34 | 34 | 5 | AM | (Corr'd Nav, Kongsberg 14208, img#30) (V) (T.A) |
| 20-Mar-2023 | 01:15:06 | 369 | ECR_ENV_47 | | | camera | 85 | 525216 | 6406914 | 525217 | 6406950 | -1 | -37 | 37 | 2 | AM | (Corr'd Nav, Kongsberg 14208, img#31) (V) (T.A) |
| 20-Mar-2023 | 01:15:15 | 370 | ECR_ENV_47 | | | camera | 85 | 525217 | 6406912 | 525217 | 6406950 | 0 | -38 | 38 | 1 | AM | (Corr'd Nav, Kongsberg 14208, img#32) (V) (T.A) |
| 20-Mar-2023 | 01:15:24 | 371 | ECR_ENV_47 | | | camera | 85 | 525217 | 6406911 | 525217 | 6406950 | 0 | -39 | 39 | 0 | AM | (Corr'd Nav, Kongsberg 14208, img#33) (V) (T.A) |
| 20-Mar-2023 | 01:16:00 | 372 | ECR_ENV_47 | | | camera | 85 | 525218 | 6406906 | 525217 | 6406950 | 2 | -44 | 44 | -2 | AM | (Corr'd Nav, Kongsberg 14208, img#34) (V) (T.A) |
| 20-Mar-2023 | 01:16:06 | 373 | ECR_ENV_47 | | | camera | 85 | 525218 | 6406905 | 525217 | 6406950 | 2 | -45 | 45 | -2 | AM | (Corr'd Nav, Kongsberg 14208, img#35) (V) (T.A) |
| 20-Mar-2023 | 01:16:13 | 374 | ECR_ENV_47 | | | camera | 85 | 525218 | 6406904 | 525217 | 6406950 | 1 | -46 | 46 | -2 | AM | (Corr'd Nav, Kongsberg 14208, img#36) (V) (T.A) |
| 20-Mar-2023 | 02:34:05 | 375 | ECR_ENV_46 | | | camera | 86 | 524766 | 6408974 | 524818 | 6408957 | -52 | 17 | 54 | 108 | AM | (Corr'd Nav, Kongsberg 14208, img#1) (V) (T.A) |
| 20-Mar-2023 | 02:34:18 | 376 | ECR_ENV_46 | | | camera | 86 | 524766 | 6408975 | 524818 | 6408957 | -51 | 17 | 54 | 109 | AM | (Corr'd Nav, Kongsberg 14208, img#2) (V) (T.A) |
| 20-Mar-2023 | 02:34:39 | 377 | ECR_ENV_46 | | | camera | 86 | 524767 | 6408972 | 524818 | 6408957 | -51 | 15 | 53 | 106 | AM | (Corr'd Nav, Kongsberg 14208, img#3) (V) (T.A) |
| 20-Mar-2023 | 02:34:47 | 378 | ECR_ENV_46 | | | camera | 86 | 524768 | 6408971 | 524818 | 6408957 | -50 | 14 | 52 | 105 | AM | (Corr'd Nav, Kongsberg 14208, img#4) (V) (T.A) |
| 20-Mar-2023 | 02:34:56 | 379 | ECR_ENV_46 | | | camera | 86 | 524769 | 6408970 | 524818 | 6408957 | -49 | 13 | 51 | 104 | AM | (Corr'd Nav, Kongsberg 14208, img#5) (V) (T.A) |
| 20-Mar-2023 | 02:35:15 | 380 | ECR_ENV_46 | | | camera | 86 | 524771 | 6408968 | 524818 | 6408957 | -47 | 11 | 48 | 103 | AM | (Corr'd Nav, Kongsberg 14208, img#6) (V) (T.A) |
| 20-Mar-2023 | 02:35:37 | 381 | ECR_ENV_46 | | | camera | 86 | 524773 | 6408966 | 524818 | 6408957 | -45 | 9 | 46 | 101 | AM | (Corr'd Nav, Kongsberg 14208, img#7) (V) (T.A) |
| 20-Mar-2023 | 02:35:46 | 382 | ECR_ENV_46 | | | camera | 86 | 524774 | 6408965 | 524818 | 6408957 | -44 | 7 | 44 | 100 | AM | (Corr'd Nav, Kongsberg 14208, img#8) (V) (T.A) |
| 20-Mar-2023 | 02:35:56 | 383 | ECR_ENV_46 | | | camera | 86 | 524775 | 6408964 | 524818 | 6408957 | -43 | 7 | 43 | 99 | AM | (Corr'd Nav, Kongsberg 14208, img#9) (V) (T.A) |
| 20-Mar-2023 | 02:36:16 | 384 | ECR_ENV_46 | | | camera | 86 | 524778 | 6408962 | 524818 | 6408957 | -40 | 5 | 40 | 97 | AM | (Corr'd Nav, Kongsberg 14208, img#10) (V) (T.A) |
| 20-Mar-2023 | 02:36:29 | 385 | ECR_ENV_46 | | | camera | 86 | 524780 | 6408961 | 524818 | 6408957 | -38 | 4 | 39 | 96 | AM | (Corr'd Nav, Kongsberg 14208, img#11) (V) (T.A) |
| 20-Mar-2023 | 02:36:44 | 386 | ECR_ENV_46 | | | camera | 86 | 524782 | 6408961 | 524818 | 6408957 | -36 | 4 | 36 | 96 | AM | (Corr'd Nav, Kongsberg 14208, img#12) (V) (T.A) |
| 20-Mar-2023 | 02:37:07 | 387 | ECR_ENV_46 | | | camera | 86 | 524785 | 6408960 | 524818 | 6408957 | -33 | 3 | 33 | 95 | AM | (Corr'd Nav, Kongsberg 14208, img#13) (V) (T.A) |
| 20-Mar-2023 | 02:37:14 | 388 | ECR_ENV_46 | | | camera | 86 | 524786 | 6408960 | 524818 | 6408957 | -32 | 3 | 32 | 96 | AM | (Corr'd Nav, Kongsberg 14208, img#14) (V) (T.A) |
| 20-Mar-2023 | 02:37:33 | 389 | ECR_ENV_46 | | | camera | 86 | 524789 | 6408959 | 524818 | 6408957 | -29 | 2 | 29 | 95 | AM | (Corr'd Nav, Kongsberg 14208, img#15) (V) (T.A) |
| 20-Mar-2023 | 02:37:54 | 390 | ECR_ENV_46 | | | camera | 86 | 524792 | 6408958 | 524818 | 6408957 | -26 | 1 | 26 | 91 | AM | (Corr'd Nav, Kongsberg 14208, img#16) (V) (T.A) |
| 20-Mar-2023 | 02:38:06 | 391 | ECR_ENV_46 | | | camera | 86 | 524793 | 6408957 | 524818 | 6408957 | -25 | 0 | 25 | 89 | AM | (Corr'd Nav, Kongsberg 14208, img#17) (V) (T.A) |
| 20-Mar-2023 | 02:38:18 | 392 | ECR_ENV_46 | | | camera | 86 | 524794 | 6408956 | 524818 | 6408957 | -24 | -1 | 24 | 88 | AM | (Corr'd Nav, Kongsberg 14208, img#18) (V) (T.A) |
| 20-Mar-2023 | 02:38:26 | 393 | ECR_ENV_46 | | | camera | 86 | 524795 | 6408956 | 524818 | 6408957 | -23 | -1 | 23 | 87 | AM | (Corr'd Nav, Kongsberg 14208, img#19) (V) (T.A) |
| 20-Mar-2023 | 02:38:35 | 394 | ECR_ENV_46 | | | camera | 86 | 524796 | 6408956 | 524818 | 6408957 | -22 | -2 | 22 | 86 | AM | (Corr'd Nav, Kongsberg 14208, img#20) (V) (T.A) |
| 20-Mar-2023 | 02:38:50 | 395 | ECR_ENV_46 | | | camera | 86 | 524799 | 6408955 | 524818 | 6408957 | -19 | -2 | 20 | 83 | AM | (Corr'd Nav, Kongsberg 14208, img#21) (V) (T.A) |
| 20-Mar-2023 | 02:39:07 | 396 | ECR_ENV_46 | | | camera | 86 | 524801 | 6408954 | 524818 | 6408957 | -17 | -3 | 17 | 80 | AM | (Corr'd Nav, Kongsberg 14208, img#22) (V) (T.A) |
| 20-Mar-2023 | 02:39:29 | 397 | ECR_ENV_46 | | | camera | 86 | 524804 | 6408954 | 524818 | 6408957 | -14 | -4 | 14 | 75 | AM | (Corr'd Nav, Kongsberg 14208, img#23) (V) (T.A) |
| 20-Mar-2023 | 02:39:46 | 398 | ECR_ENV_46 | | | camera | 86 | 524806 | 6408954 | 524818 | 6408957 | -12 | -4 | 12 | 73 | AM | (Corr'd Nav, Kongsberg 14208, img#24) (V) (T.A) |
| 20-Mar-2023 | 02:39:53 | 399 | ECR_ENV_46 | | | camera | 86 | 524808 | 6408954 | 524818 | 6408957 | -10 | -3 | 11 | 72 | AM | (Corr'd Nav, Kongsberg 14208, img#25) (V) (T.A) |
| 20-Mar-2023 | 02:40:34 | 400 | ECR_ENV_46 | | | camera | 86 | 524813 | 6408954 | 524818 | 6408957 | -5 | -4 | 6 | 52 | AM | (Corr'd Nav, Kongsberg 14208, img#26) (V) (T.A) |
| 20-Mar-2023 | 02:41:14 | 401 | ECR_ENV_46 | | | camera | 86 | 524819 | 6408953 | 524818 | 6408957 | 1 | -4 | 4 | -14 | AM | (Corr'd Nav, Kongsberg 14208, img#27) (V) (T.A) |
| 20-Mar-2023 | 02:41:37 | 402 | ECR_ENV_46 | | | camera | 86 | 524823 | 6408954 | 524818 | 6408957 | 5 | -3 | 5 | -59 | AM | (Corr'd Nav, Kongsberg 14208, img#28) (V) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 20-Mar-2023 | 02:42:00 | 403 | ECR_ENV_46 | | | camera | 86 | 524826 | 6408956 | 524818 | 6408957 | 8 | -2 | 9 | -79 | AM | (Corr'd Nav, Kongsberg 14208, img#29) (V) (T.A) |
| 20-Mar-2023 | 02:42:27 | 404 | ECR_ENV_46 | | | camera | 86 | 524830 | 6408957 | 524818 | 6408957 | 12 | 0 | 12 | -91 | AM | (Corr'd Nav, Kongsberg 14208, img#30) (V) (T.A) |
| 20-Mar-2023 | 02:42:40 | 405 | ECR_ENV_46 | | | camera | 86 | 524831 | 6408956 | 524818 | 6408957 | 13 | -1 | 13 | -84 | AM | (Corr'd Nav, Kongsberg 14208, img#31) (V) (T.A) |
| 20-Mar-2023 | 02:43:26 | 406 | ECR_ENV_46 | | | camera | 86 | 524837 | 6408955 | 524818 | 6408957 | 19 | -2 | 19 | -83 | AM | (Corr'd Nav, Kongsberg 14208, img#32) (V) (T.A) |
| 20-Mar-2023 | 02:43:50 | 407 | ECR_ENV_46 | | | camera | 86 | 524841 | 6408956 | 524818 | 6408957 | 23 | -1 | 23 | -87 | AM | (Corr'd Nav, Kongsberg 14208, img#33) (V) (T.A) |
| 20-Mar-2023 | 02:44:10 | 408 | ECR_ENV_46 | | | camera | 86 | 524842 | 6408957 | 524818 | 6408957 | 25 | 0 | 24 | -89 | AM | (Corr'd Nav, Kongsberg 14208, img#34) (V) (T.A) |
| 20-Mar-2023 | 02:44:29 | 409 | ECR_ENV_46 | | | camera | 86 | 524845 | 6408957 | 524818 | 6408957 | 27 | -1 | 27 | -89 | AM | (Corr'd Nav, Kongsberg 14208, img#35) (V) (T.A) |
| 20-Mar-2023 | 02:44:38 | 410 | ECR_ENV_46 | | | camera | 86 | 524846 | 6408957 | 524818 | 6408957 | 29 | -1 | 28 | -89 | AM | (Corr'd Nav, Kongsberg 14208, img#36) (V) (T.A) |
| 20-Mar-2023 | 02:44:59 | 411 | ECR_ENV_46 | | | camera | 86 | 524849 | 6408957 | 524818 | 6408957 | 31 | 0 | 31 | -90 | AM | (Corr'd Nav, Kongsberg 14208, img#37) (V) (T.A) |
| 20-Mar-2023 | 02:45:09 | 412 | ECR_ENV_46 | | | camera | 86 | 524851 | 6408957 | 524818 | 6408957 | 33 | 0 | 33 | -89 | AM | (Corr'd Nav, Kongsberg 14208, img#38) (V) (T.A) |
| 20-Mar-2023 | 02:45:25 | 413 | ECR_ENV_46 | | | camera | 86 | 524853 | 6408957 | 524818 | 6408957 | 35 | -1 | 35 | -89 | AM | (Corr'd Nav, Kongsberg 14208, img#39) (V) (T.A) |
| 20-Mar-2023 | 02:45:39 | 414 | ECR_ENV_46 | | | camera | 86 | 524854 | 6408957 | 524818 | 6408957 | 36 | 0 | 36 | -89 | AM | (Corr'd Nav, Kongsberg 14208, img#40) (V) (T.A) |
| 20-Mar-2023 | 02:45:48 | 415 | ECR_ENV_46 | | | camera | 86 | 524856 | 6408957 | 524818 | 6408957 | 38 | 0 | 38 | -90 | AM | (Corr'd Nav, Kongsberg 14208, img#41) (V) (T.A) |
| 20-Mar-2023 | 02:45:56 | 416 | ECR_ENV_46 | | | camera | 86 | 524857 | 6408957 | 524818 | 6408957 | 39 | 0 | 39 | -89 | AM | (Corr'd Nav, Kongsberg 14208, img#42) (V) (T.A) |
| 20-Mar-2023 | 02:46:18 | 417 | ECR_ENV_46 | | | camera | 86 | 524860 | 6408956 | 524818 | 6408957 | 42 | -2 | 42 | -88 | AM | (Corr'd Nav, Kongsberg 14208, img#43) (V) (T.A) |
| 20-Mar-2023 | 02:46:25 | 418 | ECR_ENV_46 | | | camera | 86 | 524861 | 6408955 | 524818 | 6408957 | 43 | -2 | 43 | -88 | AM | (Corr'd Nav, Kongsberg 14208, img#44) (V) (T.A) |
| 20-Mar-2023 | 02:46:42 | 419 | ECR_ENV_46 | | | camera | 86 | 524862 | 6408956 | 524818 | 6408957 | 44 | -2 | 44 | -88 | AM | (Corr'd Nav, Kongsberg 14208, img#45) (V) (T.A) |
| 20-Mar-2023 | 02:46:54 | 420 | ECR_ENV_46 | | | camera | 86 | 524864 | 6408955 | 524818 | 6408957 | 46 | -2 | 46 | -88 | AM | (Corr'd Nav, Kongsberg 14208, img#46) (V) (T.A) |
| 20-Mar-2023 | 02:47:10 | 421 | ECR_ENV_46 | | | camera | 86 | 524866 | 6408955 | 524818 | 6408957 | 48 | -2 | 48 | -88 | AM | (Corr'd Nav, Kongsberg 14208, img#47) (V) (T.A) |
| 20-Mar-2023 | 02:47:29 | 422 | ECR_ENV_46 | | | camera | 86 | 524868 | 6408955 | 524818 | 6408957 | 50 | -2 | 50 | -88 | AM | (Corr'd Nav, Kongsberg 14208, img#48) (V) (T.A) |
| 20-Mar-2023 | 04:05:56 | 423 | ECR_ENV_45 | | | camera | 83 | 527473 | 6410078 | 527524 | 6410067 | -51 | 11 | 52 | 103 | AM | (Corr'd Nav, Kongsberg 14208, img#1) (V) (T.A) |
| 20-Mar-2023 | 04:06:41 | 424 | ECR_ENV_45 | | | camera | 83 | 527468 | 6410080 | 527524 | 6410067 | -55 | 13 | 57 | 103 | AM | (Corr'd Nav, Kongsberg 14208, img#2) (V) (T.A) |
| 20-Mar-2023 | 04:06:48 | 425 | ECR_ENV_45 | | | camera | 83 | 527467 | 6410080 | 527524 | 6410067 | -56 | 13 | 58 | 103 | AM | (Corr'd Nav, Kongsberg 14208, img#3) (V) (T.A) |
| 20-Mar-2023 | 04:07:03 | 426 | ECR_ENV_45 | | | camera | 83 | 527465 | 6410080 | 527524 | 6410067 | -59 | 13 | 60 | 103 | AM | (Corr'd Nav, Kongsberg 14208, img#4) (V) (T.A) |
| 20-Mar-2023 | 04:07:21 | 427 | ECR_ENV_45 | | | camera | 83 | 527464 | 6410079 | 527524 | 6410067 | -60 | 12 | 61 | 102 | AM | (Corr'd Nav, Kongsberg 14208, img#5) (V) (T.A) |
| 20-Mar-2023 | 04:07:35 | 428 | ECR_ENV_45 | | | camera | 83 | 527465 | 6410078 | 527524 | 6410067 | -58 | 12 | 60 | 101 | AM | (Corr'd Nav, Kongsberg 14208, img#6) (V) (T.A) |
| 20-Mar-2023 | 04:08:14 | 429 | ECR_ENV_45 | | | camera | 83 | 527469 | 6410075 | 527524 | 6410067 | -54 | 8 | 55 | 98 | AM | (Corr'd Nav, Kongsberg 14208, img#7) (V) (T.A) |
| 20-Mar-2023 | 04:08:24 | 430 | ECR_ENV_45 | | | camera | 83 | 527471 | 6410074 | 527524 | 6410067 | -53 | 7 | 53 | 98 | AM | (Corr'd Nav, Kongsberg 14208, img#8) (V) (T.A) |
| 20-Mar-2023 | 04:09:18 | 431 | ECR_ENV_45 | | | camera | 83 | 527481 | 6410074 | 527524 | 6410067 | -42 | 7 | 43 | 100 | AM | (Corr'd Nav, Kongsberg 14208, img#9) (V) (T.A) |
| 20-Mar-2023 | 04:09:51 | 432 | ECR_ENV_45 | | | camera | 83 | 527485 | 6410072 | 527524 | 6410067 | -39 | 5 | 39 | 97 | AM | (Corr'd Nav, Kongsberg 14208, img#10) (V) (T.A) |
| 20-Mar-2023 | 04:10:40 | 433 | ECR_ENV_45 | | | camera | 83 | 527493 | 6410069 | 527524 | 6410067 | -31 | 2 | 31 | 94 | AM | (Corr'd Nav, Kongsberg 14208, img#11) (V) (T.A) |
| 20-Mar-2023 | 04:11:09 | 434 | ECR_ENV_45 | | | camera | 83 | 527497 | 6410070 | 527524 | 6410067 | -26 | 3 | 26 | 96 | AM | (Corr'd Nav, Kongsberg 14208, img#12) (V) (T.A) |
| 20-Mar-2023 | 04:11:26 | 435 | ECR_ENV_45 | | | camera | 83 | 527500 | 6410068 | 527524 | 6410067 | -24 | 1 | 24 | 93 | AM | (Corr'd Nav, Kongsberg 14208, img#13) (V) (T.A) |
| 20-Mar-2023 | 04:12:05 | 436 | ECR_ENV_45 | | | camera | 83 | 527506 | 6410067 | 527524 | 6410067 | -18 | 0 | 18 | 91 | AM | (Corr'd Nav, Kongsberg 14208, img#14) (V) (T.A) |
| 20-Mar-2023 | 04:12:36 | 437 | ECR_ENV_45 | | | camera | 83 | 527510 | 6410068 | 527524 | 6410067 | -13 | 1 | 13 | 96 | AM | (Corr'd Nav, Kongsberg 14208, img#15) (V) (T.A) |
| 20-Mar-2023 | 04:12:45 | 438 | ECR_ENV_45 | | | camera | 83 | 527512 | 6410068 | 527524 | 6410067 | -12 | 2 | 12 | 98 | AM | (Corr'd Nav, Kongsberg 14208, img#16) (V) (T.A) |
| 20-Mar-2023 | 04:13:11 | 439 | ECR_ENV_45 | | | camera | 83 | 527516 | 6410069 | 527524 | 6410067 | -8 | 2 | 8 | 106 | AM | (Corr'd Nav, Kongsberg 14208, img#17) (V) (T.A) |
| 20-Mar-2023 | 04:14:03 | 440 | ECR_ENV_45 | | | camera | 83 | 527523 | 6410067 | 527524 | 6410067 | 0 | 0 | 1 | 134 | AM | (Corr'd Nav, Kongsberg 14208, img#18) (V) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 20-Mar-2023 | 04:14:10 | 441 | ECR_ENV_45 | | | camera | 83 | 527525 | 6410067 | 527524 | 6410067 | 1 | 0 | 1 | -89 | AM | (Corr'd Nav, Kongsberg 14208, img#19) (V) (T.A) |
| 20-Mar-2023 | 04:14:26 | 442 | ECR_ENV_45 | | | camera | 83 | 527526 | 6410067 | 527524 | 6410067 | 3 | 0 | 3 | -90 | AM | (Corr'd Nav, Kongsberg 14208, img#20) (V) (T.A) |
| 20-Mar-2023 | 04:15:34 | 443 | ECR_ENV_45 | | | camera | 83 | 527537 | 6410065 | 527524 | 6410067 | 13 | -2 | 13 | -81 | AM | (Corr'd Nav, Kongsberg 14208, img#21) (V) (T.A) |
| 20-Mar-2023 | 04:16:01 | 444 | ECR_ENV_45 | | | camera | 83 | 527540 | 6410066 | 527524 | 6410067 | 16 | -1 | 16 | -87 | AM | (Corr'd Nav, Kongsberg 14208, img#22) (V) (T.A) |
| 20-Mar-2023 | 04:16:13 | 445 | ECR_ENV_45 | | | camera | 83 | 527542 | 6410066 | 527524 | 6410067 | 18 | -1 | 18 | -87 | AM | (Corr'd Nav, Kongsberg 14208, img#23) (V) (T.A) |
| 20-Mar-2023 | 04:16:58 | 446 | ECR_ENV_45 | | | camera | 83 | 527548 | 6410064 | 527524 | 6410067 | 24 | -2 | 24 | -84 | AM | (Corr'd Nav, Kongsberg 14208, img#24) (V) (T.A) |
| 20-Mar-2023 | 04:17:27 | 447 | ECR_ENV_45 | | | camera | 83 | 527552 | 6410064 | 527524 | 6410067 | 29 | -2 | 29 | -85 | AM | (Corr'd Nav, Kongsberg 14208, img#25) (V) (T.A) |
| 20-Mar-2023 | 04:17:34 | 448 | ECR_ENV_45 | | | camera | 83 | 527553 | 6410064 | 527524 | 6410067 | 30 | -2 | 30 | -85 | AM | (Corr'd Nav, Kongsberg 14208, img#26) (V) (T.A) |
| 20-Mar-2023 | 04:17:50 | 449 | ECR_ENV_45 | | | camera | 83 | 527555 | 6410065 | 527524 | 6410067 | 32 | -2 | 32 | -87 | AM | (Corr'd Nav, Kongsberg 14208, img#27) (V) (T.A) |
| 20-Mar-2023 | 04:18:16 | 450 | ECR_ENV_45 | | | camera | 83 | 527559 | 6410065 | 527524 | 6410067 | 35 | -1 | 35 | -88 | AM | (Corr'd Nav, Kongsberg 14208, img#28) (V) (T.A) |
| 20-Mar-2023 | 04:18:25 | 451 | ECR_ENV_45 | | | camera | 83 | 527560 | 6410065 | 527524 | 6410067 | 37 | -2 | 37 | -88 | AM | (Corr'd Nav, Kongsberg 14208, img#29) (V) (T.A) |
| 20-Mar-2023 | 04:18:42 | 452 | ECR_ENV_45 | | | camera | 83 | 527561 | 6410065 | 527524 | 6410067 | 38 | -1 | 38 | -88 | AM | (Corr'd Nav, Kongsberg 14208, img#30) (V) (T.A) |
| 20-Mar-2023 | 04:18:49 | 453 | ECR_ENV_45 | | | camera | 83 | 527562 | 6410066 | 527524 | 6410067 | 38 | -1 | 38 | -88 | AM | (Corr'd Nav, Kongsberg 14208, img#31) (V) (T.A) |
| 20-Mar-2023 | 04:18:59 | 454 | ECR_ENV_45 | | | camera | 83 | 527563 | 6410065 | 527524 | 6410067 | 39 | -2 | 39 | -88 | AM | (Corr'd Nav, Kongsberg 14208, img#32) (V) (T.A) |
| 20-Mar-2023 | 04:19:16 | 455 | ECR_ENV_45 | | | camera | 83 | 527565 | 6410063 | 527524 | 6410067 | 42 | -4 | 42 | -84 | AM | (Corr'd Nav, Kongsberg 14208, img#33) (V) (T.A) |
| 20-Mar-2023 | 04:19:25 | 456 | ECR_ENV_45 | | | camera | 83 | 527566 | 6410062 | 527524 | 6410067 | 43 | -5 | 43 | -84 | AM | (Corr'd Nav, Kongsberg 14208, img#34) (V) (T.A) |
| 20-Mar-2023 | 04:19:30 | 457 | ECR_ENV_45 | | | camera | 83 | 527567 | 6410062 | 527524 | 6410067 | 43 | -5 | 43 | -84 | AM | (Corr'd Nav, Kongsberg 14208, img#35) (V) (T.A) |
| 20-Mar-2023 | 04:19:42 | 458 | ECR_ENV_45 | | | camera | 83 | 527568 | 6410062 | 527524 | 6410067 | 45 | -5 | 45 | -84 | AM | (Corr'd Nav, Kongsberg 14208, img#36) (V) (T.A) |
| 20-Mar-2023 | 04:20:02 | 459 | ECR_ENV_45 | | | camera | 83 | 527572 | 6410061 | 527524 | 6410067 | 49 | -5 | 49 | -84 | AM | (Corr'd Nav, Kongsberg 14208, img#37) (V) (T.A) |
| 20-Mar-2023 | 04:20:14 | 460 | ECR_ENV_45 | | | camera | 83 | 527574 | 6410062 | 527524 | 6410067 | 50 | -5 | 51 | -84 | AM | (Corr'd Nav, Kongsberg 14208, img#38) (V) (T.A) |
| 20-Mar-2023 | 05:32:20 | 461 | ECR_ENV_44 | | | camera | 77 | 525521 | 6411506 | 525589 | 6411512 | -67 | -6 | 67 | 85 | AM | (Corr'd Nav, Kongsberg 14208, img#1) (V) (T.A) |
| 20-Mar-2023 | 05:33:59 | 462 | ECR_ENV_44 | | | camera | 77 | 525531 | 6411506 | 525589 | 6411512 | -57 | -6 | 58 | 84 | AM | (Corr'd Nav, Kongsberg 14208, img#2) (V) (T.A) |
| 20-Mar-2023 | 05:34:13 | 463 | ECR_ENV_44 | | | camera | 77 | 525532 | 6411508 | 525589 | 6411512 | -56 | -4 | 56 | 86 | AM | (Corr'd Nav, Kongsberg 14208, img#3) (V) (T.A) |
| 20-Mar-2023 | 05:34:36 | 464 | ECR_ENV_44 | | | camera | 77 | 525537 | 6411511 | 525589 | 6411512 | -52 | -2 | 52 | 88 | AM | (Corr'd Nav, Kongsberg 14208, img#4) (V) (T.A) |
| 20-Mar-2023 | 05:34:57 | 465 | ECR_ENV_44 | | | camera | 77 | 525539 | 6411513 | 525589 | 6411512 | -50 | 1 | 50 | 91 | AM | (Corr'd Nav, Kongsberg 14208, img#5) (V) (T.A) |
| 20-Mar-2023 | 05:35:06 | 466 | ECR_ENV_44 | | | camera | 77 | 525540 | 6411513 | 525589 | 6411512 | -49 | 0 | 49 | 90 | AM | (Corr'd Nav, Kongsberg 14208, img#6) (V) (T.A) |
| 20-Mar-2023 | 05:35:27 | 467 | ECR_ENV_44 | | | camera | 77 | 525542 | 6411509 | 525589 | 6411512 | -47 | -3 | 47 | 86 | AM | (Corr'd Nav, Kongsberg 14208, img#7) (V) (T.A) |
| 20-Mar-2023 | 05:36:01 | 468 | ECR_ENV_44 | | | camera | 77 | 525545 | 6411508 | 525589 | 6411512 | -43 | -5 | 44 | 84 | AM | (Corr'd Nav, Kongsberg 14208, img#8) (V) (T.A) |
| 20-Mar-2023 | 05:36:23 | 469 | ECR_ENV_44 | | | camera | 77 | 525549 | 6411506 | 525589 | 6411512 | -40 | -6 | 40 | 81 | AM | (Corr'd Nav, Kongsberg 14208, img#9) (V) (T.A) |
| 20-Mar-2023 | 05:36:54 | 470 | ECR_ENV_44 | | | camera | 77 | 525551 | 6411507 | 525589 | 6411512 | -38 | -6 | 38 | 81 | AM | (Corr'd Nav, Kongsberg 14208, img#10) (V) (T.A) |
| 20-Mar-2023 | 05:37:05 | 471 | ECR_ENV_44 | | | camera | 77 | 525552 | 6411507 | 525589 | 6411512 | -36 | -5 | 37 | 82 | AM | (Corr'd Nav, Kongsberg 14208, img#11) (V) (T.A) |
| 20-Mar-2023 | 05:37:13 | 472 | ECR_ENV_44 | | | camera | 77 | 525554 | 6411508 | 525589 | 6411512 | -35 | -5 | 35 | 82 | AM | (Corr'd Nav, Kongsberg 14208, img#12) (V) (T.A) |
| 20-Mar-2023 | 05:37:27 | 473 | ECR_ENV_44 | | | camera | 77 | 525556 | 6411508 | 525589 | 6411512 | -32 | -4 | 33 | 82 | AM | (Corr'd Nav, Kongsberg 14208, img#13) (V) (T.A) |
| 20-Mar-2023 | 05:37:57 | 474 | ECR_ENV_44 | | | camera | 77 | 525560 | 6411508 | 525589 | 6411512 | -29 | -5 | 29 | 80 | AM | (Corr'd Nav, Kongsberg 14208, img#14) (V) (T.A) |
| 20-Mar-2023 | 05:38:10 | 475 | ECR_ENV_44 | | | camera | 77 | 525562 | 6411507 | 525589 | 6411512 | -27 | -5 | 27 | 79 | AM | (Corr'd Nav, Kongsberg 14208, img#15) (V) (T.A) |
| 20-Mar-2023 | 05:38:39 | 476 | ECR_ENV_44 | | | camera | 77 | 525566 | 6411508 | 525589 | 6411512 | -22 | -4 | 23 | 79 | AM | (Corr'd Nav, Kongsberg 14208, img#16) (V) (T.A) |
| 20-Mar-2023 | 05:38:57 | 477 | ECR_ENV_44 | | | camera | 77 | 525569 | 6411510 | 525589 | 6411512 | -20 | -3 | 20 | 82 | AM | (Corr'd Nav, Kongsberg 14208, img#17) (V) (T.A) |
| 20-Mar-2023 | 05:39:26 | 478 | ECR_ENV_44 | | | camera | 77 | 525572 | 6411511 | 525589 | 6411512 | -16 | -1 | 16 | 86 | AM | (Corr'd Nav, Kongsberg 14208, img#18) (V) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 20-Mar-2023 | 05:39:50 | 479 | ECR_ENV_44 | | | camera | 77 | 525575 | 6411511 | 525589 | 6411512 | -14 | -1 | 14 | 86 | AM | (Corr'd Nav, Kongsberg 14208, img#19) (V) (T.A) |
| 20-Mar-2023 | 05:40:42 | 480 | ECR_ENV_44 | | | camera | 77 | 525581 | 6411516 | 525589 | 6411512 | -7 | 4 | 8 | 118 | AM | (Corr'd Nav, Kongsberg 14208, img#20) (V) (T.A) |
| 20-Mar-2023 | 05:41:11 | 481 | ECR_ENV_44 | | | camera | 77 | 525585 | 6411512 | 525589 | 6411512 | -4 | 0 | 4 | 84 | AM | (Corr'd Nav, Kongsberg 14208, img#21) (V) (T.A) |
| 20-Mar-2023 | 05:41:29 | 482 | ECR_ENV_44 | | | camera | 77 | 525587 | 6411511 | 525589 | 6411512 | -2 | -1 | 2 | 56 | AM | (Corr'd Nav, Kongsberg 14208, img#22) (V) (T.A) |
| 20-Mar-2023 | 05:42:50 | 483 | ECR_ENV_44 | | | camera | 77 | 525598 | 6411510 | 525589 | 6411512 | 10 | -2 | 10 | -77 | AM | (Corr'd Nav, Kongsberg 14208, img#23) (V) (T.A) |
| 20-Mar-2023 | 05:42:58 | 484 | ECR_ENV_44 | | | camera | 77 | 525601 | 6411511 | 525589 | 6411512 | 12 | -2 | 12 | -81 | AM | (Corr'd Nav, Kongsberg 14208, img#24) (V) (T.A) |
| 20-Mar-2023 | 05:43:07 | 485 | ECR_ENV_44 | | | camera | 77 | 525603 | 6411511 | 525589 | 6411512 | 14 | -2 | 14 | -83 | AM | (Corr'd Nav, Kongsberg 14208, img#25) (V) (T.A) |
| 20-Mar-2023 | 05:43:25 | 486 | ECR_ENV_44 | | | camera | 77 | 525605 | 6411511 | 525589 | 6411512 | 17 | -1 | 17 | -86 | AM | (Corr'd Nav, Kongsberg 14208, img#26) (V) (T.A) |
| 20-Mar-2023 | 05:43:36 | 487 | ECR_ENV_44 | | | camera | 77 | 525606 | 6411512 | 525589 | 6411512 | 18 | 0 | 18 | -89 | AM | (Corr'd Nav, Kongsberg 14208, img#27) (V) (T.A) |
| 20-Mar-2023 | 05:43:47 | 488 | ECR_ENV_44 | | | camera | 77 | 525608 | 6411513 | 525589 | 6411512 | 20 | 0 | 20 | -91 | AM | (Corr'd Nav, Kongsberg 14208, img#28) (V) (T.A) |
| 20-Mar-2023 | 05:44:18 | 489 | ECR_ENV_44 | | | camera | 77 | 525615 | 6411515 | 525589 | 6411512 | 27 | 3 | 27 | -96 | AM | (Corr'd Nav, Kongsberg 14208, img#29) (V) (T.A) |
| 20-Mar-2023 | 05:44:40 | 490 | ECR_ENV_44 | | | camera | 78 | 525617 | 6411513 | 525589 | 6411512 | 29 | 1 | 29 | -91 | AM | (Corr'd Nav, Kongsberg 14208, img#30) (V) (T.A) |
| 20-Mar-2023 | 05:44:46 | 491 | ECR_ENV_44 | | | camera | 77 | 525617 | 6411513 | 525589 | 6411512 | 29 | 0 | 29 | -90 | AM | (Corr'd Nav, Kongsberg 14208, img#31) (V) (T.A) |
| 20-Mar-2023 | 05:45:03 | 492 | ECR_ENV_44 | | | camera | 77 | 525619 | 6411512 | 525589 | 6411512 | 30 | -1 | 30 | -89 | AM | (Corr'd Nav, Kongsberg 14208, img#32) (V) (T.A) |
| 20-Mar-2023 | 05:45:22 | 493 | ECR_ENV_44 | | | camera | 78 | 525623 | 6411511 | 525589 | 6411512 | 34 | -1 | 34 | -88 | AM | (Corr'd Nav, Kongsberg 14208, img#33) (V) (T.A) |
| 20-Mar-2023 | 05:45:42 | 494 | ECR_ENV_44 | | | camera | 77 | 525625 | 6411512 | 525589 | 6411512 | 36 | -1 | 36 | -89 | AM | (Corr'd Nav, Kongsberg 14208, img#34) (V) (T.A) |
| 20-Mar-2023 | 05:45:50 | 495 | ECR_ENV_44 | | | camera | 77 | 525625 | 6411512 | 525589 | 6411512 | 36 | 0 | 36 | -89 | AM | (Corr'd Nav, Kongsberg 14208, img#35) (V) (T.A) |
| 20-Mar-2023 | 05:46:08 | 496 | ECR_ENV_44 | | | camera | 77 | 525627 | 6411513 | 525589 | 6411512 | 38 | 0 | 38 | -91 | AM | (Corr'd Nav, Kongsberg 14208, img#36) (V) (T.A) |
| 20-Mar-2023 | 05:46:28 | 497 | ECR_ENV_44 | | | camera | 77 | 525630 | 6411515 | 525589 | 6411512 | 42 | 2 | 42 | -93 | AM | (Corr'd Nav, Kongsberg 14208, img#37) (V) (T.A) |
| 20-Mar-2023 | 05:46:56 | 498 | ECR_ENV_44 | | | camera | 78 | 525634 | 6411515 | 525589 | 6411512 | 46 | 2 | 46 | -93 | AM | (Corr'd Nav, Kongsberg 14208, img#38) (V) (T.A) |
| 20-Mar-2023 | 05:47:12 | 499 | ECR_ENV_44 | | | camera | 78 | 525635 | 6411514 | 525589 | 6411512 | 47 | 2 | 47 | -92 | AM | (Corr'd Nav, Kongsberg 14208, img#39) (V) (T.A) |
| 20-Mar-2023 | 05:47:41 | 500 | ECR_ENV_44 | | | camera | 78 | 525640 | 6411514 | 525589 | 6411512 | 51 | 2 | 51 | -92 | AM | (Corr'd Nav, Kongsberg 14208, img#40) (V) (T.A) |
| 20-Mar-2023 | 07:32:40 | 501 | ECR_ENV_43 | | | camera | 64 | 526881 | 6417289 | 526959 | 6417301 | -78 | -12 | 78 | 81 | AM | (Corr'd Nav, Kongsberg 14208, img#1) (B) (T.A) |
| 20-Mar-2023 | 07:33:42 | 502 | ECR_ENV_43 | | | camera | 64 | 526885 | 6417296 | 526959 | 6417301 | -74 | -5 | 74 | 86 | AM | (Corr'd Nav, Kongsberg 14208, img#2) (B) (T.A) |
| 20-Mar-2023 | 07:34:08 | 503 | ECR_ENV_43 | | | camera | 64 | 526888 | 6417297 | 526959 | 6417301 | -70 | -5 | 70 | 86 | AM | (Corr'd Nav, Kongsberg 14208, img#3) (B) (T.A) |
| 20-Mar-2023 | 07:34:26 | 504 | ECR_ENV_43 | | | camera | 64 | 526890 | 6417295 | 526959 | 6417301 | -68 | -6 | 68 | 85 | AM | (Corr'd Nav, Kongsberg 14208, img#4) (B) (T.A) |
| 20-Mar-2023 | 07:34:36 | 505 | ECR_ENV_43 | | | camera | 64 | 526891 | 6417293 | 526959 | 6417301 | -68 | -8 | 68 | 83 | AM | (Corr'd Nav, Kongsberg 14208, img#5) (B) (T.A) |
| 20-Mar-2023 | 07:34:56 | 506 | ECR_ENV_43 | | | camera | 64 | 526894 | 6417294 | 526959 | 6417301 | -64 | -7 | 65 | 84 | AM | (Corr'd Nav, Kongsberg 14208, img#6) (B) (T.A) |
| 20-Mar-2023 | 07:35:05 | 507 | ECR_ENV_43 | | | camera | 64 | 526894 | 6417294 | 526959 | 6417301 | -64 | -8 | 65 | 83 | AM | (Corr'd Nav, Kongsberg 14208, img#7) (B) (T.A) |
| 20-Mar-2023 | 07:35:12 | 508 | ECR_ENV_43 | | | camera | 64 | 526896 | 6417293 | 526959 | 6417301 | -63 | -8 | 63 | 83 | AM | (Corr'd Nav, Kongsberg 14208, img#8) (B) (T.A) |
| 20-Mar-2023 | 07:35:35 | 509 | ECR_ENV_43 | | | camera | 64 | 526898 | 6417291 | 526959 | 6417301 | -61 | -10 | 62 | 81 | AM | (Corr'd Nav, Kongsberg 14208, img#9) (B) (T.A) |
| 20-Mar-2023 | 07:36:01 | 510 | ECR_ENV_43 | | | camera | 64 | 526900 | 6417292 | 526959 | 6417301 | -59 | -9 | 59 | 81 | AM | (Corr'd Nav, Kongsberg 14208, img#10) (B) (T.A) |
| 20-Mar-2023 | 07:36:08 | 511 | ECR_ENV_43 | | | camera | 64 | 526902 | 6417293 | 526959 | 6417301 | -57 | -8 | 57 | 82 | AM | (Corr'd Nav, Kongsberg 14208, img#11) (B) (T.A) |
| 20-Mar-2023 | 07:36:16 | 512 | ECR_ENV_43 | | | camera | 64 | 526903 | 6417293 | 526959 | 6417301 | -56 | -8 | 57 | 82 | AM | (Corr'd Nav, Kongsberg 14208, img#12) (B) (T.A) |
| 20-Mar-2023 | 07:36:29 | 513 | ECR_ENV_43 | | | camera | 64 | 526905 | 6417293 | 526959 | 6417301 | -54 | -8 | 54 | 81 | AM | (Corr'd Nav, Kongsberg 14208, img#13) (B) (T.A) |
| 20-Mar-2023 | 07:36:50 | 514 | ECR_ENV_43 | | | camera | 64 | 526907 | 6417295 | 526959 | 6417301 | -51 | -7 | 52 | 83 | AM | (Corr'd Nav, Kongsberg 14208, img#14) (B) (T.A) |
| 20-Mar-2023 | 07:37:18 | 515 | ECR_ENV_43 | | | camera | 64 | 526911 | 6417292 | 526959 | 6417301 | -47 | -9 | 48 | 80 | AM | (Corr'd Nav, Kongsberg 14208, img#15) (B) (T.A) |
| 20-Mar-2023 | 07:37:29 | 516 | ECR_ENV_43 | | | camera | 64 | 526913 | 6417292 | 526959 | 6417301 | -46 | -10 | 47 | 78 | AM | (Corr'd Nav, Kongsberg 14208, img#16) (B) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 20-Mar-2023 | 07:37:42 | 517 | ECR_ENV_43 | | | camera | 64 | 526914 | 6417292 | 526959 | 6417301 | -44 | -9 | 45 | 78 | AM | (Corr'd Nav, Kongsberg 14208, img#17) (B) (T.A) |
| 20-Mar-2023 | 07:37:59 | 518 | ECR_ENV_43 | | | camera | 64 | 526917 | 6417292 | 526959 | 6417301 | -41 | -9 | 42 | 77 | AM | (Corr'd Nav, Kongsberg 14208, img#18) (B) (T.A) |
| 20-Mar-2023 | 07:38:11 | 519 | ECR_ENV_43 | | | camera | 64 | 526919 | 6417292 | 526959 | 6417301 | -39 | -9 | 40 | 77 | AM | (Corr'd Nav, Kongsberg 14208, img#19) (B) (T.A) |
| 20-Mar-2023 | 07:38:18 | 520 | ECR_ENV_43 | | | camera | 64 | 526921 | 6417292 | 526959 | 6417301 | -38 | -9 | 39 | 77 | AM | (Corr'd Nav, Kongsberg 14208, img#20) (B) (T.A) |
| 20-Mar-2023 | 07:38:30 | 521 | ECR_ENV_43 | | | camera | 64 | 526922 | 6417292 | 526959 | 6417301 | -36 | -9 | 37 | 76 | AM | (Corr'd Nav, Kongsberg 14208, img#21) (B) (T.A) |
| 20-Mar-2023 | 07:38:58 | 522 | ECR_ENV_43 | | | camera | 64 | 526926 | 6417294 | 526959 | 6417301 | -32 | -7 | 33 | 77 | AM | (Corr'd Nav, Kongsberg 14208, img#22) (B) (T.A) |
| 20-Mar-2023 | 07:39:05 | 523 | ECR_ENV_43 | | | camera | 65 | 526927 | 6417293 | 526959 | 6417301 | -32 | -8 | 33 | 76 | AM | (Raw Nav, Kongsberg 14208, img#23) (B) |
| 20-Mar-2023 | 07:39:20 | 524 | ECR_ENV_43 | | | camera | 65 | 526929 | 6417294 | 526959 | 6417301 | -30 | -7 | 30 | 76 | AM | (Raw Nav, Kongsberg 14208, img#24) (B) |
| 20-Mar-2023 | 07:39:25 | 525 | ECR_ENV_43 | | | camera | 64 | 526930 | 6417293 | 526959 | 6417301 | -28 | -8 | 29 | 74 | AM | (Corr'd Nav, Kongsberg 14208, img#25) (B) (T.A) |
| 20-Mar-2023 | 07:39:52 | 526 | ECR_ENV_43 | | | camera | 64 | 526934 | 6417295 | 526959 | 6417301 | -24 | -6 | 25 | 75 | AM | (Corr'd Nav, Kongsberg 14208, img#26) (B) (T.A) |
| 20-Mar-2023 | 07:39:58 | 527 | ECR_ENV_43 | | | camera | 64 | 526935 | 6417294 | 526959 | 6417301 | -24 | -7 | 25 | 74 | AM | (Corr'd Nav, Kongsberg 14208, img#27) (B) (T.A) |
| 20-Mar-2023 | 07:40:06 | 528 | ECR_ENV_43 | | | camera | 64 | 526936 | 6417296 | 526959 | 6417301 | -23 | -6 | 24 | 76 | AM | (Corr'd Nav, Kongsberg 14208, img#28) (B) (T.A) |
| 20-Mar-2023 | 07:40:20 | 529 | ECR_ENV_43 | | | camera | 64 | 526937 | 6417296 | 526959 | 6417301 | -21 | -5 | 22 | 76 | AM | (Corr'd Nav, Kongsberg 14208, img#29) (B) (T.A) |
| 20-Mar-2023 | 07:40:28 | 530 | ECR_ENV_43 | | | camera | 64 | 526938 | 6417295 | 526959 | 6417301 | -20 | -6 | 21 | 72 | AM | (Corr'd Nav, Kongsberg 14208, img#30) (B) (T.A) |
| 20-Mar-2023 | 07:40:43 | 531 | ECR_ENV_43 | | | camera | 64 | 526940 | 6417295 | 526959 | 6417301 | -18 | -6 | 19 | 70 | AM | (Corr'd Nav, Kongsberg 14208, img#31) (B) (T.A) |
| 20-Mar-2023 | 07:41:06 | 532 | ECR_ENV_43 | | | camera | 63 | 526942 | 6417295 | 526959 | 6417301 | -16 | -6 | 17 | 69 | AM | (Corr'd Nav, Kongsberg 14208, img#32) (B) (T.A) |
| 20-Mar-2023 | 07:41:14 | 533 | ECR_ENV_43 | | | camera | 63 | 526943 | 6417295 | 526959 | 6417301 | -15 | -7 | 17 | 67 | AM | (Corr'd Nav, Kongsberg 14208, img#33) (B) (T.A) |
| 20-Mar-2023 | 07:41:45 | 534 | ECR_ENV_43 | | | camera | 63 | 526948 | 6417295 | 526959 | 6417301 | -11 | -6 | 12 | 60 | AM | (Corr'd Nav, Kongsberg 14208, img#34) (B) (T.A) |
| 20-Mar-2023 | 07:42:09 | 535 | ECR_ENV_43 | | | camera | 64 | 526951 | 6417296 | 526959 | 6417301 | -8 | -6 | 10 | 55 | AM | (Corr'd Nav, Kongsberg 14208, img#35) (B) (T.A) |
| 20-Mar-2023 | 07:42:16 | 536 | ECR_ENV_43 | | | camera | 64 | 526952 | 6417295 | 526959 | 6417301 | -6 | -6 | 9 | 43 | AM | (Corr'd Nav, Kongsberg 14208, img#36) (B) (T.A) |
| 20-Mar-2023 | 07:42:27 | 537 | ECR_ENV_43 | | | camera | 63 | 526953 | 6417296 | 526959 | 6417301 | -6 | -5 | 8 | 47 | AM | (Corr'd Nav, Kongsberg 14208, img#37) (B) (T.A) |
| 20-Mar-2023 | 07:42:39 | 538 | ECR_ENV_43 | | | camera | 64 | 526955 | 6417297 | 526959 | 6417301 | -3 | -4 | 5 | 39 | AM | (Corr'd Nav, Kongsberg 14208, img#38) (B) (T.A) |
| 20-Mar-2023 | 07:42:46 | 539 | ECR_ENV_43 | | | camera | 64 | 526956 | 6417295 | 526959 | 6417301 | -2 | -6 | 6 | 22 | AM | (Corr'd Nav, Kongsberg 14208, img#39) (B) (T.A) |
| 20-Mar-2023 | 07:43:00 | 540 | ECR_ENV_43 | | | camera | 64 | 526958 | 6417296 | 526959 | 6417301 | -1 | -5 | 5 | 9 | AM | (Corr'd Nav, Kongsberg 14208, img#40) (B) (T.A) |
| 20-Mar-2023 | 07:43:07 | 541 | ECR_ENV_43 | | | camera | 65 | 526959 | 6417295 | 526959 | 6417301 | 0 | -6 | 6 | -4 | AM | (Raw Nav, Kongsberg 14208, img#41) (B) |
| 20-Mar-2023 | 07:43:23 | 542 | ECR_ENV_43 | | | camera | 64 | 526961 | 6417295 | 526959 | 6417301 | 3 | -7 | 7 | -21 | AM | (Corr'd Nav, Kongsberg 14208, img#42) (B) (T.A) |
| 20-Mar-2023 | 07:43:51 | 543 | ECR_ENV_43 | | | camera | 64 | 526963 | 6417295 | 526959 | 6417301 | 5 | -6 | 7 | -38 | AM | (Corr'd Nav, Kongsberg 14208, img#43) (B) (T.A) |
| 20-Mar-2023 | 07:44:00 | 544 | ECR_ENV_43 | | | camera | 64 | 526964 | 6417294 | 526959 | 6417301 | 6 | -7 | 9 | -41 | AM | (Corr'd Nav, Kongsberg 14208, img#44) (B) (T.A) |
| 20-Mar-2023 | 07:44:13 | 545 | ECR_ENV_43 | | | camera | 64 | 526966 | 6417295 | 526959 | 6417301 | 8 | -6 | 10 | -52 | AM | (Corr'd Nav, Kongsberg 14208, img#45) (B) (T.A) |
| 20-Mar-2023 | 07:44:29 | 546 | ECR_ENV_43 | | | camera | 64 | 526969 | 6417295 | 526959 | 6417301 | 10 | -6 | 12 | -59 | AM | (Corr'd Nav, Kongsberg 14208, img#46) (B) (T.A) |
| 20-Mar-2023 | 07:44:48 | 547 | ECR_ENV_43 | | | camera | 64 | 526971 | 6417295 | 526959 | 6417301 | 12 | -6 | 14 | -63 | AM | (Corr'd Nav, Kongsberg 14208, img#47) (B) (T.A) |
| 20-Mar-2023 | 07:44:52 | 548 | ECR_ENV_43 | | | camera | 64 | 526972 | 6417295 | 526959 | 6417301 | 13 | -6 | 15 | -64 | AM | (Corr'd Nav, Kongsberg 14208, img#48) (B) (T.A) |
| 20-Mar-2023 | 07:45:11 | 549 | ECR_ENV_43 | | | camera | 64 | 526974 | 6417294 | 526959 | 6417301 | 16 | -7 | 17 | -65 | AM | (Corr'd Nav, Kongsberg 14208, img#49) (B) (T.A) |
| 20-Mar-2023 | 07:45:41 | 550 | ECR_ENV_43 | | | camera | 64 | 526978 | 6417295 | 526959 | 6417301 | 19 | -6 | 20 | -74 | AM | (Corr'd Nav, Kongsberg 14208, img#50) (B) (T.A) |
| 20-Mar-2023 | 07:45:52 | 551 | ECR_ENV_43 | | | camera | 64 | 526979 | 6417296 | 526959 | 6417301 | 21 | -5 | 22 | -75 | AM | (Corr'd Nav, Kongsberg 14208, img#51) (B) (T.A) |
| 20-Mar-2023 | 07:46:09 | 552 | ECR_ENV_43 | | | camera | 64 | 526981 | 6417297 | 526959 | 6417301 | 23 | -5 | 23 | -79 | AM | (Corr'd Nav, Kongsberg 14208, img#52) (B) (T.A) |
| 20-Mar-2023 | 07:46:25 | 553 | ECR_ENV_43 | | | camera | 64 | 526984 | 6417296 | 526959 | 6417301 | 26 | -5 | 26 | -79 | AM | (Corr'd Nav, Kongsberg 14208, img#53) (B) (T.A) |
| 20-Mar-2023 | 07:46:31 | 554 | ECR_ENV_43 | | | camera | 64 | 526985 | 6417295 | 526959 | 6417301 | 27 | -6 | 27 | -77 | AM | (Corr'd Nav, Kongsberg 14208, img#54) (B) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 | | |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 20-Mar-2023 | 07:46:55 | 555 | ECR_ENV_43 | | | camera | 65 | 526987 | 6417296 | 526959 | 6417301 | 29 | -5 | 29 | -80 | AM | (Raw Nav, Kongsberg 14208, img#55) (B) |
| 20-Mar-2023 | 07:47:23 | 556 | ECR_ENV_43 | | | camera | 65 | 526991 | 6417295 | 526959 | 6417301 | 33 | -6 | 33 | -79 | AM | (Raw Nav, Kongsberg 14208, img#56) (B) |
| 20-Mar-2023 | 07:47:44 | 557 | ECR_ENV_43 | | | camera | 65 | 526993 | 6417296 | 526959 | 6417301 | 35 | -5 | 35 | -82 | AM | (Raw Nav, Kongsberg 14208, img#57) (B) |
| 20-Mar-2023 | 07:47:50 | 558 | ECR_ENV_43 | | | camera | 65 | 526994 | 6417295 | 526959 | 6417301 | 36 | -6 | 36 | -80 | AM | (Raw Nav, Kongsberg 14208, img#58) (B) |
| 20-Mar-2023 | 07:48:08 | 559 | ECR_ENV_43 | | | camera | 65 | 526996 | 6417295 | 526959 | 6417301 | 38 | -6 | 38 | -81 | AM | (Raw Nav, Kongsberg 14208, img#59) (B) |
| 20-Mar-2023 | 07:48:22 | 560 | ECR_ENV_43 | | | camera | 65 | 527000 | 6417289 | 526959 | 6417301 | 42 | -12 | 43 | -74 | AM | (Raw Nav, Kongsberg 14208, img#60) (B) |
| 20-Mar-2023 | 09:38:03 | 561 | ECR_ENV_42 | | | camera | 78 | 526503 | 6425764 | 526559 | 6425774 | -56 | -10 | 56 | 80 | AM | (Corr'd Nav, Kongsberg 14208, img#1) (B) (T.A) |
| 20-Mar-2023 | 09:39:48 | 562 | ECR_ENV_42 | | | camera | 78 | 526503 | 6425773 | 526559 | 6425774 | -56 | -2 | 56 | 88 | AM | (Corr'd Nav, Kongsberg 14208, img#2) (B) (T.A) |
| 20-Mar-2023 | 09:40:33 | 563 | ECR_ENV_42 | | | camera | 78 | 526507 | 6425772 | 526559 | 6425774 | -52 | -2 | 52 | 88 | AM | (Corr'd Nav, Kongsberg 14208, img#3) (B) (T.A) |
| 20-Mar-2023 | 09:40:52 | 564 | ECR_ENV_42 | | | camera | 78 | 526510 | 6425772 | 526559 | 6425774 | -48 | -2 | 48 | 87 | AM | (Corr'd Nav, Kongsberg 14208, img#4) (B) (T.A) |
| 20-Mar-2023 | 09:41:05 | 565 | ECR_ENV_42 | | | camera | 78 | 526513 | 6425773 | 526559 | 6425774 | -46 | -2 | 46 | 88 | AM | (Corr'd Nav, Kongsberg 14208, img#5) (B) (T.A) |
| 20-Mar-2023 | 09:41:36 | 566 | ECR_ENV_42 | | | camera | 78 | 526516 | 6425774 | 526559 | 6425774 | -43 | 0 | 43 | 90 | AM | (Corr'd Nav, Kongsberg 14208, img#6) (B) (T.A) |
| 20-Mar-2023 | 09:41:58 | 567 | ECR_ENV_42 | | | camera | 78 | 526518 | 6425772 | 526559 | 6425774 | -40 | -3 | 40 | 86 | AM | (Corr'd Nav, Kongsberg 14208, img#7) (B) (T.A) |
| 20-Mar-2023 | 09:42:28 | 568 | ECR_ENV_42 | | | camera | 78 | 526521 | 6425776 | 526559 | 6425774 | -38 | 2 | 38 | 92 | AM | (Corr'd Nav, Kongsberg 14208, img#8) (B) (T.A) |
| 20-Mar-2023 | 09:42:44 | 569 | ECR_ENV_42 | | | camera | 78 | 526523 | 6425774 | 526559 | 6425774 | -35 | 0 | 35 | 90 | AM | (Corr'd Nav, Kongsberg 14208, img#9) (B) (T.A) |
| 20-Mar-2023 | 09:43:21 | 570 | ECR_ENV_42 | | | camera | 78 | 526527 | 6425777 | 526559 | 6425774 | -32 | 3 | 32 | 95 | AM | (Corr'd Nav, Kongsberg 14208, img#10) (B) (T.A) |
| 20-Mar-2023 | 09:43:38 | 571 | ECR_ENV_42 | | | camera | 78 | 526529 | 6425776 | 526559 | 6425774 | -29 | 2 | 29 | 93 | AM | (Corr'd Nav, Kongsberg 14208, img#11) (B) (T.A) |
| 20-Mar-2023 | 09:44:23 | 572 | ECR_ENV_42 | | | camera | 78 | 526534 | 6425775 | 526559 | 6425774 | -24 | 1 | 24 | 92 | AM | (Corr'd Nav, Kongsberg 14208, img#12) (B) (T.A) |
| 20-Mar-2023 | 09:44:53 | 573 | ECR_ENV_42 | | | camera | 78 | 526537 | 6425775 | 526559 | 6425774 | -22 | 1 | 22 | 92 | AM | (Corr'd Nav, Kongsberg 14208, img#13) (B) (T.A) |
| 20-Mar-2023 | 09:45:13 | 574 | ECR_ENV_42 | | | camera | 78 | 526541 | 6425776 | 526559 | 6425774 | -18 | 1 | 18 | 95 | AM | (Corr'd Nav, Kongsberg 14208, img#14) (B) (T.A) |
| 20-Mar-2023 | 09:45:36 | 575 | ECR_ENV_42 | | | camera | 78 | 526543 | 6425777 | 526559 | 6425774 | -15 | 2 | 16 | 98 | AM | (Corr'd Nav, Kongsberg 14208, img#15) (B) (T.A) |
| 20-Mar-2023 | 09:45:50 | 576 | ECR_ENV_42 | | | camera | 78 | 526545 | 6425777 | 526559 | 6425774 | -14 | 3 | 14 | 102 | AM | (Corr'd Nav, Kongsberg 14208, img#16) (B) (T.A) |
| 20-Mar-2023 | 09:46:52 | 577 | ECR_ENV_42 | | | camera | 78 | 526552 | 6425778 | 526559 | 6425774 | -6 | 4 | 7 | 120 | AM | (Corr'd Nav, Kongsberg 14208, img#17) (B) (T.A) |
| 20-Mar-2023 | 09:47:23 | 578 | ECR_ENV_42 | | | camera | 78 | 526557 | 6425780 | 526559 | 6425774 | -2 | 5 | 6 | 161 | AM | (Corr'd Nav, Kongsberg 14208, img#18) (B) (T.A) |
| 20-Mar-2023 | 09:47:43 | 579 | ECR_ENV_42 | | | camera | 78 | 526560 | 6425779 | 526559 | 6425774 | 1 | 4 | 4 | -165 | AM | (Corr'd Nav, Kongsberg 14208, img#19) (B) (T.A) |
| 20-Mar-2023 | 09:47:51 | 580 | ECR_ENV_42 | | | camera | 78 | 526561 | 6425777 | 526559 | 6425774 | 2 | 3 | 4 | -140 | AM | (Corr'd Nav, Kongsberg 14208, img#20) (B) (T.A) |
| 20-Mar-2023 | 09:48:01 | 581 | ECR_ENV_42 | | | camera | 78 | 526563 | 6425779 | 526559 | 6425774 | 4 | 5 | 6 | -136 | AM | (Corr'd Nav, Kongsberg 14208, img#21) (B) (T.A) |
| 20-Mar-2023 | 09:48:09 | 582 | ECR_ENV_42 | | | camera | 78 | 526564 | 6425777 | 526559 | 6425774 | 5 | 3 | 6 | -121 | AM | (Corr'd Nav, Kongsberg 14208, img#22) (B) (T.A) |
| 20-Mar-2023 | 09:48:14 | 583 | ECR_ENV_42 | | | camera | 78 | 526565 | 6425778 | 526559 | 6425774 | 7 | 4 | 8 | -120 | AM | (Corr'd Nav, Kongsberg 14208, img#23) (B) (T.A) |
| 20-Mar-2023 | 09:48:19 | 584 | ECR_ENV_42 | | | camera | 78 | 526566 | 6425779 | 526559 | 6425774 | 8 | 5 | 9 | -120 | AM | (Corr'd Nav, Kongsberg 14208, img#24) (B) (T.A) |
| 20-Mar-2023 | 09:48:37 | 585 | ECR_ENV_42 | | | camera | 78 | 526572 | 6425778 | 526559 | 6425774 | 13 | 4 | 14 | -107 | AM | (Corr'd Nav, Kongsberg 14208, img#25) (B) (T.A) |
| 20-Mar-2023 | 09:48:44 | 586 | ECR_ENV_42 | | | camera | 78 | 526574 | 6425778 | 526559 | 6425774 | 15 | 3 | 15 | -102 | AM | (Corr'd Nav, Kongsberg 14208, img#26) (B) (T.A) |
| 20-Mar-2023 | 09:48:49 | 587 | ECR_ENV_42 | | | camera | 78 | 526575 | 6425778 | 526559 | 6425774 | 16 | 4 | 17 | -104 | AM | (Corr'd Nav, Kongsberg 14208, img#27) (B) (T.A) |
| 20-Mar-2023 | 09:48:58 | 588 | ECR_ENV_42 | | | camera | 78 | 526576 | 6425775 | 526559 | 6425774 | 18 | 1 | 18 | -93 | AM | (Corr'd Nav, Kongsberg 14208, img#28) (B) (T.A) |
| 20-Mar-2023 | 09:49:14 | 589 | ECR_ENV_42 | | | camera | 78 | 526580 | 6425777 | 526559 | 6425774 | 21 | 3 | 21 | -98 | AM | (Corr'd Nav, Kongsberg 14208, img#29) (B) (T.A) |
| 20-Mar-2023 | 09:49:23 | 590 | ECR_ENV_42 | | | camera | 78 | 526581 | 6425775 | 526559 | 6425774 | 23 | 1 | 23 | -92 | AM | (Corr'd Nav, Kongsberg 14208, img#30) (B) (T.A) |
| 20-Mar-2023 | 09:49:32 | 591 | ECR_ENV_42 | | | camera | 78 | 526582 | 6425775 | 526559 | 6425774 | 24 | 0 | 24 | -91 | AM | (Corr'd Nav, Kongsberg 14208, img#31) (B) (T.A) |
| 20-Mar-2023 | 09:49:39 | 592 | ECR_ENV_42 | | | camera | 78 | 526586 | 6425778 | 526559 | 6425774 | 28 | 4 | 28 | -98 | AM | (Corr'd Nav, Kongsberg 14208, img#32) (B) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 20-Mar-2023 | 09:49:45 | 593 | ECR_ENV_42 | | | camera | 78 | 526587 | 6425779 | 526559 | 6425774 | 29 | 5 | 29 | -100 | AM | (Corr'd Nav, Kongsberg 14208, img#33) (B) (T.A) |
| 20-Mar-2023 | 09:49:51 | 594 | ECR_ENV_42 | | | camera | 78 | 526588 | 6425777 | 526559 | 6425774 | 30 | 3 | 30 | -96 | AM | (Corr'd Nav, Kongsberg 14208, img#34) (B) (T.A) |
| 20-Mar-2023 | 09:49:57 | 595 | ECR_ENV_42 | | | camera | 80 | 526589 | 6425779 | 526559 | 6425774 | 30 | 5 | 31 | -99 | AM | (Raw Nav, Kongsberg 14208, img#35) (B) |
| 20-Mar-2023 | 09:50:13 | 596 | ECR_ENV_42 | | | camera | 78 | 526592 | 6425778 | 526559 | 6425774 | 34 | 4 | 34 | -96 | AM | (Corr'd Nav, Kongsberg 14208, img#36) (B) (T.A) |
| 20-Mar-2023 | 09:50:31 | 597 | ECR_ENV_42 | | | camera | 78 | 526594 | 6425777 | 526559 | 6425774 | 36 | 2 | 36 | -94 | AM | (Corr'd Nav, Kongsberg 14208, img#37) (B) (T.A) |
| 20-Mar-2023 | 09:50:46 | 598 | ECR_ENV_42 | | | camera | 78 | 526595 | 6425779 | 526559 | 6425774 | 37 | 5 | 37 | -98 | AM | (Corr'd Nav, Kongsberg 14208, img#38) (B) (T.A) |
| 20-Mar-2023 | 09:50:53 | 599 | ECR_ENV_42 | | | camera | 78 | 526596 | 6425780 | 526559 | 6425774 | 37 | 6 | 37 | -99 | AM | (Corr'd Nav, Kongsberg 14208, img#39) (B) (T.A) |
| 20-Mar-2023 | 11:21:06 | 600 | ECR_ENV_41 | | | camera | 74 | 529552 | 6430638 | 529600 | 6430646 | -48 | -8 | 49 | 80 | AM | (Corr'd Nav, Kongsberg 14208, img#1) (B) (T.A) |
| 20-Mar-2023 | 11:21:51 | 601 | ECR_ENV_41 | | | camera | 74 | 529553 | 6430643 | 529600 | 6430646 | -48 | -3 | 48 | 86 | AM | (Corr'd Nav, Kongsberg 14208, img#2) (B) (T.A) |
| 20-Mar-2023 | 11:21:59 | 602 | ECR_ENV_41 | | | camera | 74 | 529556 | 6430641 | 529600 | 6430646 | -44 | -6 | 45 | 83 | AM | (Corr'd Nav, Kongsberg 14208, img#3) (B) (T.A) |
| 20-Mar-2023 | 11:22:08 | 603 | ECR_ENV_41 | | | camera | 74 | 529552 | 6430644 | 529600 | 6430646 | -48 | -3 | 48 | 87 | AM | (Corr'd Nav, Kongsberg 14208, img#4) (B) (T.A) |
| 20-Mar-2023 | 11:22:28 | 604 | ECR_ENV_41 | | | camera | 74 | 529553 | 6430645 | 529600 | 6430646 | -47 | -1 | 47 | 89 | AM | (Corr'd Nav, Kongsberg 14208, img#5) (B) (T.A) |
| 20-Mar-2023 | 11:22:48 | 605 | ECR_ENV_41 | | | camera | 74 | 529554 | 6430646 | 529600 | 6430646 | -46 | 0 | 46 | 90 | AM | (Corr'd Nav, Kongsberg 14208, img#6) (B) (T.A) |
| 20-Mar-2023 | 11:22:55 | 606 | ECR_ENV_41 | | | camera | 74 | 529554 | 6430649 | 529600 | 6430646 | -46 | 3 | 46 | 93 | | (Corr'd Nav, Kongsberg 14208, img#7) (B) (T.A) # No photo taken |
| 20-Mar-2023 | 11:23:02 | 607 | ECR_ENV_41 | | | camera | 74 | 529555 | 6430651 | 529600 | 6430646 | -45 | 5 | 45 | 96 | AM | (Corr'd Nav, Kongsberg 14208, img#8) (B) (T.A) |
| 20-Mar-2023 | 11:23:05 | 608 | ECR_ENV_41 | | | camera | 74 | 529556 | 6430645 | 529600 | 6430646 | -44 | -1 | 44 | 89 | AM | (Corr'd Nav, Kongsberg 14208, img#9) (B) (T.A) |
| 20-Mar-2023 | 11:23:11 | 609 | ECR_ENV_41 | | | camera | 74 | 529558 | 6430649 | 529600 | 6430646 | -42 | 2 | 42 | 93 | AM | (Corr'd Nav, Kongsberg 14208, img#10) (B) (T.A) |
| 20-Mar-2023 | 11:23:18 | 610 | ECR_ENV_41 | | | camera | 74 | 529558 | 6430648 | 529600 | 6430646 | -42 | 2 | 42 | 92 | AM | (Corr'd Nav, Kongsberg 14208, img#11) (B) (T.A) |
| 20-Mar-2023 | 11:23:25 | 611 | ECR_ENV_41 | | | camera | 74 | 529559 | 6430648 | 529600 | 6430646 | -41 | 1 | 41 | 92 | AM | (Corr'd Nav, Kongsberg 14208, img#12) (B) (T.A) |
| 20-Mar-2023 | 11:23:31 | 612 | ECR_ENV_41 | | | camera | 74 | 529560 | 6430648 | 529600 | 6430646 | -40 | 1 | 40 | 92 | AM | (Corr'd Nav, Kongsberg 14208, img#13) (B) (T.A) |
| 20-Mar-2023 | 11:23:37 | 613 | ECR_ENV_41 | | | camera | 74 | 529562 | 6430648 | 529600 | 6430646 | -38 | 1 | 38 | 92 | AM | (Corr'd Nav, Kongsberg 14208, img#14) (B) (T.A) |
| 20-Mar-2023 | 11:23:45 | 614 | ECR_ENV_41 | | | camera | 74 | 529564 | 6430646 | 529600 | 6430646 | -36 | 0 | 36 | 90 | AM | (Corr'd Nav, Kongsberg 14208, img#15) (B) (T.A) |
| 20-Mar-2023 | 11:23:52 | 615 | ECR_ENV_41 | | | camera | 74 | 529566 | 6430647 | 529600 | 6430646 | -34 | 1 | 34 | 92 | AM | (Corr'd Nav, Kongsberg 14208, img#16) (B) (T.A) |
| 20-Mar-2023 | 11:23:58 | 616 | ECR_ENV_41 | | | camera | 74 | 529567 | 6430648 | 529600 | 6430646 | -33 | 1 | 33 | 93 | AM | (Corr'd Nav, Kongsberg 14208, img#17) (B) (T.A) |
| 20-Mar-2023 | 11:24:17 | 617 | ECR_ENV_41 | | | camera | 74 | 529570 | 6430650 | 529600 | 6430646 | -30 | 3 | 30 | 96 | AM | (Corr'd Nav, Kongsberg 14208, img#18) (B) (T.A) |
| 20-Mar-2023 | 11:24:25 | 618 | ECR_ENV_41 | | | camera | 74 | 529571 | 6430651 | 529600 | 6430646 | -29 | 4 | 29 | 98 | AM | (Corr'd Nav, Kongsberg 14208, img#19) (B) (T.A) |
| 20-Mar-2023 | 11:24:51 | 619 | ECR_ENV_41 | | | camera | 74 | 529576 | 6430651 | 529600 | 6430646 | -24 | 5 | 25 | 102 | AM | (Corr'd Nav, Kongsberg 14208, img#20) (B) (T.A) |
| 20-Mar-2023 | 11:24:59 | 620 | ECR_ENV_41 | | | camera | 74 | 529577 | 6430652 | 529600 | 6430646 | -24 | 5 | 24 | 103 | AM | (Corr'd Nav, Kongsberg 14208, img#21) (B) (T.A) |
| 20-Mar-2023 | 11:25:12 | 621 | ECR_ENV_41 | | | camera | 74 | 529580 | 6430653 | 529600 | 6430646 | -20 | 7 | 22 | 109 | AM | (Corr'd Nav, Kongsberg 14208, img#22) (B) (T.A) |
| 20-Mar-2023 | 11:25:44 | 622 | ECR_ENV_41 | | | camera | 74 | 529584 | 6430654 | 529600 | 6430646 | -16 | 7 | 18 | 114 | AM | (Corr'd Nav, Kongsberg 14208, img#23) (B) (T.A) |
| 20-Mar-2023 | 11:26:06 | 623 | ECR_ENV_41 | | | camera | 74 | 529585 | 6430652 | 529600 | 6430646 | -15 | 5 | 16 | 110 | AM | (Corr'd Nav, Kongsberg 14208, img#24) (B) (T.A) |
| 20-Mar-2023 | 11:26:30 | 624 | ECR_ENV_41 | | | camera | 74 | 529586 | 6430652 | 529600 | 6430646 | -14 | 6 | 15 | 113 | AM | (Corr'd Nav, Kongsberg 14208, img#25) (B) (T.A) |
| 20-Mar-2023 | 11:26:36 | 625 | ECR_ENV_41 | | | camera | 74 | 529588 | 6430652 | 529600 | 6430646 | -13 | 5 | 14 | 113 | AM | (Corr'd Nav, Kongsberg 14208, img#26) (B) (T.A) |
| 20-Mar-2023 | 11:27:05 | 626 | ECR_ENV_41 | | | camera | 74 | 529594 | 6430651 | 529600 | 6430646 | -6 | 4 | 7 | 127 | AM | (Corr'd Nav, Kongsberg 14208, img#27) (B) (T.A) |
| 20-Mar-2023 | 11:27:13 | 627 | ECR_ENV_41 | | | camera | 74 | 529596 | 6430649 | 529600 | 6430646 | -4 | 3 | 5 | 123 | AM | (Corr'd Nav, Kongsberg 14208, img#28) (B) (T.A) |
| 20-Mar-2023 | 11:27:30 | 628 | ECR_ENV_41 | | | camera | 74 | 529601 | 6430650 | 529600 | 6430646 | 1 | 3 | 3 | -162 | AM | (Corr'd Nav, Kongsberg 14208, img#29) (B) (T.A) |
| 20-Mar-2023 | 11:27:37 | 629 | ECR_ENV_41 | | | camera | 74 | 529603 | 6430651 | 529600 | 6430646 | 3 | 4 | 5 | -146 | AM | (Corr'd Nav, Kongsberg 14208, img#30) (B) (T.A) |
| 20-Mar-2023 | 11:27:59 | 630 | ECR_ENV_41 | | | camera | 74 | 529605 | 6430650 | 529600 | 6430646 | 5 | 4 | 6 | -124 | AM | (Corr'd Nav, Kongsberg 14208, img#31) (B) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Seafloor Sampling Positioning Summary

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | | x | 6.7 | y | 21.94 | z | 2.93 | |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 20-Mar-2023 | 11:28:22 | 631 | ECR_ENV_41 | | | camera | 74 | 529608 | 6430650 | 529600 | 6430646 | 8 | 4 | 9 | -114 | AM | (Corr'd Nav, Kongsberg 14208, img#32) (B) (T.A) |
| 20-Mar-2023 | 11:28:33 | 632 | ECR_ENV_41 | | | camera | 74 | 529609 | 6430651 | 529600 | 6430646 | 9 | 5 | 11 | -118 | AM | (Corr'd Nav, Kongsberg 14208, img#33) (B) (T.A) |
| 20-Mar-2023 | 11:29:00 | 633 | ECR_ENV_41 | | | camera | 74 | 529613 | 6430652 | 529600 | 6430646 | 13 | 5 | 14 | -113 | AM | (Corr'd Nav, Kongsberg 14208, img#34) (B) (T.A) |
| 20-Mar-2023 | 11:29:21 | 634 | ECR_ENV_41 | | | camera | 74 | 529618 | 6430652 | 529600 | 6430646 | 18 | 6 | 19 | -108 | AM | (Corr'd Nav, Kongsberg 14208, img#35) (B) (T.A) |
| 20-Mar-2023 | 11:29:29 | 635 | ECR_ENV_41 | | | camera | 74 | 529621 | 6430651 | 529600 | 6430646 | 21 | 4 | 21 | -102 | AM | (Corr'd Nav, Kongsberg 14208, img#36) (B) (T.A) |
| 20-Mar-2023 | 11:29:57 | 636 | ECR_ENV_41 | | | camera | 74 | 529628 | 6430652 | 529600 | 6430646 | 28 | 5 | 28 | -101 | AM | (Corr'd Nav, Kongsberg 14208, img#37) (B) (T.A) |
| 20-Mar-2023 | 11:30:10 | 637 | ECR_ENV_41 | | | camera | 74 | 529631 | 6430652 | 529600 | 6430646 | 31 | 5 | 32 | -100 | AM | (Corr'd Nav, Kongsberg 14208, img#38) (B) (T.A) |
| 20-Mar-2023 | 11:30:19 | 638 | ECR_ENV_41 | | | camera | 74 | 529632 | 6430651 | 529600 | 6430646 | 32 | 5 | 33 | -99 | AM | (Corr'd Nav, Kongsberg 14208, img#39) (B) (T.A) |
| 20-Mar-2023 | 11:30:48 | 639 | ECR_ENV_41 | | | camera | 74 | 529638 | 6430651 | 529600 | 6430646 | 38 | 4 | 38 | -97 | AM | (Corr'd Nav, Kongsberg 14208, img#40) (B) (T.A) |
| 20-Mar-2023 | 13:15:08 | 640 | ECR_ENV_40 | | | camera | 69 | 527640 | 6437739 | 527687 | 6437681 | -47 | 58 | 75 | 141 | DM | (Corr'd Nav, Kongsberg 14208, img#1) (B) (T.A) |
| 20-Mar-2023 | 13:15:28 | 641 | ECR_ENV_40 | | | camera | 69 | 527639 | 6437733 | 527687 | 6437681 | -48 | 52 | 71 | 138 | DM | (Corr'd Nav, Kongsberg 14208, img#2) (B) (T.A) |
| 20-Mar-2023 | 13:16:24 | 642 | ECR_ENV_40 | | | camera | 69 | 527637 | 6437718 | 527687 | 6437681 | -50 | 37 | 62 | 126 | DM | (Corr'd Nav, Kongsberg 14208, img#3) (B) (T.A) |
| 20-Mar-2023 | 13:16:57 | 643 | ECR_ENV_40 | | | camera | 69 | 527640 | 6437711 | 527687 | 6437681 | -48 | 30 | 56 | 122 | DM | (Corr'd Nav, Kongsberg 14208, img#4) (B) (T.A) |
| 20-Mar-2023 | 13:17:36 | 644 | ECR_ENV_40 | | | camera | 69 | 527644 | 6437704 | 527687 | 6437681 | -43 | 23 | 49 | 119 | DM | (Corr'd Nav, Kongsberg 14208, img#5) (B) (T.A) |
| 20-Mar-2023 | 13:17:47 | 645 | ECR_ENV_40 | | | camera | 69 | 527645 | 6437702 | 527687 | 6437681 | -42 | 21 | 47 | 117 | DM | (Corr'd Nav, Kongsberg 14208, img#6) (B) (T.A) |
| 20-Mar-2023 | 13:18:24 | 646 | ECR_ENV_40 | | | camera | 69 | 527648 | 6437698 | 527687 | 6437681 | -39 | 17 | 43 | 113 | DM | (Corr'd Nav, Kongsberg 14208, img#7) (B) (T.A) |
| 20-Mar-2023 | 13:18:37 | 647 | ECR_ENV_40 | | | camera | 69 | 527654 | 6437701 | 527687 | 6437681 | -33 | 21 | 39 | 122 | DM | (Corr'd Nav, Kongsberg 14208, img#8) (B) (T.A) |
| 20-Mar-2023 | 13:18:53 | 648 | ECR_ENV_40 | | | camera | 69 | 527656 | 6437701 | 527687 | 6437681 | -32 | 20 | 37 | 122 | | (Corr'd Nav, Kongsberg 14208, img#9) (B) (T.A)<br># No photo taken |
| 20-Mar-2023 | 13:19:03 | 649 | ECR_ENV_40 | | | camera | 69 | 527656 | 6437699 | 527687 | 6437681 | -31 | 18 | 36 | 120 | DM | (Corr'd Nav, Kongsberg 14208, img#10) (B) (T.A) |
| 20-Mar-2023 | 13:19:13 | 650 | ECR_ENV_40 | | | camera | 69 | 527660 | 6437700 | 527687 | 6437681 | -27 | 19 | 33 | 125 | DM | (Corr'd Nav, Kongsberg 14208, img#11) (B) (T.A) |
| 20-Mar-2023 | 13:19:26 | 651 | ECR_ENV_40 | | | camera | 69 | 527664 | 6437704 | 527687 | 6437681 | -24 | 23 | 33 | 135 | DM | (Corr'd Nav, Kongsberg 14208, img#12) (B) (T.A) |
| 20-Mar-2023 | 13:19:41 | 652 | ECR_ENV_40 | | | camera | 70 | 527669 | 6437703 | 527687 | 6437681 | -18 | 22 | 29 | 141 | DM | (Raw Nav, Kongsberg 14208, img#13) (B) |
| 20-Mar-2023 | 13:19:55 | 653 | ECR_ENV_40 | | | camera | 70 | 527673 | 6437702 | 527687 | 6437681 | -14 | 21 | 26 | 146 | DM | (Raw Nav, Kongsberg 14208, img#14) (B) |
| 20-Mar-2023 | 13:20:12 | 654 | ECR_ENV_40 | | | camera | 70 | 527675 | 6437699 | 527687 | 6437681 | -12 | 18 | 22 | 146 | DM | (Raw Nav, Kongsberg 14208, img#15) (B) |
| 20-Mar-2023 | 13:20:21 | 655 | ECR_ENV_40 | | | camera | 70 | 527681 | 6437701 | 527687 | 6437681 | -6 | 20 | 21 | 163 | DM | (Raw Nav, Kongsberg 14208, img#16) (B) |
| 20-Mar-2023 | 13:20:34 | 656 | ECR_ENV_40 | | | camera | 70 | 527686 | 6437700 | 527687 | 6437681 | -1 | 19 | 19 | 176 | DM | (Raw Nav, Kongsberg 14208, img#17) (B) |
| 20-Mar-2023 | 13:20:51 | 657 | ECR_ENV_40 | | | camera | 70 | 527685 | 6437698 | 527687 | 6437681 | -2 | 17 | 17 | 173 | DM | (Raw Nav, Kongsberg 14208, img#18) (B) |
| 20-Mar-2023 | 13:21:03 | 658 | ECR_ENV_40 | | | camera | 70 | 527693 | 6437695 | 527687 | 6437681 | 6 | 14 | 15 | -158 | DM | (Raw Nav, Kongsberg 14208, img#19) (B) |
| 20-Mar-2023 | 13:21:15 | 659 | ECR_ENV_40 | | | camera | 70 | 527696 | 6437694 | 527687 | 6437681 | 9 | 13 | 16 | -146 | DM | (Raw Nav, Kongsberg 14208, img#20) (B) |
| 20-Mar-2023 | 13:21:29 | 660 | ECR_ENV_40 | | | camera | 70 | 527699 | 6437691 | 527687 | 6437681 | 12 | 10 | 16 | -131 | DM | (Raw Nav, Kongsberg 14208, img#21) (B) |
| 20-Mar-2023 | 13:21:42 | 661 | ECR_ENV_40 | | | camera | 70 | 527702 | 6437689 | 527687 | 6437681 | 15 | 8 | 17 | -119 | DM | (Raw Nav, Kongsberg 14208, img#22) (B) |
| 20-Mar-2023 | 13:22:07 | 662 | ECR_ENV_40 | | | camera | 70 | 527703 | 6437686 | 527687 | 6437681 | 16 | 5 | 17 | -108 | DM | (Raw Nav, Kongsberg 14208, img#23) (B) |
| 20-Mar-2023 | 13:22:16 | 663 | ECR_ENV_40 | | | camera | 70 | 527706 | 6437686 | 527687 | 6437681 | 19 | 5 | 20 | -106 | DM | (Raw Nav, Kongsberg 14208, img#24) (B) |
| 20-Mar-2023 | 13:22:31 | 664 | ECR_ENV_40 | | | camera | 70 | 527705 | 6437684 | 527687 | 6437681 | 18 | 3 | 18 | -100 | DM | (Raw Nav, Kongsberg 14208, img#25) (B) |
| 20-Mar-2023 | 13:22:55 | 665 | ECR_ENV_40 | | | camera | 71 | 527705 | 6437683 | 527687 | 6437681 | 18 | 2 | 18 | -97 | DM | (Raw Nav, Kongsberg 14208, img#26) (B) |
| 20-Mar-2023 | 13:23:19 | 666 | ECR_ENV_40 | | | camera | 70 | 527703 | 6437683 | 527687 | 6437681 | 16 | 2 | 16 | -98 | DM | (Raw Nav, Kongsberg 14208, img#27) (B) |
| 20-Mar-2023 | 13:24:13 | 667 | ECR_ENV_40 | | | camera | 71 | 527698 | 6437679 | 527687 | 6437681 | 11 | -2 | 11 | -81 | DM | (Raw Nav, Kongsberg 14208, img#28) (B) |
| 20-Mar-2023 | 13:24:31 | 668 | ECR_ENV_40 | | | camera | 71 | 527695 | 6437678 | 527687 | 6437681 | 8 | -3 | 8 | -70 | DM | (Raw Nav, Kongsberg 14208, img#29) (B) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 20-Mar-2023 | 13:25:13 | 669 | ECR_ENV_40 | | | camera | 70 | 527689 | 6437677 | 527687 | 6437681 | 2 | -4 | 4 | -26 | DM | (Raw Nav, Kongsberg 14208, img#30) (B) |
| 20-Mar-2023 | 13:26:29 | 670 | ECR_ENV_40 | | | camera | 70 | 527675 | 6437683 | 527687 | 6437681 | -12 | 2 | 12 | 100 | DM | (Raw Nav, Kongsberg 14208, img#31) (B) |
| 20-Mar-2023 | 13:27:07 | 671 | ECR_ENV_40 | | | camera | 70 | 527672 | 6437678 | 527687 | 6437681 | -15 | -3 | 15 | 80 | DM | (Raw Nav, Kongsberg 14208, img#32) (B) |
| 20-Mar-2023 | 13:27:51 | 672 | ECR_ENV_40 | | | camera | 70 | 527670 | 6437671 | 527687 | 6437681 | -17 | -10 | 20 | 60 | DM | (Raw Nav, Kongsberg 14208, img#33) (B) |
| 20-Mar-2023 | 13:28:24 | 673 | ECR_ENV_40 | | | camera | 70 | 527674 | 6437665 | 527687 | 6437681 | -13 | -16 | 21 | 40 | DM | (Raw Nav, Kongsberg 14208, img#34) (B) |
| 20-Mar-2023 | 13:28:50 | 674 | ECR_ENV_40 | | | camera | 71 | 527679 | 6437661 | 527687 | 6437681 | -8 | -20 | 21 | 23 | DM | (Raw Nav, Kongsberg 14208, img#35) (B) |
| 20-Mar-2023 | 13:29:26 | 675 | ECR_ENV_40 | | | camera | 70 | 527685 | 6437655 | 527687 | 6437681 | -2 | -26 | 26 | 5 | DM | (Raw Nav, Kongsberg 14208, img#36) (B) |
| 20-Mar-2023 | 13:30:22 | 676 | ECR_ENV_40 | | | camera | 70 | 527702 | 6437661 | 527687 | 6437681 | 15 | -20 | 25 | -37 | DM | (Raw Nav, Kongsberg 14208, img#37) (B) |
| 20-Mar-2023 | 13:30:36 | 677 | ECR_ENV_40 | | | camera | 70 | 527707 | 6437663 | 527687 | 6437681 | 20 | -18 | 27 | -48 | DM | (Raw Nav, Kongsberg 14208, img#38) (B) |
| 20-Mar-2023 | 13:30:58 | 678 | ECR_ENV_40 | | | camera | 70 | 527713 | 6437663 | 527687 | 6437681 | 26 | -18 | 31 | -55 | DM | (Raw Nav, Kongsberg 14208, img#39) (B) |
| 20-Mar-2023 | 13:31:14 | 679 | ECR_ENV_40 | | | camera | 70 | 527717 | 6437663 | 527687 | 6437681 | 30 | -18 | 35 | -59 | DM | (Raw Nav, Kongsberg 14208, img#40) (B) |
| 20-Mar-2023 | 13:31:24 | 680 | ECR_ENV_40 | | | camera | 70 | 527723 | 6437664 | 527687 | 6437681 | 36 | -17 | 40 | -65 | DM | (Raw Nav, Kongsberg 14208, img#41) (B) |
| 20-Mar-2023 | 13:31:31 | 681 | ECR_ENV_40 | | | camera | 70 | 527728 | 6437665 | 527687 | 6437681 | 41 | -16 | 44 | -69 | DM | (Raw Nav, Kongsberg 14208, img#42) (B) |
| 29-Mar-2023 | 15:49:50 | 682 | ECR_ENV_08 | | | camera | 72 | 526589 | 6398039 | 526625 | 6398004 | -36 | 36 | 51 | 135 | SG | (Corr'd Nav, Kongsberg 14208, img#1) (V) (T.A) |
| 29-Mar-2023 | 15:50:02 | 683 | ECR_ENV_08 | | | camera | 72 | 526591 | 6398039 | 526625 | 6398004 | -34 | 35 | 49 | 135 | SG | (Corr'd Nav, Kongsberg 14208, img#2) (V) (T.A) |
| 29-Mar-2023 | 15:50:19 | 684 | ECR_ENV_08 | | | camera | 72 | 526594 | 6398039 | 526625 | 6398004 | -32 | 35 | 47 | 138 | SG | (Corr'd Nav, Kongsberg 14208, img#3) (V) (T.A) |
| 29-Mar-2023 | 15:50:35 | 685 | ECR_ENV_08 | | | camera | 72 | 526596 | 6398039 | 526625 | 6398004 | -29 | 35 | 45 | 140 | SG | (Corr'd Nav, Kongsberg 14208, img#4) (V) (T.A) |
| 29-Mar-2023 | 15:50:43 | 686 | ECR_ENV_08 | | | camera | 72 | 526596 | 6398038 | 526625 | 6398004 | -29 | 34 | 44 | 140 | SG | (Corr'd Nav, Kongsberg 14208, img#5) (V) (T.A) |
| 29-Mar-2023 | 15:51:04 | 687 | ECR_ENV_08 | | | camera | 72 | 526596 | 6398035 | 526625 | 6398004 | -29 | 32 | 43 | 138 | SG | (Corr'd Nav, Kongsberg 14208, img#6) (V) (T.A) |
| 29-Mar-2023 | 15:51:19 | 688 | ECR_ENV_08 | | | camera | 72 | 526597 | 6398034 | 526625 | 6398004 | -29 | 30 | 41 | 136 | SG | (Corr'd Nav, Kongsberg 14208, img#7) (V) (T.A) |
| 29-Mar-2023 | 15:51:30 | 689 | ECR_ENV_08 | | | camera | 72 | 526598 | 6398033 | 526625 | 6398004 | -27 | 29 | 40 | 137 | SG | (Corr'd Nav, Kongsberg 14208, img#8) (V) (T.A) |
| 29-Mar-2023 | 15:51:46 | 690 | ECR_ENV_08 | | | camera | 72 | 526600 | 6398032 | 526625 | 6398004 | -25 | 28 | 38 | 139 | SG | (Corr'd Nav, Kongsberg 14208, img#9) (V) (T.A) |
| 29-Mar-2023 | 15:52:02 | 691 | ECR_ENV_08 | | | camera | 72 | 526603 | 6398032 | 526625 | 6398004 | -22 | 28 | 35 | 142 | SG | (Corr'd Nav, Kongsberg 14208, img#10) (V) (T.A) |
| 29-Mar-2023 | 15:52:15 | 692 | ECR_ENV_08 | | | camera | 72 | 526605 | 6398032 | 526625 | 6398004 | -20 | 28 | 35 | 144 | SG | (Corr'd Nav, Kongsberg 14208, img#11) (V) (T.A) |
| 29-Mar-2023 | 15:52:34 | 693 | ECR_ENV_08 | | | camera | 72 | 526606 | 6398033 | 526625 | 6398004 | -19 | 29 | 34 | 147 | SG | (Corr'd Nav, Kongsberg 14208, img#12) (V) (T.A) |
| 29-Mar-2023 | 15:53:09 | 694 | ECR_ENV_08 | | | camera | 72 | 526603 | 6398030 | 526625 | 6398004 | -22 | 26 | 34 | 140 | SG | (Corr'd Nav, Kongsberg 14208, img#13) (V) (T.A) |
| 29-Mar-2023 | 15:54:12 | 695 | ECR_ENV_08 | | | camera | 71 | 526606 | 6398026 | 526625 | 6398004 | -19 | 22 | 29 | 139 | SG | (Corr'd Nav, Kongsberg 14208, img#14) (V) (T.A) |
| 29-Mar-2023 | 15:54:27 | 696 | ECR_ENV_08 | | | camera | 71 | 526608 | 6398024 | 526625 | 6398004 | -17 | 21 | 26 | 141 | SG | (Corr'd Nav, Kongsberg 14208, img#15) (V) (T.A) |
| 29-Mar-2023 | 15:54:36 | 697 | ECR_ENV_08 | | | camera | 71 | 526610 | 6398024 | 526625 | 6398004 | -15 | 20 | 25 | 142 | SG | (Corr'd Nav, Kongsberg 14208, img#16) (V) (T.A) |
| 29-Mar-2023 | 15:55:07 | 698 | ECR_ENV_08 | | | camera | 71 | 526610 | 6398021 | 526625 | 6398004 | -15 | 17 | 23 | 139 | SG | (Corr'd Nav, Kongsberg 14208, img#17) (V) (T.A) |
| 29-Mar-2023 | 15:55:31 | 699 | ECR_ENV_08 | | | camera | 71 | 526612 | 6398018 | 526625 | 6398004 | -13 | 14 | 19 | 136 | SG | (Corr'd Nav, Kongsberg 14208, img#18) (V) (T.A) |
| 29-Mar-2023 | 15:56:19 | 700 | ECR_ENV_08 | | | camera | 71 | 526616 | 6398017 | 526625 | 6398004 | -9 | 13 | 16 | 145 | SG | (Corr'd Nav, Kongsberg 14208, img#19) (V) (T.A) |
| 29-Mar-2023 | 15:56:52 | 701 | ECR_ENV_08 | | | camera | 71 | 526618 | 6398013 | 526625 | 6398004 | -7 | 9 | 12 | 143 | SG | (Corr'd Nav, Kongsberg 14208, img#20) (V) (T.A) |
| 29-Mar-2023 | 15:57:10 | 702 | ECR_ENV_08 | | | camera | 71 | 526619 | 6398011 | 526625 | 6398004 | -6 | 7 | 9 | 141 | SG | (Corr'd Nav, Kongsberg 14208, img#21) (V) (T.A) |
| 29-Mar-2023 | 15:57:44 | 703 | ECR_ENV_08 | | | camera | 71 | 526620 | 6398011 | 526625 | 6398004 | -5 | 7 | 9 | 142 | SG | (Corr'd Nav, Kongsberg 14208, img#22) (V) (T.A) |
| 29-Mar-2023 | 15:58:43 | 704 | ECR_ENV_08 | | | camera | 71 | 526623 | 6398006 | 526625 | 6398004 | -2 | 2 | 3 | 129 | SG | (Corr'd Nav, Kongsberg 14208, img#23) (V) (T.A) |
| 29-Mar-2023 | 15:58:54 | 705 | ECR_ENV_08 | | | camera | 71 | 526624 | 6398005 | 526625 | 6398004 | -1 | 1 | 1 | 143 | SG | (Corr'd Nav, Kongsberg 14208, img#24) (V) (T.A) |
| 29-Mar-2023 | 15:59:02 | 706 | ECR_ENV_08 | | | camera | 71 | 526625 | 6398005 | 526625 | 6398004 | 0 | 1 | 1 | 170 | SG | (Corr'd Nav, Kongsberg 14208, img#25) (V) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | | Vertical / Tidal Datum | VORF, LAT | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 29-Mar-2023 | 15:59:54 | 707 | ECR_ENV_08 | | | camera | 71 | 526626 | 6398000 | 526625 | 6398004 | 1 | -4 | 4 | -9 | SG | (Corr'd Nav, Kongsberg 14208, img#26) (V) (T.A) |
| 29-Mar-2023 | 16:00:13 | 708 | ECR_ENV_08 | | | camera | 71 | 526629 | 6397999 | 526625 | 6398004 | 3 | -5 | 6 | -35 | SG | (Corr'd Nav, Kongsberg 14208, img#27) (V) (T.A) |
| 29-Mar-2023 | 16:00:39 | 709 | ECR_ENV_08 | | | camera | 71 | 526630 | 6397999 | 526625 | 6398004 | 5 | -5 | 7 | -41 | SG | (Corr'd Nav, Kongsberg 14208, img#28) (V) (T.A) |
| 29-Mar-2023 | 16:01:15 | 710 | ECR_ENV_08 | | | camera | 71 | 526632 | 6397996 | 526625 | 6398004 | 7 | -8 | 10 | -40 | SG | (Corr'd Nav, Kongsberg 14208, img#29) (V) (T.A) |
| 29-Mar-2023 | 16:01:40 | 711 | ECR_ENV_08 | | | camera | 71 | 526635 | 6397995 | 526625 | 6398004 | 9 | -9 | 13 | -46 | SG | (Corr'd Nav, Kongsberg 14208, img#30) (V) (T.A) |
| 29-Mar-2023 | 16:02:13 | 712 | ECR_ENV_08 | | | camera | 71 | 526637 | 6397991 | 526625 | 6398004 | 12 | -13 | 18 | -42 | SG | (Corr'd Nav, Kongsberg 14208, img#31) (V) (T.A) |
| 29-Mar-2023 | 16:02:28 | 713 | ECR_ENV_08 | | | camera | 71 | 526639 | 6397990 | 526625 | 6398004 | 14 | -14 | 20 | -44 | SG | (Corr'd Nav, Kongsberg 14208, img#32) (V) (T.A) |
| 29-Mar-2023 | 16:02:54 | 714 | ECR_ENV_08 | | | camera | 71 | 526641 | 6397990 | 526625 | 6398004 | 16 | -14 | 21 | -50 | SG | (Corr'd Nav, Kongsberg 14208, img#33) (V) (T.A) |
| 29-Mar-2023 | 16:03:21 | 715 | ECR_ENV_08 | | | camera | 71 | 526645 | 6397990 | 526625 | 6398004 | 20 | -14 | 24 | -56 | SG | (Corr'd Nav, Kongsberg 14208, img#34) (V) (T.A) |
| 29-Mar-2023 | 16:03:35 | 716 | ECR_ENV_08 | | | camera | 71 | 526646 | 6397990 | 526625 | 6398004 | 21 | -14 | 26 | -56 | SG | (Corr'd Nav, Kongsberg 14208, img#35) (V) (T.A) |
| 29-Mar-2023 | 16:03:50 | 717 | ECR_ENV_08 | | | camera | 71 | 526648 | 6397988 | 526625 | 6398004 | 22 | -16 | 27 | -55 | SG | (Corr'd Nav, Kongsberg 14208, img#36) (V) (T.A) |
| 29-Mar-2023 | 16:03:59 | 718 | ECR_ENV_08 | | | camera | 71 | 526648 | 6397987 | 526625 | 6398004 | 23 | -17 | 29 | -54 | SG | (Corr'd Nav, Kongsberg 14208, img#37) (V) (T.A) |
| 29-Mar-2023 | 16:04:15 | 719 | ECR_ENV_08 | | | camera | 71 | 526650 | 6397985 | 526625 | 6398004 | 25 | -19 | 31 | -53 | SG | (Corr'd Nav, Kongsberg 14208, img#38) (V) (T.A) |
| 29-Mar-2023 | 16:05:02 | 720 | ECR_ENV_08 | | | camera | 71 | 526654 | 6397985 | 526625 | 6398004 | 29 | -19 | 35 | -56 | SG | (Corr'd Nav, Kongsberg 14208, img#39) (V) (T.A) |
| 29-Mar-2023 | 16:05:19 | 721 | ECR_ENV_08 | | | camera | 71 | 526654 | 6397983 | 526625 | 6398004 | 29 | -21 | 36 | -54 | SG | (Corr'd Nav, Kongsberg 14208, img#40) (V) (T.A) |
| 29-Mar-2023 | 16:05:43 | 722 | ECR_ENV_08 | | | camera | 71 | 526654 | 6397980 | 526625 | 6398004 | 29 | -24 | 37 | -51 | SG | (Corr'd Nav, Kongsberg 14208, img#41) (V) (T.A) |
| 29-Mar-2023 | 16:06:21 | 723 | ECR_ENV_08 | | | camera | 71 | 526655 | 6397976 | 526625 | 6398004 | 30 | -28 | 41 | -47 | SG | (Corr'd Nav, Kongsberg 14208, img#42) (V) (T.A) |
| 29-Mar-2023 | 16:06:44 | 724 | ECR_ENV_08 | | | camera | 71 | 526659 | 6397975 | 526625 | 6398004 | 34 | -29 | 45 | -49 | SG | (Corr'd Nav, Kongsberg 14208, img#43) (V) (T.A) |
| 29-Mar-2023 | 16:07:09 | 725 | ECR_ENV_08 | | | camera | 71 | 526661 | 6397975 | 526625 | 6398004 | 36 | -29 | 46 | -52 | SG | (Corr'd Nav, Kongsberg 14208, img#44) (V) (T.A) |
| 29-Mar-2023 | 16:07:43 | 726 | ECR_ENV_08 | | | camera | 71 | 526664 | 6397974 | 526625 | 6398004 | 39 | -30 | 49 | -53 | PL | (Corr'd Nav, Kongsberg 14208, img#45) (V) (T.A) |
| 30-Mar-2023 | 02:56:35 | 727 | ECR_ENV_15 | | | camera | 49 | 524593 | 6397521 | 524538 | 6397554 | 55 | -33 | 64 | -59 | PL | (Corr'd Nav, Kongsberg 14208, img#1) (V) (T.A) |
| 30-Mar-2023 | 02:56:42 | 728 | ECR_ENV_15 | | | camera | 49 | 524592 | 6397522 | 524538 | 6397554 | 54 | -32 | 63 | -59 | PL | (Corr'd Nav, Kongsberg 14208, img#2) (V) (T.A) |
| 30-Mar-2023 | 02:56:54 | 729 | ECR_ENV_15 | | | camera | 49 | 524590 | 6397523 | 524538 | 6397554 | 52 | -31 | 60 | -60 | PL | (Corr'd Nav, Kongsberg 14208, img#3) (V) (T.A) |
| 30-Mar-2023 | 02:57:53 | 730 | ECR_ENV_15 | | | camera | 49 | 524584 | 6397528 | 524538 | 6397554 | 45 | -26 | 52 | -60 | PL | (Corr'd Nav, Kongsberg 14208, img#4) (V) (T.A) |
| 30-Mar-2023 | 02:58:04 | 731 | ECR_ENV_15 | | | camera | 49 | 524583 | 6397528 | 524538 | 6397554 | 44 | -25 | 51 | -60 | PL | (Corr'd Nav, Kongsberg 14208, img#5) (V) (T.A) |
| 30-Mar-2023 | 02:58:11 | 732 | ECR_ENV_15 | | | camera | 49 | 524582 | 6397529 | 524538 | 6397554 | 43 | -25 | 50 | -60 | PL | (Corr'd Nav, Kongsberg 14208, img#6) (V) (T.A) |
| 30-Mar-2023 | 02:58:26 | 733 | ECR_ENV_15 | | | camera | 49 | 524580 | 6397531 | 524538 | 6397554 | 41 | -23 | 47 | -60 | PL | (Corr'd Nav, Kongsberg 14208, img#7) (V) (T.A) |
| 30-Mar-2023 | 02:58:33 | 734 | ECR_ENV_15 | | | camera | 49 | 524579 | 6397531 | 524538 | 6397554 | 40 | -23 | 46 | -61 | PL | (Corr'd Nav, Kongsberg 14208, img#8) (V) (T.A) |
| 30-Mar-2023 | 02:58:46 | 735 | ECR_ENV_15 | | | camera | 49 | 524577 | 6397532 | 524538 | 6397554 | 39 | -22 | 45 | -61 | PL | (Corr'd Nav, Kongsberg 14208, img#9) (V) (T.A) |
| 30-Mar-2023 | 02:59:11 | 736 | ECR_ENV_15 | | | camera | 49 | 524575 | 6397535 | 524538 | 6397554 | 37 | -19 | 41 | -63 | PL | (Corr'd Nav, Kongsberg 14208, img#10) (V) (T.A) |
| 30-Mar-2023 | 02:59:25 | 737 | ECR_ENV_15 | | | camera | 49 | 524574 | 6397536 | 524538 | 6397554 | 35 | -17 | 39 | -64 | PL | (Corr'd Nav, Kongsberg 14208, img#11) (V) (T.A) |
| 30-Mar-2023 | 02:59:41 | 738 | ECR_ENV_15 | | | camera | 49 | 524572 | 6397538 | 524538 | 6397554 | 33 | -16 | 37 | -65 | PL | (Corr'd Nav, Kongsberg 14208, img#12) (V) (T.A) |
| 30-Mar-2023 | 03:00:17 | 739 | ECR_ENV_15 | | | camera | 49 | 524568 | 6397541 | 524538 | 6397554 | 30 | -13 | 32 | -66 | PL | (Corr'd Nav, Kongsberg 14208, img#13) (V) (T.A) |
| 30-Mar-2023 | 03:00:24 | 740 | ECR_ENV_15 | | | camera | 49 | 524567 | 6397542 | 524538 | 6397554 | 29 | -12 | 31 | -67 | PL | (Corr'd Nav, Kongsberg 14208, img#14) (V) (T.A) |
| 30-Mar-2023 | 03:01:02 | 741 | ECR_ENV_15 | | | camera | 49 | 524563 | 6397544 | 524538 | 6397554 | 24 | -10 | 26 | -68 | PL | (Corr'd Nav, Kongsberg 14208, img#15) (V) (T.A) |
| 30-Mar-2023 | 03:01:15 | 742 | ECR_ENV_15 | | | camera | 50 | 524561 | 6397545 | 524538 | 6397554 | 22 | -9 | 24 | -69 | PL | (Corr'd Nav, Kongsberg 14208, img#16) (V) (T.A) |
| 30-Mar-2023 | 03:01:46 | 743 | ECR_ENV_15 | | | camera | 50 | 524557 | 6397547 | 524538 | 6397554 | 19 | -7 | 20 | -71 | PL | (Corr'd Nav, Kongsberg 14208, img#17) (V) (T.A) |
| 30-Mar-2023 | 03:02:01 | 744 | ECR_ENV_15 | | | camera | 50 | 524555 | 6397549 | 524538 | 6397554 | 17 | -5 | 17 | -74 | PL | (Corr'd Nav, Kongsberg 14208, img#18) (V) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | | Vessel | MV *Ocean Endeavour* | | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | | Vessel Reference Point (VRP) | COG | | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 | |
| Primary Positioning System | Starpack 1 | | | | Actual Coordinates derived from | Vessel | | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | | Projection | UTM zone 30N | | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 30-Mar-2023 | 03:02:25 | 745 | ECR_ENV_15 | | | camera | 50 | 524553 | 6397550 | 524538 | 6397554 | 15 | -4 | 15 | -74 | PL | (Corr'd Nav, Kongsberg 14208, img#19) (V) (T.A) |
| 30-Mar-2023 | 03:02:46 | 746 | ECR_ENV_15 | | | camera | 50 | 524551 | 6397550 | 524538 | 6397554 | 12 | -4 | 13 | -73 | PL | (Corr'd Nav, Kongsberg 14208, img#20) (V) (T.A) |
| 30-Mar-2023 | 03:02:53 | 747 | ECR_ENV_15 | | | camera | 50 | 524550 | 6397551 | 524538 | 6397554 | 11 | -3 | 12 | -74 | PL | (Corr'd Nav, Kongsberg 14208, img#21) (V) (T.A) |
| 30-Mar-2023 | 03:03:11 | 748 | ECR_ENV_15 | | | camera | 50 | 524547 | 6397552 | 524538 | 6397554 | 9 | -2 | 9 | -79 | PL | (Corr'd Nav, Kongsberg 14208, img#22) (V) (T.A) |
| 30-Mar-2023 | 03:03:24 | 749 | ECR_ENV_15 | | | camera | 50 | 524546 | 6397552 | 524538 | 6397554 | 7 | -2 | 7 | -78 | PL | (Corr'd Nav, Kongsberg 14208, img#23) (V) (T.A) |
| 30-Mar-2023 | 03:03:46 | 750 | ECR_ENV_15 | | | camera | 50 | 524542 | 6397553 | 524538 | 6397554 | 3 | -1 | 3 | -73 | PL | (Corr'd Nav, Kongsberg 14208, img#24) (V) (T.A) |
| 30-Mar-2023 | 03:04:11 | 751 | ECR_ENV_15 | | | camera | 50 | 524539 | 6397554 | 524538 | 6397554 | 0 | 0 | 0 | -166 | PL | (Corr'd Nav, Kongsberg 14208, img#25) (V) (T.A) |
| 30-Mar-2023 | 03:04:24 | 752 | ECR_ENV_15 | | | camera | 50 | 524538 | 6397556 | 524538 | 6397554 | -1 | 2 | 2 | 159 | PL | (Corr'd Nav, Kongsberg 14208, img#26) (V) (T.A) |
| 30-Mar-2023 | 03:04:54 | 753 | ECR_ENV_15 | | | camera | 50 | 524536 | 6397559 | 524538 | 6397554 | -3 | 5 | 6 | 150 | PL | (Corr'd Nav, Kongsberg 14208, img#27) (V) (T.A) |
| 30-Mar-2023 | 03:05:02 | 754 | ECR_ENV_15 | | | camera | 50 | 524535 | 6397560 | 524538 | 6397554 | -4 | 6 | 7 | 150 | PL | (Corr'd Nav, Kongsberg 14208, img#28) (V) (T.A) |
| 30-Mar-2023 | 03:05:22 | 755 | ECR_ENV_15 | | | camera | 50 | 524534 | 6397562 | 524538 | 6397554 | -5 | 8 | 9 | 148 | PL | (Corr'd Nav, Kongsberg 14208, img#29) (V) (T.A) |
| 30-Mar-2023 | 03:05:48 | 756 | ECR_ENV_15 | | | camera | 49 | 524532 | 6397565 | 524538 | 6397554 | -7 | 11 | 13 | 150 | PL | (Corr'd Nav, Kongsberg 14208, img#30) (V) (T.A) |
| 30-Mar-2023 | 03:06:07 | 757 | ECR_ENV_15 | | | camera | 49 | 524531 | 6397567 | 524538 | 6397554 | -8 | 13 | 15 | 150 | PL | (Corr'd Nav, Kongsberg 14208, img#31) (V) (T.A) |
| 30-Mar-2023 | 03:06:16 | 758 | ECR_ENV_15 | | | camera | 50 | 524530 | 6397569 | 524538 | 6397554 | -9 | 15 | 17 | 150 | PL | (Corr'd Nav, Kongsberg 14208, img#32) (V) (T.A) |
| 30-Mar-2023 | 03:06:29 | 759 | ECR_ENV_15 | | | camera | 50 | 524529 | 6397571 | 524538 | 6397554 | -10 | 17 | 19 | 150 | PL | (Corr'd Nav, Kongsberg 14208, img#33) (V) (T.A) |
| 30-Mar-2023 | 03:06:40 | 760 | ECR_ENV_15 | | | camera | 50 | 524528 | 6397572 | 524538 | 6397554 | -10 | 18 | 21 | 150 | PL | (Corr'd Nav, Kongsberg 14208, img#34) (V) (T.A) |
| 30-Mar-2023 | 03:06:47 | 761 | ECR_ENV_15 | | | camera | 50 | 524528 | 6397572 | 524538 | 6397554 | -11 | 19 | 21 | 150 | PL | (Corr'd Nav, Kongsberg 14208, img#35) (V) (T.A) |
| 30-Mar-2023 | 03:07:14 | 762 | ECR_ENV_15 | | | camera | 49 | 524524 | 6397575 | 524538 | 6397554 | -15 | 21 | 26 | 145 | PL | (Corr'd Nav, Kongsberg 14208, img#36) (V) (T.A) |
| 30-Mar-2023 | 03:07:37 | 763 | ECR_ENV_15 | | | camera | 49 | 524521 | 6397576 | 524538 | 6397554 | -17 | 22 | 28 | 141 | PL | (Corr'd Nav, Kongsberg 14208, img#37) (V) (T.A) |
| 30-Mar-2023 | 03:07:55 | 764 | ECR_ENV_15 | | | camera | 49 | 524519 | 6397577 | 524538 | 6397554 | -20 | 23 | 30 | 139 | PL | (Corr'd Nav, Kongsberg 14208, img#38) (V) (T.A) |
| 30-Mar-2023 | 03:08:17 | 765 | ECR_ENV_15 | | | camera | 49 | 524516 | 6397579 | 524538 | 6397554 | -23 | 25 | 34 | 138 | PL | (Corr'd Nav, Kongsberg 14208, img#39) (V) (T.A) |
| 30-Mar-2023 | 03:08:24 | 766 | ECR_ENV_15 | | | camera | 49 | 524515 | 6397579 | 524538 | 6397554 | -23 | 26 | 35 | 138 | PL | (Corr'd Nav, Kongsberg 14208, img#40) (V) (T.A) |
| 30-Mar-2023 | 03:08:42 | 767 | ECR_ENV_15 | | | camera | 49 | 524514 | 6397581 | 524538 | 6397554 | -25 | 27 | 37 | 138 | PL | (Corr'd Nav, Kongsberg 14208, img#41) (V) (T.A) |
| 30-Mar-2023 | 03:09:06 | 768 | ECR_ENV_15 | | | camera | 49 | 524513 | 6397586 | 524538 | 6397554 | -26 | 32 | 41 | 141 | PL | (Corr'd Nav, Kongsberg 14208, img#42) (V) (T.A) |
| 30-Mar-2023 | 03:09:52 | 769 | ECR_ENV_15 | | | camera | 49 | 524508 | 6397590 | 524538 | 6397554 | -30 | 36 | 47 | 140 | PL | (Corr'd Nav, Kongsberg 14208, img#43) (V) (T.A) |
| 30-Mar-2023 | 04:50:42 | 770 | ECR_ENV_20 | | | camera | 29 | 522072 | 6396358 | 522015 | 6396359 | 57 | -1 | 57 | -89 | PL | (Corr'd Nav, Kongsberg 14208, img#1) (V) (T.A) |
| 30-Mar-2023 | 04:51:00 | 771 | ECR_ENV_20 | | | camera | 29 | 522072 | 6396359 | 522015 | 6396359 | 57 | 0 | 57 | -90 | PL | (Corr'd Nav, Kongsberg 14208, img#2) (V) (T.A) |
| 30-Mar-2023 | 04:51:49 | 772 | ECR_ENV_20 | | | camera | 29 | 522074 | 6396358 | 522015 | 6396359 | 59 | -1 | 59 | -89 | PL | (Corr'd Nav, Kongsberg 14208, img#3) (V) (T.A) |
| 30-Mar-2023 | 04:51:57 | 773 | ECR_ENV_20 | | | camera | 29 | 522074 | 6396357 | 522015 | 6396359 | 59 | -2 | 59 | -88 | PL | (Corr'd Nav, Kongsberg 14208, img#4) (V) (T.A) |
| 30-Mar-2023 | 04:52:35 | 774 | ECR_ENV_20 | | | camera | 29 | 522069 | 6396358 | 522015 | 6396359 | 53 | -1 | 53 | -89 | PL | (Corr'd Nav, Kongsberg 14208, img#5) (V) (T.A) |
| 30-Mar-2023 | 04:52:48 | 775 | ECR_ENV_20 | | | camera | 29 | 522067 | 6396357 | 522015 | 6396359 | 51 | -2 | 51 | -88 | PL | (Corr'd Nav, Kongsberg 14208, img#6) (V) (T.A) |
| 30-Mar-2023 | 04:53:10 | 776 | ECR_ENV_20 | | | camera | 29 | 522064 | 6396356 | 522015 | 6396359 | 49 | -3 | 49 | -87 | PL | (Corr'd Nav, Kongsberg 14208, img#7) (V) (T.A) |
| 30-Mar-2023 | 04:53:27 | 777 | ECR_ENV_20 | | | camera | 29 | 522061 | 6396355 | 522015 | 6396359 | 45 | -4 | 46 | -85 | PL | (Corr'd Nav, Kongsberg 14208, img#8) (V) (T.A) |
| 30-Mar-2023 | 04:53:34 | 778 | ECR_ENV_20 | | | camera | 29 | 522060 | 6396355 | 522015 | 6396359 | 44 | -4 | 44 | -85 | PL | (Corr'd Nav, Kongsberg 14208, img#9) (V) (T.A) |
| 30-Mar-2023 | 04:53:51 | 779 | ECR_ENV_20 | | | camera | 29 | 522057 | 6396354 | 522015 | 6396359 | 42 | -5 | 42 | -83 | PL | (Corr'd Nav, Kongsberg 14208, img#10) (V) (T.A) |
| 30-Mar-2023 | 04:53:58 | 780 | ECR_ENV_20 | | | camera | 29 | 522056 | 6396354 | 522015 | 6396359 | 41 | -6 | 41 | -82 | PL | (Corr'd Nav, Kongsberg 14208, img#11) (V) (T.A) |
| 30-Mar-2023 | 04:54:05 | 781 | ECR_ENV_20 | | | camera | 29 | 522055 | 6396354 | 522015 | 6396359 | 39 | -5 | 40 | -82 | PL | (Corr'd Nav, Kongsberg 14208, img#12) (V) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | | Vertical / Tidal Datum | VORF, LAT | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 30-Mar-2023 | 04:54:22 | 782 | ECR_ENV_20 | | | camera | 29 | 522053 | 6396355 | 522015 | 6396359 | 38 | -4 | 38 | -84 | PL | (Corr'd Nav, Kongsberg 14208, img#13) (V) (T.A) |
| 30-Mar-2023 | 04:54:47 | 783 | ECR_ENV_20 | | | camera | 29 | 522050 | 6396357 | 522015 | 6396359 | 35 | -2 | 35 | -87 | PL | (Corr'd Nav, Kongsberg 14208, img#14) (V) (T.A) |
| 30-Mar-2023 | 04:54:57 | 784 | ECR_ENV_20 | | | camera | 29 | 522049 | 6396357 | 522015 | 6396359 | 34 | -2 | 34 | -87 | PL | (Corr'd Nav, Kongsberg 14208, img#15) (V) (T.A) |
| 30-Mar-2023 | 04:55:16 | 785 | ECR_ENV_20 | | | camera | 29 | 522046 | 6396358 | 522015 | 6396359 | 30 | -1 | 30 | -87 | PL | (Corr'd Nav, Kongsberg 14208, img#16) (V) (T.A) |
| 30-Mar-2023 | 04:55:26 | 786 | ECR_ENV_20 | | | camera | 29 | 522044 | 6396357 | 522015 | 6396359 | 29 | -2 | 29 | -87 | PL | (Corr'd Nav, Kongsberg 14208, img#17) (V) (T.A) |
| 30-Mar-2023 | 04:55:42 | 787 | ECR_ENV_20 | | | camera | 29 | 522042 | 6396357 | 522015 | 6396359 | 27 | -2 | 27 | -85 | PL | (Corr'd Nav, Kongsberg 14208, img#18) (V) (T.A) |
| 30-Mar-2023 | 04:56:20 | 788 | ECR_ENV_20 | | | camera | 29 | 522037 | 6396356 | 522015 | 6396359 | 22 | -3 | 22 | -83 | PL | (Corr'd Nav, Kongsberg 14208, img#19) (V) (T.A) |
| 30-Mar-2023 | 04:56:31 | 789 | ECR_ENV_20 | | | camera | 29 | 522035 | 6396357 | 522015 | 6396359 | 20 | -2 | 20 | -83 | PL | (Corr'd Nav, Kongsberg 14208, img#20) (V) (T.A) |
| 30-Mar-2023 | 04:56:49 | 790 | ECR_ENV_20 | | | camera | 29 | 522033 | 6396356 | 522015 | 6396359 | 17 | -3 | 18 | -82 | PL | (Corr'd Nav, Kongsberg 14208, img#21) (V) (T.A) |
| 30-Mar-2023 | 04:57:12 | 791 | ECR_ENV_20 | | | camera | 29 | 522030 | 6396357 | 522015 | 6396359 | 14 | -2 | 14 | -83 | PL | (Corr'd Nav, Kongsberg 14208, img#22) (V) (T.A) |
| 30-Mar-2023 | 04:57:18 | 792 | ECR_ENV_20 | | | camera | 29 | 522029 | 6396357 | 522015 | 6396359 | 14 | -2 | 14 | -83 | PL | (Corr'd Nav, Kongsberg 14208, img#23) (V) (T.A) |
| 30-Mar-2023 | 04:57:55 | 793 | ECR_ENV_20 | | | camera | 29 | 522023 | 6396357 | 522015 | 6396359 | 7 | -2 | 8 | -75 | PL | (Corr'd Nav, Kongsberg 14208, img#24) (V) (T.A) |
| 30-Mar-2023 | 04:58:09 | 794 | ECR_ENV_20 | | | camera | 29 | 522021 | 6396356 | 522015 | 6396359 | 5 | -3 | 6 | -64 | PL | (Corr'd Nav, Kongsberg 14208, img#25) (V) (T.A) |
| 30-Mar-2023 | 04:58:44 | 795 | ECR_ENV_20 | | | camera | 29 | 522016 | 6396358 | 522015 | 6396359 | 1 | -1 | 1 | -21 | PL | (Corr'd Nav, Kongsberg 14208, img#26) (V) (T.A) |
| 30-Mar-2023 | 04:59:00 | 796 | ECR_ENV_20 | | | camera | 29 | 522014 | 6396359 | 522015 | 6396359 | -1 | 0 | 1 | 92 | PL | (Corr'd Nav, Kongsberg 14208, img#27) (V) (T.A) |
| 30-Mar-2023 | 04:59:18 | 797 | ECR_ENV_20 | | | camera | 29 | 522011 | 6396359 | 522015 | 6396359 | -4 | 0 | 4 | 95 | PL | (Corr'd Nav, Kongsberg 14208, img#28) (V) (T.A) |
| 30-Mar-2023 | 04:59:42 | 798 | ECR_ENV_20 | | | camera | 28 | 522007 | 6396359 | 522015 | 6396359 | -8 | 0 | 8 | 92 | PL | (Corr'd Nav, Kongsberg 14208, img#29) (V) (T.A) |
| 30-Mar-2023 | 05:00:14 | 799 | ECR_ENV_20 | | | camera | 29 | 522004 | 6396360 | 522015 | 6396359 | -12 | 1 | 12 | 94 | PL | (Corr'd Nav, Kongsberg 14208, img#30) (V) (T.A) |
| 30-Mar-2023 | 05:00:29 | 800 | ECR_ENV_20 | | | camera | 29 | 522002 | 6396361 | 522015 | 6396359 | -13 | 2 | 14 | 100 | PL | (Corr'd Nav, Kongsberg 14208, img#31) (V) (T.A) |
| 30-Mar-2023 | 05:00:49 | 801 | ECR_ENV_20 | | | camera | 28 | 521998 | 6396362 | 522015 | 6396359 | -17 | 3 | 17 | 100 | PL | (Corr'd Nav, Kongsberg 14208, img#32) (V) (T.A) |
| 30-Mar-2023 | 05:00:56 | 802 | ECR_ENV_20 | | | camera | 29 | 521997 | 6396362 | 522015 | 6396359 | -18 | 3 | 19 | 100 | PL | (Corr'd Nav, Kongsberg 14208, img#33) (V) (T.A) |
| 30-Mar-2023 | 05:01:03 | 803 | ECR_ENV_20 | | | camera | 28 | 521996 | 6396362 | 522015 | 6396359 | -20 | 3 | 20 | 98 | PL | (Corr'd Nav, Kongsberg 14208, img#34) (V) (T.A) |
| 30-Mar-2023 | 05:01:12 | 804 | ECR_ENV_20 | | | camera | 28 | 521994 | 6396361 | 522015 | 6396359 | -22 | 2 | 22 | 95 | PL | (Corr'd Nav, Kongsberg 14208, img#35) (V) (T.A) |
| 30-Mar-2023 | 05:01:19 | 805 | ECR_ENV_20 | | | camera | 28 | 521993 | 6396360 | 522015 | 6396359 | -23 | 1 | 23 | 93 | PL | (Corr'd Nav, Kongsberg 14208, img#36) (V) (T.A) |
| 30-Mar-2023 | 05:01:27 | 806 | ECR_ENV_20 | | | camera | 28 | 521992 | 6396360 | 522015 | 6396359 | -24 | 1 | 23 | 92 | PL | (Corr'd Nav, Kongsberg 14208, img#37) (V) (T.A) |
| 30-Mar-2023 | 05:01:43 | 807 | ECR_ENV_20 | | | camera | 28 | 521991 | 6396360 | 522015 | 6396359 | -25 | 1 | 25 | 92 | PL | (Corr'd Nav, Kongsberg 14208, img#38) (V) (T.A) |
| 30-Mar-2023 | 05:02:08 | 808 | ECR_ENV_20 | | | camera | 27 | 521989 | 6396362 | 522015 | 6396359 | -26 | 3 | 27 | 97 | PL | (Corr'd Nav, Kongsberg 14208, img#39) (V) (T.A) |
| 30-Mar-2023 | 05:02:15 | 809 | ECR_ENV_20 | | | camera | 27 | 521988 | 6396362 | 522015 | 6396359 | -28 | 3 | 28 | 97 | PL | (Corr'd Nav, Kongsberg 14208, img#40) (V) (T.A) |
| 30-Mar-2023 | 05:02:38 | 810 | ECR_ENV_20 | | | camera | 27 | 521983 | 6396361 | 522015 | 6396359 | -33 | 2 | 33 | 94 | PL | (Corr'd Nav, Kongsberg 14208, img#41) (V) (T.A) |
| 30-Mar-2023 | 05:03:04 | 811 | ECR_ENV_20 | | | camera | 27 | 521979 | 6396359 | 522015 | 6396359 | -36 | 0 | 36 | 91 | PL | (Corr'd Nav, Kongsberg 14208, img#42) (V) (T.A) |
| 30-Mar-2023 | 05:03:23 | 812 | ECR_ENV_20 | | | camera | 28 | 521975 | 6396359 | 522015 | 6396359 | -40 | 0 | 40 | 91 | PL | (Corr'd Nav, Kongsberg 14208, img#43) (V) (T.A) |
| 30-Mar-2023 | 05:04:15 | 813 | ECR_ENV_20 | | | camera | 29 | 521967 | 6396359 | 522015 | 6396359 | -48 | -1 | 48 | 89 | PL | (Corr'd Nav, Kongsberg 14208, img#44) (V) (T.A) |
| 30-Mar-2023 | 05:04:21 | 814 | ECR_ENV_20 | | | camera | 29 | 521966 | 6396359 | 522015 | 6396359 | -49 | 0 | 49 | 90 | PL | (Corr'd Nav, Kongsberg 14208, img#45) (V) (T.A) |
| 30-Mar-2023 | 05:04:34 | 815 | ECR_ENV_20 | | | camera | 29 | 521965 | 6396359 | 522015 | 6396359 | -50 | 0 | 50 | 90 | PL | (Corr'd Nav, Kongsberg 14208, img#46) (V) (T.A) |
| 30-Mar-2023 | 07:38:17 | 816 | ECR_ENV_07 | | | camera | 33 | 523822 | 6395233 | 523782 | 6395200 | 40 | 33 | 52 | -130 | PL | (Raw Nav, Kongsberg 14208, img#1) (V) |
| 30-Mar-2023 | 07:38:24 | 817 | ECR_ENV_07 | | | camera | 33 | 523822 | 6395233 | 523782 | 6395200 | 40 | 33 | 52 | -130 | PL | (Raw Nav, Kongsberg 14208, img#2) (V) |
| 30-Mar-2023 | 07:38:57 | 818 | ECR_ENV_07 | | | camera | 33 | 523823 | 6395231 | 523782 | 6395200 | 41 | 31 | 51 | -127 | PL | (Raw Nav, Kongsberg 14208, img#3) (V) |
| 30-Mar-2023 | 07:39:06 | 819 | ECR_ENV_07 | | | camera | 33 | 523824 | 6395230 | 523782 | 6395200 | 42 | 30 | 52 | -126 | PL | (Raw Nav, Kongsberg 14208, img#4) (V) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 30-Mar-2023 | 07:39:13 | 820 | ECR_ENV_07 | | | camera | 33 | 523824 | 6395230 | 523782 | 6395200 | 42 | 30 | 52 | -126 | PL | (Raw Nav, Kongsberg 14208, img#5) (V) |
| 30-Mar-2023 | 07:39:21 | 821 | ECR_ENV_07 | | | camera | 33 | 523824 | 6395230 | 523782 | 6395200 | 42 | 30 | 52 | -126 | PL | (Raw Nav, Kongsberg 14208, img#6) (V) |
| 30-Mar-2023 | 07:39:35 | 822 | ECR_ENV_07 | | | camera | 33 | 523824 | 6395232 | 523782 | 6395200 | 42 | 32 | 53 | -128 | PL | (Raw Nav, Kongsberg 14208, img#7) (V) |
| 30-Mar-2023 | 07:39:48 | 823 | ECR_ENV_07 | | | camera | 33 | 523823 | 6395232 | 523782 | 6395200 | 41 | 32 | 52 | -128 | PL | (Raw Nav, Kongsberg 14208, img#8) (V) |
| 30-Mar-2023 | 07:40:41 | 824 | ECR_ENV_07 | | | camera | 33 | 523820 | 6395223 | 523782 | 6395200 | 38 | 23 | 44 | -121 | PL | (Raw Nav, Kongsberg 14208, img#9) (V) |
| 30-Mar-2023 | 07:40:48 | 825 | ECR_ENV_07 | | | camera | 33 | 523820 | 6395225 | 523782 | 6395200 | 38 | 25 | 45 | -124 | PL | (Raw Nav, Kongsberg 14208, img#10) (V) |
| 30-Mar-2023 | 07:40:55 | 826 | ECR_ENV_07 | | | camera | 33 | 523821 | 6395226 | 523782 | 6395200 | 39 | 26 | 47 | -124 | PL | (Raw Nav, Kongsberg 14208, img#11) (V) |
| 30-Mar-2023 | 07:41:03 | 827 | ECR_ENV_07 | | | camera | 33 | 523822 | 6395228 | 523782 | 6395200 | 40 | 28 | 49 | -125 | PL | (Raw Nav, Kongsberg 14208, img#12) (V) |
| 30-Mar-2023 | 07:41:11 | 828 | ECR_ENV_07 | | | camera | 33 | 523823 | 6395229 | 523782 | 6395200 | 41 | 29 | 50 | -126 | PL | (Raw Nav, Kongsberg 14208, img#13) (V) |
| 30-Mar-2023 | 07:41:53 | 829 | ECR_ENV_07 | | | camera | 33 | 523823 | 6395228 | 523782 | 6395200 | 41 | 28 | 50 | -125 | PL | (Raw Nav, Kongsberg 14208, img#14) (V) |
| 30-Mar-2023 | 07:42:02 | 830 | ECR_ENV_07 | | | camera | 33 | 523822 | 6395228 | 523782 | 6395200 | 40 | 28 | 49 | -125 | PL | (Raw Nav, Kongsberg 14208, img#15) (V) |
| 30-Mar-2023 | 07:42:08 | 831 | ECR_ENV_07 | | | camera | 33 | 523821 | 6395228 | 523782 | 6395200 | 39 | 28 | 48 | -126 | PL | (Raw Nav, Kongsberg 14208, img#16) (V) |
| 30-Mar-2023 | 07:42:35 | 832 | ECR_ENV_07 | | | camera | 33 | 523817 | 6395226 | 523782 | 6395200 | 35 | 26 | 44 | -127 | PL | (Raw Nav, Kongsberg 14208, img#17) (V) |
| 30-Mar-2023 | 07:42:46 | 833 | ECR_ENV_07 | | | camera | 33 | 523816 | 6395224 | 523782 | 6395200 | 34 | 24 | 42 | -126 | PL | (Raw Nav, Kongsberg 14208, img#18) (V) |
| 30-Mar-2023 | 07:42:56 | 834 | ECR_ENV_07 | | | camera | 33 | 523815 | 6395222 | 523782 | 6395200 | 33 | 22 | 40 | -124 | PL | (Raw Nav, Kongsberg 14208, img#19) (V) |
| 30-Mar-2023 | 07:43:05 | 835 | ECR_ENV_07 | | | camera | 33 | 523815 | 6395221 | 523782 | 6395200 | 33 | 21 | 39 | -123 | PL | (Raw Nav, Kongsberg 14208, img#20) (V) |
| 30-Mar-2023 | 07:43:17 | 836 | ECR_ENV_07 | | | camera | 33 | 523813 | 6395222 | 523782 | 6395200 | 31 | 22 | 38 | -126 | PL | (Raw Nav, Kongsberg 14208, img#21) (V) |
| 30-Mar-2023 | 07:43:39 | 837 | ECR_ENV_07 | | | camera | 33 | 523810 | 6395221 | 523782 | 6395200 | 28 | 21 | 35 | -127 | PL | (Raw Nav, Kongsberg 14208, img#22) (V) |
| 30-Mar-2023 | 07:43:54 | 838 | ECR_ENV_07 | | | camera | 33 | 523807 | 6395218 | 523782 | 6395200 | 25 | 18 | 31 | -126 | PL | (Raw Nav, Kongsberg 14208, img#23) (V) |
| 30-Mar-2023 | 07:44:06 | 839 | ECR_ENV_07 | | | camera | 33 | 523804 | 6395217 | 523782 | 6395200 | 22 | 17 | 28 | -128 | PL | (Raw Nav, Kongsberg 14208, img#24) (V) |
| 30-Mar-2023 | 07:44:23 | 840 | ECR_ENV_07 | | | camera | 33 | 523800 | 6395215 | 523782 | 6395200 | 18 | 15 | 23 | -130 | PL | (Raw Nav, Kongsberg 14208, img#25) (V) |
| 30-Mar-2023 | 07:44:27 | 841 | ECR_ENV_07 | | | camera | 33 | 523800 | 6395214 | 523782 | 6395200 | 18 | 14 | 23 | -129 | PL | (Raw Nav, Kongsberg 14208, img#26) (V) |
| 30-Mar-2023 | 07:44:36 | 842 | ECR_ENV_07 | | | camera | 33 | 523798 | 6395212 | 523782 | 6395200 | 16 | 12 | 20 | -128 | PL | (Raw Nav, Kongsberg 14208, img#27) (V) |
| 30-Mar-2023 | 07:44:57 | 843 | ECR_ENV_07 | | | camera | 33 | 523794 | 6395209 | 523782 | 6395200 | 12 | 9 | 15 | -128 | PL | (Raw Nav, Kongsberg 14208, img#28) (V) |
| 30-Mar-2023 | 07:45:08 | 844 | ECR_ENV_07 | | | camera | 33 | 523793 | 6395208 | 523782 | 6395200 | 11 | 8 | 14 | -127 | PL | (Raw Nav, Kongsberg 14208, img#29) (V) |
| 30-Mar-2023 | 07:45:19 | 845 | ECR_ENV_07 | | | camera | 33 | 523790 | 6395206 | 523782 | 6395200 | 8 | 6 | 10 | -128 | PL | (Raw Nav, Kongsberg 14208, img#30) (V) |
| 30-Mar-2023 | 07:45:38 | 846 | ECR_ENV_07 | | | camera | 33 | 523786 | 6395203 | 523782 | 6395200 | 4 | 3 | 5 | -130 | PL | (Raw Nav, Kongsberg 14208, img#31) (V) |
| 30-Mar-2023 | 07:45:46 | 847 | ECR_ENV_07 | | | camera | 33 | 523785 | 6395201 | 523782 | 6395200 | 3 | 1 | 3 | -112 | PL | (Raw Nav, Kongsberg 14208, img#32) (V) |
| 30-Mar-2023 | 07:45:52 | 848 | ECR_ENV_07 | | | camera | 33 | 523784 | 6395199 | 523782 | 6395200 | 2 | -1 | 2 | -64 | PL | (Raw Nav, Kongsberg 14208, img#33) (V) |
| 30-Mar-2023 | 07:46:18 | 849 | ECR_ENV_07 | | | camera | 33 | 523785 | 6395198 | 523782 | 6395200 | 3 | -2 | 3 | -56 | PL | (Raw Nav, Kongsberg 14208, img#34) (V) |
| 30-Mar-2023 | 07:46:48 | 850 | ECR_ENV_07 | | | camera | 33 | 523784 | 6395200 | 523782 | 6395200 | 2 | 0 | 2 | -95 | PL | (Raw Nav, Kongsberg 14208, img#35) (V) |
| 30-Mar-2023 | 07:47:02 | 851 | ECR_ENV_07 | | | camera | 32 | 523783 | 6395199 | 523782 | 6395200 | 1 | -1 | 1 | -42 | PL | (Raw Nav, Kongsberg 14208, img#36) (V) |
| 30-Mar-2023 | 07:47:46 | 852 | ECR_ENV_07 | | | camera | 32 | 523778 | 6395199 | 523782 | 6395200 | -4 | -1 | 4 | 79 | PL | (Raw Nav, Kongsberg 14208, img#37) (V) |
| 30-Mar-2023 | 07:48:17 | 853 | ECR_ENV_07 | | | camera | 32 | 523779 | 6395195 | 523782 | 6395200 | -3 | -5 | 6 | 34 | PL | (Raw Nav, Kongsberg 14208, img#38) (V) |
| 30-Mar-2023 | 07:48:27 | 854 | ECR_ENV_07 | | | camera | 32 | 523779 | 6395194 | 523782 | 6395200 | -3 | -6 | 7 | 29 | PL | (Raw Nav, Kongsberg 14208, img#39) (V) |
| 30-Mar-2023 | 07:48:38 | 855 | ECR_ENV_07 | | | camera | 32 | 523778 | 6395195 | 523782 | 6395200 | -4 | -5 | 6 | 41 | PL | (Raw Nav, Kongsberg 14208, img#40) (V) |
| 30-Mar-2023 | 07:49:31 | 856 | ECR_ENV_07 | | | camera | 32 | 523776 | 6395189 | 523782 | 6395200 | -6 | -11 | 13 | 30 | PL | (Raw Nav, Kongsberg 14208, img#41) (V) |
| 30-Mar-2023 | 07:50:04 | 857 | ECR_ENV_07 | | | camera | 32 | 523776 | 6395189 | 523782 | 6395200 | -6 | -11 | 13 | 30 | PL | (Raw Nav, Kongsberg 14208, img#42) (V) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 | |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 30-Mar-2023 | 07:50:31 | 858 | ECR_ENV_07 | | | camera | 32 | 523773 | 6395188 | 523782 | 6395200 | -9 | -12 | 15 | 38 | PL | (Raw Nav, Kongsberg 14208, img#43) (V) |
| 30-Mar-2023 | 07:50:55 | 859 | ECR_ENV_07 | | | camera | 32 | 523773 | 6395184 | 523782 | 6395200 | -9 | -16 | 18 | 30 | PL | (Raw Nav, Kongsberg 14208, img#44) (V) |
| 30-Mar-2023 | 07:51:17 | 860 | ECR_ENV_07 | | | camera | 32 | 523772 | 6395183 | 523782 | 6395200 | -10 | -17 | 20 | 31 | PL | (Raw Nav, Kongsberg 14208, img#45) (V) |
| 30-Mar-2023 | 07:51:27 | 861 | ECR_ENV_07 | | | camera | 32 | 523772 | 6395182 | 523782 | 6395200 | -10 | -18 | 21 | 30 | PL | (Raw Nav, Kongsberg 14208, img#46) (V) |
| 30-Mar-2023 | 07:51:35 | 862 | ECR_ENV_07 | | | camera | 32 | 523771 | 6395182 | 523782 | 6395200 | -11 | -18 | 21 | 32 | PL | (Raw Nav, Kongsberg 14208, img#47) (V) |
| 30-Mar-2023 | 07:52:02 | 863 | ECR_ENV_07 | | | camera | 32 | 523768 | 6395182 | 523782 | 6395200 | -14 | -18 | 23 | 39 | PL | (Raw Nav, Kongsberg 14208, img#48) (V) |
| 30-Mar-2023 | 07:52:56 | 864 | ECR_ENV_07 | | | camera | 32 | 523765 | 6395181 | 523782 | 6395200 | -17 | -19 | 26 | 42 | PL | (Raw Nav, Kongsberg 14208, img#49) (V) |
| 30-Mar-2023 | | 865 | ECR_ENV_07 | | | camera | | | | | | | | | | | Lost connection with EELS, Photo but no Fix taken |
| 30-Mar-2023 | | 866 | ECR_ENV_07 | | | camera | | | | | | | | | | | Lost connection with EELS, Photo but no Fix taken |
| 30-Mar-2023 | | 867 | ECR_ENV_07 | | | camera | | | | | | | | | | | Lost connection with EELS, Photo but no Fix taken |
| 30-Mar-2023 | | 868 | ECR_ENV_07 | | | camera | | | | | | | | | | | Lost connection with EELS, Photo but no Fix taken |
| 30-Mar-2023 | | 869 | ECR_ENV_07 | | | camera | | | | | | | | | | | Lost connection with EELS, Photo but no Fix taken |
| 30-Mar-2023 | | 870 | ECR_ENV_07 | | | camera | | | | | | | | | | | Lost connection with EELS, Photo but no Fix taken |
| 30-Mar-2023 | | 871 | ECR_ENV_07 | | | camera | | | | | | | | | | | Lost connection with EELS, Photo but no Fix taken |
| 30-Mar-2023 | | 872 | ECR_ENV_07 | | | camera | | | | | | | | | | | Lost connection with EELS, Photo but no Fix taken |
| 30-Mar-2023 | | 873 | ECR_ENV_07 | | | camera | | | | | | | | | | | Lost connection with EELS, Photo but no Fix taken |
| 30-Mar-2023 | | 874 | ECR_ENV_07 | | | camera | | | | | | | | | | | Lost connection with EELS, Photo but no Fix taken |
| 30-Mar-2023 | | 875 | ECR_ENV_07 | | | camera | | | | | | | | | | | Lost connection with EELS, Photo but no Fix taken |
| 30-Mar-2023 | 07:58:24 | 876 | ECR_ENV_07 | | | camera | 32 | 523761 | 6395174 | 523782 | 6395200 | -21 | -26 | 33 | 39 | PL | (Raw Nav, Kongsberg 14208, img#61) (V) |
| 30-Mar-2023 | 07:58:36 | 877 | ECR_ENV_07 | | | camera | 32 | 523760 | 6395173 | 523782 | 6395200 | -22 | -27 | 35 | 40 | PL | (Raw Nav, Kongsberg 14208, img#62) (V) |
| 30-Mar-2023 | 07:58:56 | 878 | ECR_ENV_07 | | | camera | 32 | 523759 | 6395172 | 523782 | 6395200 | -23 | -28 | 36 | 40 | PL | (Raw Nav, Kongsberg 14208, img#63) (V) |
| 30-Mar-2023 | 07:59:08 | 879 | ECR_ENV_07 | | | camera | 32 | 523758 | 6395171 | 523782 | 6395200 | -24 | -29 | 38 | 40 | PL | (Raw Nav, Kongsberg 14208, img#64) (V) |
| 30-Mar-2023 | 07:59:26 | 880 | ECR_ENV_07 | | | camera | 32 | 523757 | 6395170 | 523782 | 6395200 | -25 | -30 | 39 | 40 | PL | (Raw Nav, Kongsberg 14208, img#65) (V) |
| 30-Mar-2023 | 07:59:45 | 881 | ECR_ENV_07 | | | camera | 32 | 523756 | 6395170 | 523782 | 6395200 | -26 | -30 | 40 | 41 | PL | (Raw Nav, Kongsberg 14208, img#66) (V) |
| 30-Mar-2023 | 08:00:25 | 882 | ECR_ENV_07 | | | camera | 32 | 523753 | 6395168 | 523782 | 6395200 | -29 | -32 | 43 | 43 | PL | (Raw Nav, Kongsberg 14208, img#67) (V) |
| 30-Mar-2023 | 08:00:31 | 883 | ECR_ENV_07 | | | camera | 32 | 523753 | 6395168 | 523782 | 6395200 | -29 | -32 | 43 | 43 | PL | (Raw Nav, Kongsberg 14208, img#68) (V) |
| 30-Mar-2023 | 08:00:38 | 884 | ECR_ENV_07 | | | camera | 32 | 523752 | 6395168 | 523782 | 6395200 | -30 | -32 | 44 | 43 | PL | (Raw Nav, Kongsberg 14208, img#69) (V) |
| 30-Mar-2023 | 08:00:54 | 885 | ECR_ENV_07 | | | camera | 32 | 523751 | 6395166 | 523782 | 6395200 | -31 | -34 | 46 | 43 | PL | (Raw Nav, Kongsberg 14208, img#70) (V) |
| 02-Apr-2023 | 13:35:43 | 886 | ECR_ENV_16 | | | camera | 38 | 525472 | 6395987 | 525425 | 6395985 | 47 | 1 | 47 | -92 | SG | (Corr'd Nav, Kongsberg 14208, img#1) (V) (T.A) |
| 02-Apr-2023 | 13:35:59 | 887 | ECR_ENV_16 | | | camera | 38 | 525465 | 6395988 | 525425 | 6395985 | 40 | 3 | 40 | -94 | SG | (Corr'd Nav, Kongsberg 14208, img#2) (V) (T.A) |
| 02-Apr-2023 | 13:36:07 | 888 | ECR_ENV_16 | | | camera | 38 | 525461 | 6395988 | 525425 | 6395985 | 37 | 2 | 37 | -94 | SG | (Corr'd Nav, Kongsberg 14208, img#3) (V) (T.A) |
| 02-Apr-2023 | 13:36:15 | 889 | ECR_ENV_16 | | | camera | 38 | 525457 | 6395987 | 525425 | 6395985 | 33 | 2 | 33 | -93 | SG | (Corr'd Nav, Kongsberg 14208, img#4) (V) (T.A) |
| 02-Apr-2023 | 13:36:27 | 890 | ECR_ENV_16 | | | camera | 38 | 525453 | 6395986 | 525425 | 6395985 | 28 | 1 | 28 | -91 | SG | (Corr'd Nav, Kongsberg 14208, img#5) (V) (T.A) |
| 02-Apr-2023 | 13:36:45 | 891 | ECR_ENV_16 | | | camera | 38 | 525449 | 6395984 | 525425 | 6395985 | 24 | -1 | 24 | -88 | SG | (Corr'd Nav, Kongsberg 14208, img#6) (V) (T.A) |
| 02-Apr-2023 | 13:36:48 | 892 | ECR_ENV_16 | | | camera | 38 | 525448 | 6395984 | 525425 | 6395985 | 24 | -1 | 24 | -87 | SG | (Corr'd Nav, Kongsberg 14208, img#7) (V) (T.A) # No photo taken |
| 02-Apr-2023 | 13:37:06 | 893 | ECR_ENV_16 | | | camera | 38 | 525445 | 6395982 | 525425 | 6395985 | 21 | -3 | 21 | -81 | SG | (Corr'd Nav, Kongsberg 14208, img#8) (V) (T.A) |
| 02-Apr-2023 | 13:37:20 | 894 | ECR_ENV_16 | | | camera | 38 | 525443 | 6395981 | 525425 | 6395985 | 18 | -5 | 19 | -75 | SG | (Corr'd Nav, Kongsberg 14208, img#9) (V) (T.A) |
| 02-Apr-2023 | 13:37:46 | 895 | ECR_ENV_16 | | | camera | 38 | 525437 | 6395982 | 525425 | 6395985 | 13 | -3 | 13 | -75 | SG | (Corr'd Nav, Kongsberg 14208, img#10) (V) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 | | |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | | Vertical / Tidal Datum | VORF, LAT | | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 02-Apr-2023 | 13:37:56 | 896 | ECR_ENV_16 | | | camera | 38 | 525436 | 6395983 | 525425 | 6395985 | 11 | -3 | 11 | -75 | SG | (Corr'd Nav, Kongsberg 14208, img#11) (V) (T.A) |
| 02-Apr-2023 | 13:38:03 | 897 | ECR_ENV_16 | | | camera | 38 | 525435 | 6395983 | 525425 | 6395985 | 10 | -2 | 10 | -77 | SG | (Corr'd Nav, Kongsberg 14208, img#12) (V) (T.A) # No photo taken |
| 02-Apr-2023 | 13:38:30 | 898 | ECR_ENV_16 | | | camera | 38 | 525434 | 6395985 | 525425 | 6395985 | 9 | 0 | 9 | -90 | SG | (Corr'd Nav, Kongsberg 14208, img#13) (V) (T.A) |
| 02-Apr-2023 | 13:38:41 | 899 | ECR_ENV_16 | | | camera | 38 | 525436 | 6395986 | 525425 | 6395985 | 11 | 1 | 11 | -95 | SG | (Corr'd Nav, Kongsberg 14208, img#14) (V) (T.A) |
| 02-Apr-2023 | 13:39:01 | 900 | ECR_ENV_16 | | | camera | 38 | 525433 | 6395986 | 525425 | 6395985 | 9 | 0 | 9 | -93 | SG | (Corr'd Nav, Kongsberg 14208, img#15) (V) (T.A) |
| 02-Apr-2023 | 13:39:30 | 901 | ECR_ENV_16 | | | camera | 38 | 525433 | 6395985 | 525425 | 6395985 | 8 | -1 | 8 | -84 | SG | (Corr'd Nav, Kongsberg 14208, img#16) (V) (T.A) |
| 02-Apr-2023 | 13:40:12 | 902 | ECR_ENV_16 | | | camera | 38 | 525431 | 6395981 | 525425 | 6395985 | 7 | -4 | 8 | -57 | SG | (Corr'd Nav, Kongsberg 14208, img#17) (V) (T.A) |
| 02-Apr-2023 | 13:40:35 | 903 | ECR_ENV_16 | | | camera | 38 | 525428 | 6395982 | 525425 | 6395985 | 4 | -4 | 5 | -43 | SG | (Corr'd Nav, Kongsberg 14208, img#18) (V) (T.A) |
| 02-Apr-2023 | 13:40:47 | 904 | ECR_ENV_16 | | | camera | 39 | 525429 | 6395983 | 525425 | 6395985 | 4 | -2 | 5 | -62 | SG | (Corr'd Nav, Kongsberg 14208, img#19) (V) (T.A) |
| 02-Apr-2023 | 13:41:01 | 905 | ECR_ENV_16 | | | camera | 39 | 525431 | 6395985 | 525425 | 6395985 | 6 | -1 | 6 | -85 | SG | (Corr'd Nav, Kongsberg 14208, img#20) (V) (T.A) |
| 02-Apr-2023 | 13:41:19 | 906 | ECR_ENV_16 | | | camera | 39 | 525431 | 6395985 | 525425 | 6395985 | 7 | 0 | 7 | -89 | SG | (Corr'd Nav, Kongsberg 14208, img#21) (V) (T.A) |
| 02-Apr-2023 | 13:41:58 | 907 | ECR_ENV_16 | | | camera | 39 | 525423 | 6395983 | 525425 | 6395985 | -2 | -2 | 3 | 46 | SG | (Corr'd Nav, Kongsberg 14208, img#22) (V) (T.A) |
| 02-Apr-2023 | 13:42:13 | 908 | ECR_ENV_16 | | | camera | 39 | 525421 | 6395983 | 525425 | 6395985 | -4 | -3 | 5 | 56 | SG | (Corr'd Nav, Kongsberg 14208, img#23) (V) (T.A) |
| 02-Apr-2023 | 13:42:35 | 909 | ECR_ENV_16 | | | camera | 39 | 525421 | 6395983 | 525425 | 6395985 | -3 | -3 | 4 | 49 | SG | (Corr'd Nav, Kongsberg 14208, img#24) (V) (T.A) |
| 02-Apr-2023 | 13:43:00 | 910 | ECR_ENV_16 | | | camera | 39 | 525422 | 6395986 | 525425 | 6395985 | -3 | 0 | 3 | 92 | SG | (Corr'd Nav, Kongsberg 14208, img#25) (V) (T.A) |
| 02-Apr-2023 | 13:43:17 | 911 | ECR_ENV_16 | | | camera | 39 | 525422 | 6395988 | 525425 | 6395985 | -3 | 3 | 4 | 130 | SG | (Corr'd Nav, Kongsberg 14208, img#26) (V) (T.A) |
| 02-Apr-2023 | 13:43:55 | 912 | ECR_ENV_16 | | | camera | 39 | 525421 | 6395984 | 525425 | 6395985 | -3 | -1 | 4 | 67 | SG | (Corr'd Nav, Kongsberg 14208, img#27) (V) (T.A) |
| 02-Apr-2023 | 13:45:16 | 913 | ECR_ENV_16 | | | camera | 39 | 525414 | 6395979 | 525425 | 6395985 | -11 | -6 | 13 | 60 | SG | (Corr'd Nav, Kongsberg 14208, img#28) (V) (T.A) |
| 02-Apr-2023 | 13:45:26 | 914 | ECR_ENV_16 | | | camera | 39 | 525412 | 6395980 | 525425 | 6395985 | -13 | -5 | 14 | 68 | SG | (Corr'd Nav, Kongsberg 14208, img#29) (V) (T.A) |
| 02-Apr-2023 | 13:45:50 | 915 | ECR_ENV_16 | | | camera | 39 | 525408 | 6395983 | 525425 | 6395985 | -16 | -3 | 17 | 80 | SG | (Corr'd Nav, Kongsberg 14208, img#30) (V) (T.A) |
| 02-Apr-2023 | 13:46:13 | 916 | ECR_ENV_16 | | | camera | 39 | 525405 | 6395983 | 525425 | 6395985 | -20 | -3 | 20 | 83 | SG | (Corr'd Nav, Kongsberg 14208, img#31) (V) (T.A) |
| 02-Apr-2023 | 13:46:22 | 917 | ECR_ENV_16 | | | camera | 39 | 525404 | 6395983 | 525425 | 6395985 | -21 | -3 | 21 | 82 | SG | (Corr'd Nav, Kongsberg 14208, img#32) (V) (T.A) |
| 02-Apr-2023 | 13:46:31 | 918 | ECR_ENV_16 | | | camera | 39 | 525402 | 6395983 | 525425 | 6395985 | -23 | -3 | 23 | 83 | SG | (Corr'd Nav, Kongsberg 14208, img#33) (V) (T.A) |
| 02-Apr-2023 | 13:46:39 | 919 | ECR_ENV_16 | | | camera | 39 | 525400 | 6395984 | 525425 | 6395985 | -24 | -2 | 24 | 86 | SG | (Corr'd Nav, Kongsberg 14208, img#34) (V) (T.A) |
| 02-Apr-2023 | 13:46:48 | 920 | ECR_ENV_16 | | | camera | 39 | 525399 | 6395985 | 525425 | 6395985 | -26 | -1 | 26 | 88 | SG | (Corr'd Nav, Kongsberg 14208, img#35) (V) (T.A) |
| 02-Apr-2023 | 13:46:54 | 921 | ECR_ENV_16 | | | camera | 39 | 525398 | 6395985 | 525425 | 6395985 | -27 | 0 | 27 | 90 | SG | (Corr'd Nav, Kongsberg 14208, img#36) (V) (T.A) |
| 02-Apr-2023 | 13:47:09 | 922 | ECR_ENV_16 | | | camera | 39 | 525393 | 6395986 | 525425 | 6395985 | -31 | 0 | 31 | 91 | SG | (Corr'd Nav, Kongsberg 14208, img#37) (V) (T.A) |
| 02-Apr-2023 | 13:47:24 | 923 | ECR_ENV_16 | | | camera | 39 | 525390 | 6395986 | 525425 | 6395985 | -35 | 0 | 35 | 90 | SG | (Corr'd Nav, Kongsberg 14208, img#38) (V) (T.A) |
| 02-Apr-2023 | 13:47:44 | 924 | ECR_ENV_16 | | | camera | 39 | 525386 | 6395985 | 525425 | 6395985 | -39 | 0 | 39 | 90 | SG | (Corr'd Nav, Kongsberg 14208, img#39) (V) (T.A) |
| 02-Apr-2023 | 13:47:56 | 925 | ECR_ENV_16 | | | camera | 39 | 525384 | 6395985 | 525425 | 6395985 | -41 | -1 | 41 | 89 | SG | (Corr'd Nav, Kongsberg 14208, img#40) (V) (T.A) # No photo taken |
| 02-Apr-2023 | 13:48:04 | 926 | ECR_ENV_16 | | | camera | 39 | 525383 | 6395984 | 525425 | 6395985 | -42 | -1 | 42 | 89 | SG | (Corr'd Nav, Kongsberg 14208, img#41) (V) (T.A) |
| 02-Apr-2023 | 13:48:17 | 927 | ECR_ENV_16 | | | camera | 39 | 525381 | 6395985 | 525425 | 6395985 | -44 | 0 | 44 | 89 | SG | (Corr'd Nav, Kongsberg 14208, img#42) (V) (T.A) |
| 02-Apr-2023 | 13:48:52 | 928 | ECR_ENV_16 | | | camera | 39 | 525378 | 6395984 | 525425 | 6395985 | -47 | -1 | 47 | 89 | SG | (Corr'd Nav, Kongsberg 14208, img#43) (V) (T.A) |
| 02-Apr-2023 | 15:48:33 | 929 | ECR_ENV_25 | | | camera | 73 | 528374 | 6398309 | 528441 | 6398316 | -66 | -6 | 67 | 85 | SG | (Corr'd Nav, Kongsberg 14208, img#1) (V) (T.A) |
| 02-Apr-2023 | 15:49:03 | 930 | ECR_ENV_25 | | | camera | 73 | 528379 | 6398310 | 528441 | 6398316 | -62 | -6 | 62 | 84 | SG | (Corr'd Nav, Kongsberg 14208, img#2) (V) (T.A) |
| 02-Apr-2023 | 15:49:11 | 931 | ECR_ENV_25 | | | camera | 73 | 528380 | 6398310 | 528441 | 6398316 | -61 | -6 | 61 | 85 | SG | (Corr'd Nav, Kongsberg 14208, img#3) (V) (T.A) |
| 02-Apr-2023 | 15:49:54 | 932 | ECR_ENV_25 | | | camera | 73 | 528384 | 6398311 | 528441 | 6398316 | -57 | -4 | 57 | 86 | SG | (Corr'd Nav, Kongsberg 14208, img#4) (V) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 02-Apr-2023 | 15:50:37 | 933 | ECR_ENV_25 | | | camera | 74 | 528390 | 6398314 | 528441 | 6398316 | -51 | -2 | 51 | 88 | SG | (Corr'd Nav, Kongsberg 14208, img#5) (V) (T.A) |
| 02-Apr-2023 | 15:51:07 | 934 | ECR_ENV_25 | | | camera | 73 | 528394 | 6398316 | 528441 | 6398316 | -47 | 0 | 47 | 90 | SG | (Corr'd Nav, Kongsberg 14208, img#6) (V) (T.A) |
| 02-Apr-2023 | 15:51:25 | 935 | ECR_ENV_25 | | | camera | 73 | 528396 | 6398317 | 528441 | 6398316 | -45 | 1 | 45 | 91 | SG | (Corr'd Nav, Kongsberg 14208, img#7) (V) (T.A) |
| 02-Apr-2023 | 15:51:41 | 936 | ECR_ENV_25 | | | camera | 73 | 528398 | 6398315 | 528441 | 6398316 | -43 | -1 | 43 | 89 | SG | (Corr'd Nav, Kongsberg 14208, img#8) (V) (T.A) |
| 02-Apr-2023 | 15:51:49 | 937 | ECR_ENV_25 | | | camera | 74 | 528398 | 6398314 | 528441 | 6398316 | -43 | -2 | 43 | 88 | SG | (Corr'd Nav, Kongsberg 14208, img#9) (V) (T.A) |
| 02-Apr-2023 | 15:52:11 | 938 | ECR_ENV_25 | | | camera | 73 | 528401 | 6398314 | 528441 | 6398316 | -39 | -2 | 39 | 87 | SG | (Corr'd Nav, Kongsberg 14208, img#10) (V) (T.A) |
| 02-Apr-2023 | 15:52:38 | 939 | ECR_ENV_25 | | | camera | 74 | 528405 | 6398314 | 528441 | 6398316 | -36 | -1 | 36 | 88 | SG | (Corr'd Nav, Kongsberg 14208, img#11) (V) (T.A) |
| 02-Apr-2023 | 15:52:59 | 940 | ECR_ENV_25 | | | camera | 74 | 528408 | 6398315 | 528441 | 6398316 | -32 | -1 | 32 | 88 | SG | (Corr'd Nav, Kongsberg 14208, img#12) (V) (T.A) |
| 02-Apr-2023 | 15:53:37 | 941 | ECR_ENV_25 | | | camera | 74 | 528412 | 6398315 | 528441 | 6398316 | -29 | -1 | 29 | 88 | SG | (Corr'd Nav, Kongsberg 14208, img#13) (V) (T.A) |
| 02-Apr-2023 | 15:53:47 | 942 | ECR_ENV_25 | | | camera | 74 | 528413 | 6398314 | 528441 | 6398316 | -28 | -1 | 28 | 87 | SG | (Corr'd Nav, Kongsberg 14208, img#14) (V) (T.A) |
| 02-Apr-2023 | 15:54:20 | 943 | ECR_ENV_25 | | | camera | 74 | 528417 | 6398313 | 528441 | 6398316 | -24 | -2 | 24 | 84 | SG | (Corr'd Nav, Kongsberg 14208, img#15) (V) (T.A) |
| 02-Apr-2023 | 15:54:47 | 944 | ECR_ENV_25 | | | camera | 74 | 528422 | 6398314 | 528441 | 6398316 | -19 | -1 | 19 | 86 | SG | (Corr'd Nav, Kongsberg 14208, img#16) (V) (T.A) |
| 02-Apr-2023 | 15:55:17 | 945 | ECR_ENV_25 | | | camera | 74 | 528425 | 6398316 | 528441 | 6398316 | -16 | 0 | 16 | 90 | SG | (Corr'd Nav, Kongsberg 14208, img#17) (V) (T.A) |
| 02-Apr-2023 | 15:55:35 | 946 | ECR_ENV_25 | | | camera | 74 | 528427 | 6398314 | 528441 | 6398316 | -14 | -1 | 14 | 84 | SG | (Corr'd Nav, Kongsberg 14208, img#18) (V) (T.A) |
| 02-Apr-2023 | 15:56:16 | 947 | ECR_ENV_25 | | | camera | 74 | 528434 | 6398313 | 528441 | 6398316 | -7 | -3 | 8 | 67 | SG | (Corr'd Nav, Kongsberg 14208, img#19) (V) (T.A) |
| 02-Apr-2023 | 15:56:39 | 948 | ECR_ENV_25 | | | camera | 74 | 528438 | 6398313 | 528441 | 6398316 | -3 | -3 | 4 | 50 | SG | (Corr'd Nav, Kongsberg 14208, img#20) (V) (T.A) |
| 02-Apr-2023 | 15:57:09 | 949 | ECR_ENV_25 | | | camera | 74 | 528442 | 6398314 | 528441 | 6398316 | 1 | -1 | 2 | -33 | SG | (Corr'd Nav, Kongsberg 14208, img#21) (V) (T.A) |
| 02-Apr-2023 | 15:57:36 | 950 | ECR_ENV_25 | | | camera | 74 | 528445 | 6398315 | 528441 | 6398316 | 4 | -1 | 4 | -82 | SG | (Corr'd Nav, Kongsberg 14208, img#22) (V) (T.A) |
| 02-Apr-2023 | 15:57:50 | 951 | ECR_ENV_25 | | | camera | 74 | 528447 | 6398314 | 528441 | 6398316 | 6 | -1 | 6 | -76 | SG | (Corr'd Nav, Kongsberg 14208, img#23) (V) (T.A) |
| 02-Apr-2023 | 15:58:01 | 952 | ECR_ENV_25 | | | camera | 74 | 528448 | 6398313 | 528441 | 6398316 | 8 | -2 | 8 | -74 | SG | (Corr'd Nav, Kongsberg 14208, img#24) (V) (T.A) |
| 02-Apr-2023 | 15:58:10 | 953 | ECR_ENV_25 | | | camera | 74 | 528450 | 6398313 | 528441 | 6398316 | 9 | -2 | 10 | -77 | SG | (Corr'd Nav, Kongsberg 14208, img#25) (V) (T.A) |
| 02-Apr-2023 | 15:58:28 | 954 | ECR_ENV_25 | | | camera | 74 | 528453 | 6398314 | 528441 | 6398316 | 12 | -2 | 12 | -83 | SG | (Corr'd Nav, Kongsberg 14208, img#26) (V) (T.A) |
| 02-Apr-2023 | 15:58:36 | 955 | ECR_ENV_25 | | | camera | 74 | 528454 | 6398314 | 528441 | 6398316 | 13 | -1 | 13 | -84 | SG | (Corr'd Nav, Kongsberg 14208, img#27) (V) (T.A) |
| 02-Apr-2023 | 15:58:51 | 956 | ECR_ENV_25 | | | camera | 74 | 528455 | 6398314 | 528441 | 6398316 | 14 | -1 | 14 | -85 | SG | (Corr'd Nav, Kongsberg 14208, img#28) (V) (T.A) |
| 02-Apr-2023 | 15:59:05 | 957 | ECR_ENV_25 | | | camera | 74 | 528456 | 6398313 | 528441 | 6398316 | 15 | -2 | 16 | -81 | SG | (Corr'd Nav, Kongsberg 14208, img#29) (V) (T.A) |
| 02-Apr-2023 | 15:59:15 | 958 | ECR_ENV_25 | | | camera | 74 | 528458 | 6398313 | 528441 | 6398316 | 17 | -3 | 17 | -81 | SG | (Corr'd Nav, Kongsberg 14208, img#30) (V) (T.A) |
| 02-Apr-2023 | 15:59:31 | 959 | ECR_ENV_25 | | | camera | 74 | 528460 | 6398313 | 528441 | 6398316 | 20 | -2 | 20 | -83 | SG | (Corr'd Nav, Kongsberg 14208, img#31) (V) (T.A) |
| 02-Apr-2023 | 15:59:47 | 960 | ECR_ENV_25 | | | camera | 74 | 528462 | 6398314 | 528441 | 6398316 | 22 | -2 | 22 | -85 | SG | (Corr'd Nav, Kongsberg 14208, img#32) (V) (T.A) |
| 02-Apr-2023 | 16:00:15 | 961 | ECR_ENV_25 | | | camera | 74 | 528466 | 6398316 | 528441 | 6398316 | 26 | 0 | 26 | -90 | SG | (Corr'd Nav, Kongsberg 14208, img#33) (V) (T.A) |
| 02-Apr-2023 | 16:00:43 | 962 | ECR_ENV_25 | | | camera | 74 | 528469 | 6398316 | 528441 | 6398316 | 28 | 1 | 28 | -91 | SG | (Corr'd Nav, Kongsberg 14208, img#34) (V) (T.A) |
| 02-Apr-2023 | 16:00:58 | 963 | ECR_ENV_25 | | | camera | 74 | 528471 | 6398315 | 528441 | 6398316 | 30 | -1 | 30 | -88 | SG | (Corr'd Nav, Kongsberg 14208, img#35) (V) (T.A) |
| 02-Apr-2023 | 16:01:10 | 964 | ECR_ENV_25 | | | camera | 74 | 528472 | 6398314 | 528441 | 6398316 | 32 | -2 | 32 | -87 | SG | (Corr'd Nav, Kongsberg 14208, img#36) (V) (T.A) |
| 02-Apr-2023 | 16:01:27 | 965 | ECR_ENV_25 | | | camera | 74 | 528475 | 6398315 | 528441 | 6398316 | 34 | -1 | 34 | -88 | SG | (Corr'd Nav, Kongsberg 14208, img#37) (V) (T.A) |
| 02-Apr-2023 | 16:01:41 | 966 | ECR_ENV_25 | | | camera | 74 | 528477 | 6398315 | 528441 | 6398316 | 36 | -1 | 36 | -89 | SG | (Corr'd Nav, Kongsberg 14208, img#38) (V) (T.A) |
| 02-Apr-2023 | 16:02:04 | 967 | ECR_ENV_25 | | | camera | 74 | 528480 | 6398313 | 528441 | 6398316 | 39 | -3 | 39 | -86 | SG | (Corr'd Nav, Kongsberg 14208, img#39) (V) (T.A) |
| 02-Apr-2023 | 16:02:23 | 968 | ECR_ENV_25 | | | camera | 74 | 528481 | 6398312 | 528441 | 6398316 | 40 | -4 | 40 | -85 | SG | (Corr'd Nav, Kongsberg 14208, img#40) (V) (T.A) |
| 02-Apr-2023 | 16:02:33 | 969 | ECR_ENV_25 | | | camera | 74 | 528483 | 6398312 | 528441 | 6398316 | 42 | -3 | 42 | -86 | SG | (Corr'd Nav, Kongsberg 14208, img#41) (V) (T.A) |
| 02-Apr-2023 | 16:02:43 | 970 | ECR_ENV_25 | | | camera | 74 | 528485 | 6398313 | 528441 | 6398316 | 44 | -2 | 44 | -87 | SG | (Corr'd Nav, Kongsberg 14208, img#42) (V) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 02-Apr-2023 | 16:02:59 | 971 | ECR_ENV_25 | | | camera | 74 | 528488 | 6398316 | 528441 | 6398316 | 47 | 0 | 47 | -90 | SG | (Corr'd Nav, Kongsberg 14208, img#43) (V) (T.A) |
| 02-Apr-2023 | 17:37:27 | 972 | ECR_ENV_33 | | | camera | 90 | 527725 | 6399744 | 527780 | 6399737 | -55 | 7 | 55 | 97 | SG | (Corr'd Nav, Kongsberg 14208, img#1) (V) (T.A) |
| 02-Apr-2023 | 17:37:49 | 973 | ECR_ENV_33 | | | camera | 90 | 527727 | 6399745 | 527780 | 6399737 | -53 | 8 | 53 | 98 | SG | (Corr'd Nav, Kongsberg 14208, img#2) (V) (T.A) |
| 02-Apr-2023 | 17:38:23 | 974 | ECR_ENV_33 | | | camera | 90 | 527731 | 6399743 | 527780 | 6399737 | -48 | 6 | 48 | 97 | SG | (Corr'd Nav, Kongsberg 14208, img#3) (V) (T.A) |
| 02-Apr-2023 | 17:38:31 | 975 | ECR_ENV_33 | | | camera | 90 | 527732 | 6399741 | 527780 | 6399737 | -48 | 4 | 48 | 95 | SG | (Corr'd Nav, Kongsberg 14208, img#4) (V) (T.A) |
| 02-Apr-2023 | 17:39:09 | 976 | ECR_ENV_33 | | | camera | 90 | 527737 | 6399739 | 527780 | 6399737 | -43 | 2 | 43 | 93 | SG | (Corr'd Nav, Kongsberg 14208, img#5) (V) (T.A) |
| 02-Apr-2023 | 17:39:22 | 977 | ECR_ENV_33 | | | camera | 90 | 527739 | 6399739 | 527780 | 6399737 | -41 | 3 | 41 | 94 | SG | (Corr'd Nav, Kongsberg 14208, img#6) (V) (T.A) |
| 02-Apr-2023 | 17:39:39 | 978 | ECR_ENV_33 | | | camera | 90 | 527741 | 6399740 | 527780 | 6399737 | -39 | 3 | 39 | 95 | SG | (Corr'd Nav, Kongsberg 14208, img#7) (V) (T.A) |
| 02-Apr-2023 | 17:40:03 | 979 | ECR_ENV_33 | | | camera | 90 | 527745 | 6399741 | 527780 | 6399737 | -35 | 4 | 35 | 97 | SG | (Corr'd Nav, Kongsberg 14208, img#8) (V) (T.A) |
| 02-Apr-2023 | 17:40:13 | 980 | ECR_ENV_33 | | | camera | 90 | 527746 | 6399741 | 527780 | 6399737 | -33 | 5 | 34 | 98 | SG | (Corr'd Nav, Kongsberg 14208, img#9) (V) (T.A) |
| 02-Apr-2023 | 17:40:26 | 981 | ECR_ENV_33 | | | camera | 90 | 527748 | 6399741 | 527780 | 6399737 | -32 | 4 | 32 | 98 | SG | (Corr'd Nav, Kongsberg 14208, img#10) (V) (T.A) |
| 02-Apr-2023 | 17:40:51 | 982 | ECR_ENV_33 | | | camera | 90 | 527752 | 6399741 | 527780 | 6399737 | -28 | 4 | 28 | 98 | SG | (Corr'd Nav, Kongsberg 14208, img#11) (V) (T.A) |
| 02-Apr-2023 | 17:41:04 | 983 | ECR_ENV_33 | | | camera | 90 | 527754 | 6399741 | 527780 | 6399737 | -25 | 4 | 26 | 99 | SG | (Corr'd Nav, Kongsberg 14208, img#12) (V) (T.A) |
| 02-Apr-2023 | 17:41:19 | 984 | ECR_ENV_33 | | | camera | 90 | 527756 | 6399740 | 527780 | 6399737 | -24 | 3 | 24 | 97 | SG | (Corr'd Nav, Kongsberg 14208, img#13) (V) (T.A) |
| 02-Apr-2023 | 17:41:44 | 985 | ECR_ENV_33 | | | camera | 90 | 527757 | 6399741 | 527780 | 6399737 | -22 | 4 | 23 | 100 | SG | (Corr'd Nav, Kongsberg 14208, img#14) (V) (T.A) |
| 02-Apr-2023 | 17:42:01 | 986 | ECR_ENV_33 | | | camera | 90 | 527760 | 6399741 | 527780 | 6399737 | -20 | 5 | 21 | 103 | SG | (Corr'd Nav, Kongsberg 14208, img#15) (V) (T.A) |
| 02-Apr-2023 | 17:42:10 | 987 | ECR_ENV_33 | | | camera | 90 | 527761 | 6399741 | 527780 | 6399737 | -19 | 4 | 19 | 103 | SG | (Corr'd Nav, Kongsberg 14208, img#16) (V) (T.A) |
| 02-Apr-2023 | 17:42:21 | 988 | ECR_ENV_33 | | | camera | 90 | 527762 | 6399741 | 527780 | 6399737 | -17 | 4 | 18 | 102 | SG | (Corr'd Nav, Kongsberg 14208, img#17) (V) (T.A) |
| 02-Apr-2023 | 17:42:35 | 989 | ECR_ENV_33 | | | camera | 90 | 527763 | 6399740 | 527780 | 6399737 | -16 | 3 | 17 | 102 | SG | (Corr'd Nav, Kongsberg 14208, img#18) (V) (T.A) |
| 02-Apr-2023 | 17:43:20 | 990 | ECR_ENV_33 | | | camera | 90 | 527769 | 6399739 | 527780 | 6399737 | -11 | 2 | 11 | 99 | SG | (Corr'd Nav, Kongsberg 14208, img#19) (V) (T.A) |
| 02-Apr-2023 | 17:43:57 | 991 | ECR_ENV_33 | | | camera | 90 | 527776 | 6399741 | 527780 | 6399737 | -4 | 4 | 6 | 135 | SG | (Corr'd Nav, Kongsberg 14208, img#20) (V) (T.A) |
| 02-Apr-2023 | 17:44:19 | 992 | ECR_ENV_33 | | | camera | 91 | 527780 | 6399742 | 527780 | 6399737 | 0 | 6 | 6 | -178 | SG | (Corr'd Nav, Kongsberg 14208, img#21) (V) (T.A) |
| 02-Apr-2023 | 17:44:30 | 993 | ECR_ENV_33 | | | camera | 91 | 527782 | 6399743 | 527780 | 6399737 | 2 | 6 | 6 | -162 | SG | (Corr'd Nav, Kongsberg 14208, img#22) (V) (T.A) |
| 02-Apr-2023 | 17:44:41 | 994 | ECR_ENV_33 | | | camera | 91 | 527783 | 6399743 | 527780 | 6399737 | 4 | 6 | 7 | -146 | SG | (Corr'd Nav, Kongsberg 14208, img#23) (V) (T.A) |
| 02-Apr-2023 | 17:44:58 | 995 | ECR_ENV_33 | | | camera | 90 | 527786 | 6399741 | 527780 | 6399737 | 6 | 4 | 8 | -125 | SG | (Corr'd Nav, Kongsberg 14208, img#24) (V) (T.A) |
| 02-Apr-2023 | 17:45:19 | 996 | ECR_ENV_33 | | | camera | 91 | 527788 | 6399741 | 527780 | 6399737 | 8 | 4 | 9 | -114 | SG | (Corr'd Nav, Kongsberg 14208, img#25) (V) (T.A) |
| 02-Apr-2023 | 17:45:40 | 997 | ECR_ENV_33 | | | camera | 91 | 527790 | 6399739 | 527780 | 6399737 | 11 | 2 | 11 | -102 | SG | (Corr'd Nav, Kongsberg 14208, img#26) (V) (T.A) |
| 02-Apr-2023 | 17:45:59 | 998 | ECR_ENV_33 | | | camera | 91 | 527794 | 6399739 | 527780 | 6399737 | 15 | 2 | 15 | -99 | SG | (Corr'd Nav, Kongsberg 14208, img#27) (V) (T.A) |
| 02-Apr-2023 | 17:46:08 | 999 | ECR_ENV_33 | | | camera | 91 | 527796 | 6399739 | 527780 | 6399737 | 16 | 3 | 16 | -99 | SG | (Corr'd Nav, Kongsberg 14208, img#28) (V) (T.A) |
| 02-Apr-2023 | 17:46:27 | 1000 | ECR_ENV_33 | | | camera | 90 | 527798 | 6399740 | 527780 | 6399737 | 19 | 3 | 19 | -99 | SG | (Corr'd Nav, Kongsberg 14208, img#29) (V) (T.A) |
| 02-Apr-2023 | 17:46:39 | 1001 | ECR_ENV_33 | | | camera | 91 | 527799 | 6399738 | 527780 | 6399737 | 19 | 1 | 19 | -94 | SG | (Corr'd Nav, Kongsberg 14208, img#30) (V) (T.A) |
| 02-Apr-2023 | 17:46:54 | 1002 | ECR_ENV_33 | | | camera | 90 | 527799 | 6399735 | 527780 | 6399737 | 19 | -1 | 19 | -86 | SG | (Corr'd Nav, Kongsberg 14208, img#31) (V) (T.A) |
| 02-Apr-2023 | 17:47:05 | 1003 | ECR_ENV_33 | | | camera | 90 | 527800 | 6399735 | 527780 | 6399737 | 21 | -2 | 21 | -84 | SG | (Corr'd Nav, Kongsberg 14208, img#32) (V) (T.A) |
| 02-Apr-2023 | 17:47:15 | 1004 | ECR_ENV_33 | | | camera | 91 | 527802 | 6399736 | 527780 | 6399737 | 23 | -1 | 23 | -87 | SG | (Corr'd Nav, Kongsberg 14208, img#33) (V) (T.A) |
| 02-Apr-2023 | 17:47:22 | 1005 | ECR_ENV_33 | | | camera | 91 | 527804 | 6399736 | 527780 | 6399737 | 24 | -1 | 24 | -88 | SG | (Corr'd Nav, Kongsberg 14208, img#34) (V) (T.A) |
| 02-Apr-2023 | 17:47:39 | 1006 | ECR_ENV_33 | | | camera | 91 | 527806 | 6399738 | 527780 | 6399737 | 27 | 1 | 27 | -92 | SG | (Corr'd Nav, Kongsberg 14208, img#35) (V) (T.A) |
| 02-Apr-2023 | 17:48:00 | 1007 | ECR_ENV_33 | | | camera | 91 | 527809 | 6399739 | 527780 | 6399737 | 30 | 2 | 30 | -93 | SG | (Corr'd Nav, Kongsberg 14208, img#36) (V) (T.A) |
| 02-Apr-2023 | 17:48:14 | 1008 | ECR_ENV_33 | | | camera | 91 | 527811 | 6399739 | 527780 | 6399737 | 32 | 2 | 32 | -94 | SG | (Corr'd Nav, Kongsberg 14208, img#37) (V) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 | | |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | | Vertical / Tidal Datum | VORF, LAT | | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 02-Apr-2023 | 17:48:33 | 1009 | ECR_ENV_33 | | | camera | 91 | 527815 | 6399740 | 527780 | 6399737 | 35 | 3 | 36 | -94 | SG | (Corr'd Nav, Kongsberg 14208, img#38) (V) (T.A) |
| 02-Apr-2023 | 17:49:17 | 1010 | ECR_ENV_33 | | | camera | 91 | 527823 | 6399743 | 527780 | 6399737 | 44 | 6 | 44 | -98 | SG | (Corr'd Nav, Kongsberg 14208, img#39) (V) (T.A) |
| 02-Apr-2023 | 17:49:32 | 1011 | ECR_ENV_33 | | | camera | 91 | 527826 | 6399744 | 527780 | 6399737 | 46 | 7 | 47 | -99 | SG | (Corr'd Nav, Kongsberg 14208, img#40) (V) (T.A) |
| 03-Apr-2023 | 04:18:45 | 1012 | ECR_ENV_17 | | | camera | 75 | 525683 | 6400054 | 525685 | 6399992 | -2 | 62 | 62 | 178 | PL | (Corr'd Nav, Kongsberg 14208, img#1) (V) (T.A) |
| 03-Apr-2023 | 04:19:13 | 1013 | ECR_ENV_17 | | | camera | 75 | 525686 | 6400050 | 525685 | 6399992 | 0 | 58 | 58 | -180 | PL | (Corr'd Nav, Kongsberg 14208, img#2) (V) (T.A) |
| 03-Apr-2023 | 04:19:22 | 1014 | ECR_ENV_17 | | | camera | 75 | 525685 | 6400048 | 525685 | 6399992 | 0 | 56 | 56 | 180 | PL | (Corr'd Nav, Kongsberg 14208, img#3) (V) (T.A)<br># No photo taken |
| 03-Apr-2023 | 04:19:26 | 1015 | ECR_ENV_17 | | | camera | 75 | 525685 | 6400047 | 525685 | 6399992 | -1 | 55 | 55 | 179 | PL | (Corr'd Nav, Kongsberg 14208, img#4) (V) (T.A) |
| 03-Apr-2023 | 04:19:34 | 1016 | ECR_ENV_17 | | | camera | 75 | 525684 | 6400045 | 525685 | 6399992 | -1 | 53 | 53 | 179 | PL | (Corr'd Nav, Kongsberg 14208, img#5) (V) (T.A) |
| 03-Apr-2023 | 04:19:45 | 1017 | ECR_ENV_17 | | | camera | 75 | 525683 | 6400043 | 525685 | 6399992 | -2 | 51 | 51 | 177 | PL | (Corr'd Nav, Kongsberg 14208, img#6) (V) (T.A) |
| 03-Apr-2023 | 04:19:59 | 1018 | ECR_ENV_17 | | | camera | 75 | 525683 | 6400042 | 525685 | 6399992 | -3 | 50 | 50 | 177 | PL | (Corr'd Nav, Kongsberg 14208, img#7) (V) (T.A) |
| 03-Apr-2023 | 04:20:24 | 1019 | ECR_ENV_17 | | | camera | 75 | 525683 | 6400040 | 525685 | 6399992 | -2 | 47 | 47 | 178 | PL | (Corr'd Nav, Kongsberg 14208, img#8) (V) (T.A) |
| 03-Apr-2023 | 04:20:39 | 1020 | ECR_ENV_17 | | | camera | 75 | 525685 | 6400037 | 525685 | 6399992 | -1 | 45 | 45 | 179 | PL | (Corr'd Nav, Kongsberg 14208, img#9) (V) (T.A) |
| 03-Apr-2023 | 04:20:49 | 1021 | ECR_ENV_17 | | | camera | 75 | 525686 | 6400035 | 525685 | 6399992 | 0 | 43 | 43 | -180 | PL | (Corr'd Nav, Kongsberg 14208, img#10) (V) (T.A) |
| 03-Apr-2023 | 04:21:00 | 1022 | ECR_ENV_17 | | | camera | 75 | 525687 | 6400034 | 525685 | 6399992 | 1 | 42 | 42 | -178 | PL | (Corr'd Nav, Kongsberg 14208, img#11) (V) (T.A) |
| 03-Apr-2023 | 04:21:18 | 1023 | ECR_ENV_17 | | | camera | 75 | 525687 | 6400033 | 525685 | 6399992 | 2 | 41 | 41 | -178 | PL | (Corr'd Nav, Kongsberg 14208, img#12) (V) (T.A) |
| 03-Apr-2023 | 04:21:27 | 1024 | ECR_ENV_17 | | | camera | 74 | 525687 | 6400032 | 525685 | 6399992 | 1 | 39 | 39 | -178 | PL | (Corr'd Nav, Kongsberg 14208, img#13) (V) (T.A) |
| 03-Apr-2023 | 04:21:50 | 1025 | ECR_ENV_17 | | | camera | 74 | 525687 | 6400027 | 525685 | 6399992 | 1 | 35 | 35 | -178 | PL | (Corr'd Nav, Kongsberg 14208, img#14) (V) (T.A) |
| 03-Apr-2023 | 04:22:00 | 1026 | ECR_ENV_17 | | | camera | 74 | 525687 | 6400025 | 525685 | 6399992 | 1 | 33 | 33 | -178 | PL | (Corr'd Nav, Kongsberg 14208, img#15) (V) (T.A) |
| 03-Apr-2023 | 04:22:08 | 1027 | ECR_ENV_17 | | | camera | 74 | 525687 | 6400025 | 525685 | 6399992 | 1 | 33 | 32 | -178 | PL | (Corr'd Nav, Kongsberg 14208, img#16) (V) (T.A) |
| 03-Apr-2023 | 04:22:40 | 1028 | ECR_ENV_17 | | | camera | 74 | 525685 | 6400020 | 525685 | 6399992 | 0 | 28 | 28 | 180 | PL | (Corr'd Nav, Kongsberg 14208, img#17) (V) (T.A) |
| 03-Apr-2023 | 04:22:49 | 1029 | ECR_ENV_17 | | | camera | 74 | 525685 | 6400019 | 525685 | 6399992 | -1 | 27 | 26 | 179 | PL | (Corr'd Nav, Kongsberg 14208, img#18) (V) (T.A) |
| 03-Apr-2023 | 04:23:09 | 1030 | ECR_ENV_17 | | | camera | 74 | 525684 | 6400018 | 525685 | 6399992 | -1 | 26 | 26 | 177 | PL | (Corr'd Nav, Kongsberg 14208, img#19) (V) (T.A) |
| 03-Apr-2023 | 04:23:28 | 1031 | ECR_ENV_17 | | | camera | 74 | 525684 | 6400016 | 525685 | 6399992 | -1 | 24 | 24 | 177 | PL | (Corr'd Nav, Kongsberg 14208, img#20) (V) (T.A) |
| 03-Apr-2023 | 04:24:10 | 1032 | ECR_ENV_17 | | | camera | 74 | 525684 | 6400010 | 525685 | 6399992 | -1 | 18 | 18 | 177 | PL | (Corr'd Nav, Kongsberg 14208, img#21) (V) (T.A) |
| 03-Apr-2023 | 04:24:36 | 1033 | ECR_ENV_17 | | | camera | 74 | 525685 | 6400009 | 525685 | 6399992 | 0 | 16 | 16 | 179 | PL | (Corr'd Nav, Kongsberg 14208, img#22) (V) (T.A) |
| 03-Apr-2023 | 04:24:53 | 1034 | ECR_ENV_17 | | | camera | 74 | 525684 | 6400006 | 525685 | 6399992 | -2 | 14 | 14 | 173 | PL | (Corr'd Nav, Kongsberg 14208, img#23) (V) (T.A) |
| 03-Apr-2023 | 04:25:41 | 1035 | ECR_ENV_17 | | | camera | 74 | 525683 | 6399998 | 525685 | 6399992 | -2 | 6 | 6 | 158 | PL | (Corr'd Nav, Kongsberg 14208, img#24) (V) (T.A) |
| 03-Apr-2023 | 04:25:49 | 1036 | ECR_ENV_17 | | | camera | 74 | 525684 | 6399997 | 525685 | 6399992 | -2 | 5 | 5 | 160 | PL | (Corr'd Nav, Kongsberg 14208, img#25) (V) (T.A) |
| 03-Apr-2023 | 04:26:07 | 1037 | ECR_ENV_17 | | | camera | 74 | 525685 | 6399996 | 525685 | 6399992 | -1 | 4 | 4 | 168 | PL | (Corr'd Nav, Kongsberg 14208, img#26) (V) (T.A) |
| 03-Apr-2023 | 04:26:36 | 1038 | ECR_ENV_17 | | | camera | 74 | 525686 | 6399992 | 525685 | 6399992 | 1 | 0 | 1 | -76 | PL | (Corr'd Nav, Kongsberg 14208, img#27) (V) (T.A) |
| 03-Apr-2023 | 04:27:55 | 1039 | ECR_ENV_17 | | | camera | 74 | 525684 | 6399988 | 525685 | 6399992 | -2 | -4 | 4 | 24 | PL | (Corr'd Nav, Kongsberg 14208, img#28) (V) (T.A) |
| 03-Apr-2023 | 04:28:38 | 1040 | ECR_ENV_17 | | | camera | 74 | 525685 | 6399983 | 525685 | 6399992 | 0 | -10 | 10 | 0 | PL | (Corr'd Nav, Kongsberg 14208, img#29) (V) (T.A) |
| 03-Apr-2023 | 04:28:48 | 1041 | ECR_ENV_17 | | | camera | 74 | 525685 | 6399981 | 525685 | 6399992 | 0 | -11 | 11 | 1 | PL | (Corr'd Nav, Kongsberg 14208, img#30) (V) (T.A) |
| 03-Apr-2023 | 04:28:52 | 1042 | ECR_ENV_17 | | | camera | 74 | 525685 | 6399981 | 525685 | 6399992 | 0 | -12 | 12 | 1 | PL | (Corr'd Nav, Kongsberg 14208, img#31) (V) (T.A) |
| 03-Apr-2023 | 04:29:20 | 1043 | ECR_ENV_17 | | | camera | 74 | 525686 | 6399977 | 525685 | 6399992 | 0 | -16 | 16 | -1 | PL | (Corr'd Nav, Kongsberg 14208, img#32) (V) (T.A) |
| 03-Apr-2023 | 04:29:31 | 1044 | ECR_ENV_17 | | | camera | 74 | 525685 | 6399974 | 525685 | 6399992 | 0 | -18 | 18 | 0 | PL | (Corr'd Nav, Kongsberg 14208, img#33) (V) (T.A) |
| 03-Apr-2023 | 04:30:02 | 1045 | ECR_ENV_17 | | | camera | 74 | 525685 | 6399971 | 525685 | 6399992 | 0 | -22 | 22 | 1 | PL | (Corr'd Nav, Kongsberg 14208, img#34) (V) (T.A) |
| 03-Apr-2023 | 04:30:23 | 1046 | ECR_ENV_17 | | | camera | 74 | 525686 | 6399967 | 525685 | 6399992 | 0 | -25 | 25 | -1 | PL | (Corr'd Nav, Kongsberg 14208, img#35) (V) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 03-Apr-2023 | 04:30:37 | 1047 | ECR_ENV_17 | | | camera | 74 | 525686 | 6399965 | 525685 | 6399992 | 1 | -28 | 28 | -2 | PL | (Corr'd Nav, Kongsberg 14208, img#36) (V) (T.A) |
| 03-Apr-2023 | 04:30:47 | 1048 | ECR_ENV_17 | | | camera | 74 | 525686 | 6399963 | 525685 | 6399992 | 1 | -29 | 29 | -2 | PL | (Corr'd Nav, Kongsberg 14208, img#37) (V) (T.A) |
| 03-Apr-2023 | 04:31:00 | 1049 | ECR_ENV_17 | | | camera | 74 | 525686 | 6399962 | 525685 | 6399992 | 1 | -30 | 30 | -1 | PL | (Corr'd Nav, Kongsberg 14208, img#38) (V) (T.A) |
| 03-Apr-2023 | 04:31:07 | 1050 | ECR_ENV_17 | | | camera | 74 | 525686 | 6399962 | 525685 | 6399992 | 0 | -30 | 30 | -1 | PL | (Corr'd Nav, Kongsberg 14208, img#39) (V) (T.A) |
| 03-Apr-2023 | 04:31:24 | 1051 | ECR_ENV_17 | | | camera | 74 | 525686 | 6399960 | 525685 | 6399992 | 0 | -33 | 32 | 0 | PL | (Corr'd Nav, Kongsberg 14208, img#40) (V) (T.A) |
| 03-Apr-2023 | 04:31:40 | 1052 | ECR_ENV_17 | | | camera | 74 | 525687 | 6399957 | 525685 | 6399992 | 1 | -35 | 35 | -2 | PL | (Corr'd Nav, Kongsberg 14208, img#41) (V) (T.A) |
| 03-Apr-2023 | 04:32:24 | 1053 | ECR_ENV_17 | | | camera | 74 | 525688 | 6399952 | 525685 | 6399992 | 3 | -41 | 41 | -4 | PL | (Corr'd Nav, Kongsberg 14208, img#42) (V) (T.A) |
| 03-Apr-2023 | 04:32:56 | 1054 | ECR_ENV_17 | | | camera | 73 | 525686 | 6399946 | 525685 | 6399992 | 1 | -46 | 46 | -1 | PL | (Corr'd Nav, Kongsberg 14208, img#43) (V) (T.A) |
| 03-Apr-2023 | 04:33:01 | 1055 | ECR_ENV_17 | | | camera | 73 | 525686 | 6399946 | 525685 | 6399992 | 0 | -46 | 46 | 0 | PL | (Corr'd Nav, Kongsberg 14208, img#44) (V) (T.A) |
| 03-Apr-2023 | 15:11:47 | 1056 | ECR_ENV_26 | | | camera | 108 | 528566 | 6402549 | 528618 | 6402532 | -52 | 17 | 54 | 109 | SG | (Corr'd Nav, Kongsberg 14208, img#1) (V) (T.A) |
| 03-Apr-2023 | 15:12:16 | 1057 | ECR_ENV_26 | | | camera | 108 | 528570 | 6402548 | 528618 | 6402532 | -48 | 17 | 50 | 109 | SG | (Corr'd Nav, Kongsberg 14208, img#2) (V) (T.A) |
| 03-Apr-2023 | 15:12:31 | 1058 | ECR_ENV_26 | | | camera | 108 | 528573 | 6402548 | 528618 | 6402532 | -45 | 16 | 48 | 110 | SG | (Corr'd Nav, Kongsberg 14208, img#3) (V) (T.A) |
| 03-Apr-2023 | 15:12:49 | 1059 | ECR_ENV_26 | | | camera | 108 | 528576 | 6402548 | 528618 | 6402532 | -42 | 16 | 45 | 111 | SG | (Corr'd Nav, Kongsberg 14208, img#4) (V) (T.A) |
| 03-Apr-2023 | 15:12:57 | 1060 | ECR_ENV_26 | | | camera | 108 | 528577 | 6402548 | 528618 | 6402532 | -41 | 17 | 44 | 112 | SG | (Corr'd Nav, Kongsberg 14208, img#5) (V) (T.A) |
| 03-Apr-2023 | 15:13:15 | 1061 | ECR_ENV_26 | | | camera | 108 | 528580 | 6402548 | 528618 | 6402532 | -38 | 17 | 41 | 114 | SG | (Corr'd Nav, Kongsberg 14208, img#6) (V) (T.A) |
| 03-Apr-2023 | 15:13:35 | 1062 | ECR_ENV_26 | | | camera | 108 | 528584 | 6402548 | 528618 | 6402532 | -34 | 16 | 37 | 116 | SG | (Corr'd Nav, Kongsberg 14208, img#7) (V) (T.A) |
| 03-Apr-2023 | 15:13:51 | 1063 | ECR_ENV_26 | | | camera | 108 | 528587 | 6402549 | 528618 | 6402532 | -31 | 17 | 36 | 119 | SG | (Corr'd Nav, Kongsberg 14208, img#8) (V) (T.A) |
| 03-Apr-2023 | 15:14:18 | 1064 | ECR_ENV_26 | | | camera | 108 | 528588 | 6402549 | 528618 | 6402532 | -30 | 17 | 35 | 120 | SG | (Corr'd Nav, Kongsberg 14208, img#9) (V) (T.A) |
| 03-Apr-2023 | 15:14:41 | 1065 | ECR_ENV_26 | | | camera | 108 | 528591 | 6402548 | 528618 | 6402532 | -27 | 17 | 31 | 122 | SG | (Corr'd Nav, Kongsberg 14208, img#10) (V) (T.A) |
| 03-Apr-2023 | 15:15:09 | 1066 | ECR_ENV_26 | | | camera | 108 | 528594 | 6402549 | 528618 | 6402532 | -24 | 17 | 30 | 126 | SG | (Corr'd Nav, Kongsberg 14208, img#11) (V) (T.A) |
| 03-Apr-2023 | 15:15:28 | 1067 | ECR_ENV_26 | | | camera | 109 | 528596 | 6402547 | 528618 | 6402532 | -22 | 16 | 27 | 125 | SG | (Raw Nav, Kongsberg 14208, img#12) (V) |
| 03-Apr-2023 | 15:15:48 | 1067a | ECR_ENV_26 | | | camera | 108 | 528598 | 6402548 | 528618 | 6402532 | -20 | 16 | 26 | 130 | SG | (Corr'd Nav, Kongsberg 14208, img#13) (V) (T.A) # Double Fix |
| 03-Apr-2023 | 15:16:18 | 1068 | ECR_ENV_26 | | | camera | 108 | 528601 | 6402545 | 528618 | 6402532 | -17 | 13 | 22 | 127 | SG | (Corr'd Nav, Kongsberg 14208, img#14) (V) (T.A) |
| 03-Apr-2023 | 15:16:40 | 1069 | ECR_ENV_26 | | | camera | 108 | 528602 | 6402542 | 528618 | 6402532 | -16 | 11 | 19 | 123 | SG | (Corr'd Nav, Kongsberg 14208, img#15) (V) (T.A) |
| 03-Apr-2023 | 15:17:03 | 1070 | ECR_ENV_26 | | | camera | 108 | 528602 | 6402541 | 528618 | 6402532 | -16 | 9 | 18 | 121 | SG | (Corr'd Nav, Kongsberg 14208, img#16) (V) (T.A) |
| 03-Apr-2023 | 15:17:37 | 1071 | ECR_ENV_26 | | | camera | 109 | 528607 | 6402536 | 528618 | 6402532 | -11 | 4 | 12 | 111 | SG | (Corr'd Nav, Kongsberg 14208, img#17) (V) (T.A) |
| 03-Apr-2023 | 15:17:59 | 1072 | ECR_ENV_26 | | | camera | 109 | 528611 | 6402534 | 528618 | 6402532 | -7 | 2 | 7 | 108 | SG | (Corr'd Nav, Kongsberg 14208, img#18) (V) (T.A) |
| 03-Apr-2023 | 15:18:26 | 1073 | ECR_ENV_26 | | | camera | 109 | 528612 | 6402531 | 528618 | 6402532 | -6 | -1 | 6 | 82 | SG | (Corr'd Nav, Kongsberg 14208, img#19) (V) (T.A) |
| 03-Apr-2023 | 15:18:34 | 1074 | ECR_ENV_26 | | | camera | 109 | 528613 | 6402529 | 528618 | 6402532 | -5 | -2 | 6 | 67 | SG | (Corr'd Nav, Kongsberg 14208, img#20) (V) (T.A) |
| 03-Apr-2023 | 15:19:05 | 1075 | ECR_ENV_26 | | | camera | 109 | 528617 | 6402526 | 528618 | 6402532 | -1 | -6 | 6 | 12 | SG | (Corr'd Nav, Kongsberg 14208, img#21) (V) (T.A) |
| 03-Apr-2023 | 15:19:34 | 1076 | ECR_ENV_26 | | | camera | 109 | 528620 | 6402524 | 528618 | 6402532 | 2 | -8 | 8 | -17 | SG | (Corr'd Nav, Kongsberg 14208, img#22) (V) (T.A) |
| 03-Apr-2023 | 15:19:48 | 1077 | ECR_ENV_26 | | | camera | 109 | 528621 | 6402522 | 528618 | 6402532 | 4 | -10 | 10 | -20 | SG | (Corr'd Nav, Kongsberg 14208, img#23) (V) (T.A) |
| 03-Apr-2023 | 15:20:17 | 1078 | ECR_ENV_26 | | | camera | 109 | 528624 | 6402520 | 528618 | 6402532 | 6 | -12 | 13 | -26 | SG | (Corr'd Nav, Kongsberg 14208, img#24) (V) (T.A) |
| 03-Apr-2023 | 15:20:46 | 1079 | ECR_ENV_26 | | | camera | 109 | 528628 | 6402517 | 528618 | 6402532 | 10 | -15 | 18 | -34 | SG | (Corr'd Nav, Kongsberg 14208, img#25) (V) (T.A) |
| 03-Apr-2023 | 15:21:05 | 1080 | ECR_ENV_26 | | | camera | 109 | 528630 | 6402515 | 528618 | 6402532 | 12 | -17 | 21 | -35 | SG | (Corr'd Nav, Kongsberg 14208, img#26) (V) (T.A) |
| 03-Apr-2023 | 15:21:18 | 1081 | ECR_ENV_26 | | | camera | 109 | 528631 | 6402513 | 528618 | 6402532 | 13 | -19 | 23 | -35 | SG | (Corr'd Nav, Kongsberg 14208, img#27) (V) (T.A) |
| 03-Apr-2023 | 15:21:30 | 1082 | ECR_ENV_26 | | | camera | 109 | 528633 | 6402512 | 528618 | 6402532 | 15 | -20 | 25 | -37 | SG | (Corr'd Nav, Kongsberg 14208, img#28) (V) (T.A) |
| 03-Apr-2023 | 15:21:48 | 1083 | ECR_ENV_26 | | | camera | 109 | 528635 | 6402510 | 528618 | 6402532 | 17 | -21 | 27 | -39 | SG | (Corr'd Nav, Kongsberg 14208, img#29) (V) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | | Vertical / Tidal Datum | VORF, LAT | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 03-Apr-2023 | 15:21:54 | 1084 | ECR_ENV_26 | | | camera | 109 | 528636 | 6402510 | 528618 | 6402532 | 18 | -21 | 28 | -40 | SG | (Corr'd Nav, Kongsberg 14208, img#30) (V) (T.A) |
| 03-Apr-2023 | 15:22:05 | 1085 | ECR_ENV_26 | | | camera | 109 | 528637 | 6402509 | 528618 | 6402532 | 19 | -22 | 29 | -40 | SG | (Corr'd Nav, Kongsberg 14208, img#31) (V) (T.A) |
| 03-Apr-2023 | 15:22:16 | 1086 | ECR_ENV_26 | | | camera | 109 | 528637 | 6402508 | 528618 | 6402532 | 19 | -24 | 30 | -39 | SG | (Corr'd Nav, Kongsberg 14208, img#32) (V) (T.A) |
| 03-Apr-2023 | 15:22:28 | 1087 | ECR_ENV_26 | | | camera | 109 | 528637 | 6402507 | 528618 | 6402532 | 19 | -24 | 31 | -39 | SG | (Corr'd Nav, Kongsberg 14208, img#33) (V) (T.A) |
| 03-Apr-2023 | 15:22:39 | 1088 | ECR_ENV_26 | | | camera | 109 | 528638 | 6402507 | 528618 | 6402532 | 20 | -24 | 32 | -40 | SG | (Corr'd Nav, Kongsberg 14208, img#34) (V) (T.A) |
| 03-Apr-2023 | 15:22:51 | 1089 | ECR_ENV_26 | | | camera | 109 | 528640 | 6402506 | 528618 | 6402532 | 22 | -26 | 33 | -40 | SG | (Corr'd Nav, Kongsberg 14208, img#35) (V) (T.A) |
| 03-Apr-2023 | 15:23:13 | 1090 | ECR_ENV_26 | | | camera | 109 | 528642 | 6402504 | 528618 | 6402532 | 24 | -27 | 36 | -41 | SG | (Corr'd Nav, Kongsberg 14208, img#36) (V) (T.A) |
| 03-Apr-2023 | 15:23:33 | 1091 | ECR_ENV_26 | | | camera | 109 | 528644 | 6402503 | 528618 | 6402532 | 26 | -29 | 39 | -42 | SG | (Corr'd Nav, Kongsberg 14208, img#37) (V) (T.A) |
| 03-Apr-2023 | 15:23:50 | 1092 | ECR_ENV_26 | | | camera | 109 | 528645 | 6402500 | 528618 | 6402532 | 27 | -32 | 41 | -40 | SG | (Corr'd Nav, Kongsberg 14208, img#38) (V) (T.A) |
| 03-Apr-2023 | 15:23:57 | 1093 | ECR_ENV_26 | | | camera | 109 | 528645 | 6402499 | 528618 | 6402532 | 27 | -32 | 42 | -40 | SG | (Corr'd Nav, Kongsberg 14208, img#39) (V) (T.A) |
| 03-Apr-2023 | 15:24:28 | 1094 | ECR_ENV_26 | | | camera | 109 | 528649 | 6402496 | 528618 | 6402532 | 31 | -35 | 47 | -41 | SG | (Corr'd Nav, Kongsberg 14208, img#40) (V) (T.A) |
| 04-Apr-2023 | 04:35:25 | 1095 | ECR_ENV_21 | | | camera | 48 | 528147 | 6396819 | 528145 | 6396764 | 3 | 55 | 55 | -177 | PL | (Corr'd Nav, Kongsberg 14208, img#1) (V) (T.A) |
| 04-Apr-2023 | 04:35:45 | 1096 | ECR_ENV_21 | | | camera | 48 | 528146 | 6396817 | 528145 | 6396764 | 1 | 53 | 53 | -178 | PL | (Corr'd Nav, Kongsberg 14208, img#2) (V) (T.A) |
| 04-Apr-2023 | 04:36:07 | 1097 | ECR_ENV_21 | | | camera | 48 | 528144 | 6396815 | 528145 | 6396764 | -1 | 51 | 51 | 179 | PL | (Corr'd Nav, Kongsberg 14208, img#3) (V) (T.A) |
| 04-Apr-2023 | 04:36:19 | 1098 | ECR_ENV_21 | | | camera | 48 | 528142 | 6396814 | 528145 | 6396764 | -3 | 50 | 50 | 177 | PL | (Corr'd Nav, Kongsberg 14208, img#4) (V) (T.A) |
| 04-Apr-2023 | 04:36:52 | 1099 | ECR_ENV_21 | | | camera | 48 | 528142 | 6396811 | 528145 | 6396764 | -3 | 47 | 47 | 176 | PL | (Corr'd Nav, Kongsberg 14208, img#5) (V) (T.A) |
| 04-Apr-2023 | 04:37:02 | 1100 | ECR_ENV_21 | | | camera | 48 | 528142 | 6396809 | 528145 | 6396764 | -3 | 45 | 45 | 176 | PL | (Corr'd Nav, Kongsberg 14208, img#6) (V) (T.A) |
| 04-Apr-2023 | 04:37:13 | 1101 | ECR_ENV_21 | | | camera | 48 | 528141 | 6396807 | 528145 | 6396764 | -3 | 43 | 44 | 175 | PL | (Corr'd Nav, Kongsberg 14208, img#7) (V) (T.A) |
| 04-Apr-2023 | 04:37:34 | 1102 | ECR_ENV_21 | | | camera | 48 | 528142 | 6396805 | 528145 | 6396764 | -3 | 41 | 42 | 176 | PL | (Corr'd Nav, Kongsberg 14208, img#8) (V) (T.A) |
| 04-Apr-2023 | 04:37:51 | 1103 | ECR_ENV_21 | | | camera | 48 | 528143 | 6396803 | 528145 | 6396764 | -1 | 39 | 39 | 178 | PL | (Corr'd Nav, Kongsberg 14208, img#9) (V) (T.A) |
| 04-Apr-2023 | 04:38:06 | 1104 | ECR_ENV_21 | | | camera | 48 | 528144 | 6396800 | 528145 | 6396764 | -1 | 36 | 36 | 179 | PL | (Corr'd Nav, Kongsberg 14208, img#10) (V) (T.A) |
| 04-Apr-2023 | 04:38:25 | 1105 | ECR_ENV_21 | | | camera | 48 | 528145 | 6396799 | 528145 | 6396764 | 1 | 35 | 35 | -179 | PL | (Corr'd Nav, Kongsberg 14208, img#11) (V) (T.A) |
| 04-Apr-2023 | 04:38:59 | 1106 | ECR_ENV_21 | | | camera | 48 | 528146 | 6396795 | 528145 | 6396764 | 1 | 31 | 31 | -178 | PL | (Corr'd Nav, Kongsberg 14208, img#12) (V) (T.A) |
| 04-Apr-2023 | 04:39:07 | 1107 | ECR_ENV_21 | | | camera | 48 | 528146 | 6396793 | 528145 | 6396764 | 1 | 29 | 29 | -178 | PL | (Corr'd Nav, Kongsberg 14208, img#13) (V) (T.A) |
| 04-Apr-2023 | 04:39:14 | 1108 | ECR_ENV_21 | | | camera | 48 | 528146 | 6396792 | 528145 | 6396764 | 1 | 28 | 28 | -177 | PL | (Corr'd Nav, Kongsberg 14208, img#14) (V) (T.A) |
| 04-Apr-2023 | 04:39:41 | 1109 | ECR_ENV_21 | | | camera | 48 | 528147 | 6396788 | 528145 | 6396764 | 2 | 24 | 24 | -175 | PL | (Corr'd Nav, Kongsberg 14208, img#15) (V) (T.A) |
| 04-Apr-2023 | 04:39:51 | 1110 | ECR_ENV_21 | | | camera | 48 | 528146 | 6396787 | 528145 | 6396764 | 1 | 23 | 23 | -177 | PL | (Corr'd Nav, Kongsberg 14208, img#16) (V) (T.A) |
| 04-Apr-2023 | 04:40:06 | 1111 | ECR_ENV_21 | | | camera | 48 | 528145 | 6396785 | 528145 | 6396764 | 1 | 21 | 21 | -179 | PL | (Corr'd Nav, Kongsberg 14208, img#17) (V) (T.A) |
| 04-Apr-2023 | 04:41:00 | 1112 | ECR_ENV_21 | | | camera | 47 | 528144 | 6396780 | 528145 | 6396764 | -1 | 16 | 16 | 177 | PL | (Corr'd Nav, Kongsberg 14208, img#18) (V) (T.A) |
| 04-Apr-2023 | 04:41:32 | 1113 | ECR_ENV_21 | | | camera | 47 | 528143 | 6396775 | 528145 | 6396764 | -2 | 11 | 11 | 169 | PL | (Corr'd Nav, Kongsberg 14208, img#19) (V) (T.A) |
| 04-Apr-2023 | 04:41:54 | 1114 | ECR_ENV_21 | | | camera | 47 | 528143 | 6396774 | 528145 | 6396764 | -2 | 10 | 10 | 167 | PL | (Corr'd Nav, Kongsberg 14208, img#20) (V) (T.A) |
| 04-Apr-2023 | 04:42:29 | 1115 | ECR_ENV_21 | | | camera | 47 | 528145 | 6396768 | 528145 | 6396764 | 0 | 4 | 4 | 178 | PL | (Corr'd Nav, Kongsberg 14208, img#21) (V) (T.A) |
| 04-Apr-2023 | 04:42:51 | 1116 | ECR_ENV_21 | | | camera | 47 | 528146 | 6396766 | 528145 | 6396764 | 1 | 2 | 3 | -150 | PL | (Corr'd Nav, Kongsberg 14208, img#22) (V) (T.A) |
| 04-Apr-2023 | 04:43:35 | 1117 | ECR_ENV_21 | | | camera | 47 | 528145 | 6396763 | 528145 | 6396764 | 0 | -2 | 2 | -14 | PL | (Corr'd Nav, Kongsberg 14208, img#23) (V) (T.A) |
| 04-Apr-2023 | 04:43:49 | 1118 | ECR_ENV_21 | | | camera | 47 | 528145 | 6396760 | 528145 | 6396764 | 0 | -4 | 4 | 3 | PL | (Corr'd Nav, Kongsberg 14208, img#24) (V) (T.A) |
| 04-Apr-2023 | 04:44:03 | 1119 | ECR_ENV_21 | | | camera | 47 | 528144 | 6396758 | 528145 | 6396764 | 0 | -6 | 6 | 3 | PL | (Corr'd Nav, Kongsberg 14208, img#25) (V) (T.A) |
| 04-Apr-2023 | 04:44:23 | 1120 | ECR_ENV_21 | | | camera | 47 | 528145 | 6396756 | 528145 | 6396764 | 0 | -8 | 8 | -1 | PL | (Corr'd Nav, Kongsberg 14208, img#26) (V) (T.A) |
| 04-Apr-2023 | 04:44:51 | 1121 | ECR_ENV_21 | | | camera | 47 | 528145 | 6396753 | 528145 | 6396764 | 1 | -11 | 11 | -3 | PL | (Corr'd Nav, Kongsberg 14208, img#27) (V) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | | Vessel | MV *Ocean Endeavour* | | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | | Vessel Reference Point (VRP) | COG | | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 | |
| Primary Positioning System | Starpack 1 | | | | Actual Coordinates derived from | Vessel | | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | | Projection | UTM zone 30N | | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 04-Apr-2023 | 04:45:07 | 1122 | ECR_ENV_21 | | | camera | 47 | 528146 | 6396750 | 528145 | 6396764 | 1 | -14 | 14 | -3 | PL | (Corr'd Nav, Kongsberg 14208, img#28) (V) (T.A) |
| 04-Apr-2023 | 04:45:25 | 1123 | ECR_ENV_21 | | | camera | 47 | 528146 | 6396747 | 528145 | 6396764 | 1 | -17 | 17 | -5 | PL | (Corr'd Nav, Kongsberg 14208, img#29) (V) (T.A) |
| 04-Apr-2023 | 04:45:35 | 1124 | ECR_ENV_21 | | | camera | 47 | 528147 | 6396746 | 528145 | 6396764 | 2 | -18 | 18 | -6 | PL | (Corr'd Nav, Kongsberg 14208, img#30) (V) (T.A) |
| 04-Apr-2023 | 04:45:52 | 1125 | ECR_ENV_21 | | | camera | 47 | 528146 | 6396745 | 528145 | 6396764 | 2 | -20 | 20 | -4 | PL | (Corr'd Nav, Kongsberg 14208, img#31) (V) (T.A) |
| 04-Apr-2023 | 04:46:22 | 1126 | ECR_ENV_21 | | | camera | 47 | 528144 | 6396740 | 528145 | 6396764 | -1 | -24 | 24 | 2 | PL | (Corr'd Nav, Kongsberg 14208, img#32) (V) (T.A) |
| 04-Apr-2023 | 04:46:31 | 1127 | ECR_ENV_21 | | | camera | 46 | 528144 | 6396739 | 528145 | 6396764 | -1 | -25 | 25 | 3 | PL | (Corr'd Nav, Kongsberg 14208, img#33) (V) (T.A) |
| 04-Apr-2023 | 04:46:41 | 1128 | ECR_ENV_21 | | | camera | 46 | 528144 | 6396738 | 528145 | 6396764 | -1 | -26 | 26 | 2 | PL | (Corr'd Nav, Kongsberg 14208, img#34) (V) (T.A) |
| 04-Apr-2023 | 04:47:08 | 1129 | ECR_ENV_21 | | | camera | 46 | 528145 | 6396735 | 528145 | 6396764 | 0 | -30 | 30 | 0 | PL | (Corr'd Nav, Kongsberg 14208, img#35) (V) (T.A) |
| 04-Apr-2023 | 04:47:49 | 1130 | ECR_ENV_21 | | | camera | 46 | 528145 | 6396730 | 528145 | 6396764 | 0 | -34 | 34 | 0 | PL | (Corr'd Nav, Kongsberg 14208, img#36) (V) (T.A) |
| 04-Apr-2023 | 04:48:09 | 1131 | ECR_ENV_21 | | | camera | 46 | 528145 | 6396726 | 528145 | 6396764 | 0 | -38 | 38 | -1 | PL | (Corr'd Nav, Kongsberg 14208, img#37) (V) (T.A) |
| 04-Apr-2023 | 04:48:26 | 1132 | ECR_ENV_21 | | | camera | 46 | 528145 | 6396724 | 528145 | 6396764 | 1 | -40 | 40 | -1 | PL | (Corr'd Nav, Kongsberg 14208, img#38) (V) (T.A) |
| 04-Apr-2023 | 04:49:02 | 1133 | ECR_ENV_21 | | | camera | 46 | 528145 | 6396720 | 528145 | 6396764 | 0 | -44 | 44 | 0 | PL | (Corr'd Nav, Kongsberg 14208, img#39) (V) (T.A) |
| 04-Apr-2023 | 04:49:32 | 1134 | ECR_ENV_21 | | | camera | 46 | 528145 | 6396716 | 528145 | 6396764 | 1 | -48 | 48 | -1 | PL | (Corr'd Nav, Kongsberg 14208, img#40) (V) (T.A) |
| 04-Apr-2023 | 08:36:08 | 1135 | ECR_ENV_53 | | | camera | 27 | 525601 | 6394813 | 525615 | 6394765 | -15 | 48 | 50 | 163 | PL | (Corr'd Nav, Kongsberg 14208, img#1) (V) (T.A) |
| 04-Apr-2023 | 08:36:36 | 1136 | ECR_ENV_53 | | | camera | 27 | 525601 | 6394812 | 525615 | 6394765 | -14 | 47 | 49 | 163 | PL | (Corr'd Nav, Kongsberg 14208, img#2) (V) (T.A) |
| 04-Apr-2023 | 08:37:00 | 1137 | ECR_ENV_53 | | | camera | 27 | 525602 | 6394810 | 525615 | 6394765 | -13 | 45 | 47 | 164 | PL | (Corr'd Nav, Kongsberg 14208, img#3) (V) (T.A) |
| 04-Apr-2023 | 08:37:30 | 1138 | ECR_ENV_53 | | | camera | 27 | 525604 | 6394807 | 525615 | 6394765 | -12 | 42 | 44 | 164 | PL | (Corr'd Nav, Kongsberg 14208, img#4) (V) (T.A) |
| 04-Apr-2023 | 08:37:42 | 1139 | ECR_ENV_53 | | | camera | 27 | 525604 | 6394806 | 525615 | 6394765 | -12 | 40 | 42 | 164 | PL | (Corr'd Nav, Kongsberg 14208, img#5) (V) (T.A) |
| 04-Apr-2023 | 08:37:50 | 1140 | ECR_ENV_53 | | | camera | 27 | 525604 | 6394805 | 525615 | 6394765 | -11 | 40 | 41 | 164 | PL | (Corr'd Nav, Kongsberg 14208, img#6) (V) (T.A) |
| 04-Apr-2023 | 08:38:04 | 1141 | ECR_ENV_53 | | | camera | 27 | 525603 | 6394804 | 525615 | 6394765 | -12 | 39 | 40 | 162 | PL | (Corr'd Nav, Kongsberg 14208, img#7) (V) (T.A) |
| 04-Apr-2023 | 08:38:19 | 1142 | ECR_ENV_53 | | | camera | 27 | 525602 | 6394802 | 525615 | 6394765 | -13 | 37 | 39 | 161 | PL | (Corr'd Nav, Kongsberg 14208, img#8) (V) (T.A) |
| 04-Apr-2023 | 08:38:40 | 1143 | ECR_ENV_53 | | | camera | 27 | 525602 | 6394800 | 525615 | 6394765 | -13 | 35 | 37 | 160 | PL | (Corr'd Nav, Kongsberg 14208, img#9) (V) (T.A) |
| 04-Apr-2023 | 08:39:15 | 1144 | ECR_ENV_53 | | | camera | 27 | 525604 | 6394797 | 525615 | 6394765 | -11 | 32 | 34 | 161 | PL | (Corr'd Nav, Kongsberg 14208, img#10) (V) (T.A) |
| 04-Apr-2023 | 08:39:39 | 1145 | ECR_ENV_53 | | | camera | 27 | 525606 | 6394794 | 525615 | 6394765 | -10 | 29 | 31 | 162 | PL | (Corr'd Nav, Kongsberg 14208, img#11) (V) (T.A) |
| 04-Apr-2023 | 08:39:51 | 1146 | ECR_ENV_53 | | | camera | 27 | 525606 | 6394793 | 525615 | 6394765 | -9 | 28 | 30 | 162 | PL | (Corr'd Nav, Kongsberg 14208, img#12) (V) (T.A) |
| 04-Apr-2023 | 08:40:09 | 1147 | ECR_ENV_53 | | | camera | 27 | 525607 | 6394792 | 525615 | 6394765 | -8 | 27 | 28 | 162 | PL | (Corr'd Nav, Kongsberg 14208, img#13) (V) (T.A) |
| 04-Apr-2023 | 08:40:23 | 1148 | ECR_ENV_53 | | | camera | 27 | 525607 | 6394790 | 525615 | 6394765 | -8 | 25 | 26 | 163 | PL | (Corr'd Nav, Kongsberg 14208, img#14) (V) (T.A) |
| 04-Apr-2023 | 08:41:35 | 1149 | ECR_ENV_53 | | | camera | 27 | 525610 | 6394784 | 525615 | 6394765 | -5 | 19 | 20 | 166 | PL | (Corr'd Nav, Kongsberg 14208, img#15) (V) (T.A) |
| 04-Apr-2023 | 08:42:12 | 1150 | ECR_ENV_53 | | | camera | 27 | 525611 | 6394781 | 525615 | 6394765 | -4 | 16 | 16 | 165 | PL | (Corr'd Nav, Kongsberg 14208, img#16) (V) (T.A) |
| 04-Apr-2023 | 08:42:42 | 1151 | ECR_ENV_53 | | | camera | 27 | 525611 | 6394778 | 525615 | 6394765 | -4 | 12 | 13 | 162 | PL | (Corr'd Nav, Kongsberg 14208, img#17) (V) (T.A) |
| 04-Apr-2023 | 08:44:04 | 1152 | ECR_ENV_53 | | | camera | 27 | 525613 | 6394770 | 525615 | 6394765 | -2 | 4 | 5 | 154 | PL | (Corr'd Nav, Kongsberg 14208, img#18) (V) (T.A) |
| 04-Apr-2023 | 08:44:26 | 1153 | ECR_ENV_53 | | | camera | 27 | 525614 | 6394767 | 525615 | 6394765 | -1 | 2 | 2 | 148 | PL | (Corr'd Nav, Kongsberg 14208, img#19) (V) (T.A) |
| 04-Apr-2023 | 08:45:34 | 1154 | ECR_ENV_53 | | | camera | 28 | 525617 | 6394759 | 525615 | 6394765 | 2 | -6 | 6 | -17 | PL | (Corr'd Nav, Kongsberg 14208, img#20) (V) (T.A) |
| 04-Apr-2023 | 08:45:42 | 1155 | ECR_ENV_53 | | | camera | 28 | 525618 | 6394759 | 525615 | 6394765 | 2 | -6 | 7 | -20 | PL | (Corr'd Nav, Kongsberg 14208, img#21) (V) (T.A) |
| 04-Apr-2023 | 08:45:57 | 1156 | ECR_ENV_53 | | | camera | 28 | 525619 | 6394758 | 525615 | 6394765 | 3 | -7 | 8 | -25 | PL | (Corr'd Nav, Kongsberg 14208, img#22) (V) (T.A) |
| 04-Apr-2023 | 08:46:06 | 1157 | ECR_ENV_53 | | | camera | 28 | 525619 | 6394756 | 525615 | 6394765 | 4 | -9 | 10 | -25 | PL | (Corr'd Nav, Kongsberg 14208, img#23) (V) (T.A) |
| 04-Apr-2023 | 08:46:14 | 1158 | ECR_ENV_53 | | | camera | 28 | 525620 | 6394755 | 525615 | 6394765 | 4 | -10 | 11 | -24 | PL | (Corr'd Nav, Kongsberg 14208, img#24) (V) (T.A) |
| 04-Apr-2023 | 08:46:20 | 1159 | ECR_ENV_53 | | | camera | 28 | 525620 | 6394755 | 525615 | 6394765 | 5 | -11 | 11 | -23 | PL | (Corr'd Nav, Kongsberg 14208, img#25) (V) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 04-Apr-2023 | 08:46:39 | 1160 | ECR_ENV_53 | | | camera | 28 | 525621 | 6394753 | 525615 | 6394765 | 5 | -12 | 13 | -25 | PL | (Corr'd Nav, Kongsberg 14208, img#26) (V) (T.A) |
| 04-Apr-2023 | 08:46:59 | 1161 | ECR_ENV_53 | | | camera | 28 | 525621 | 6394751 | 525615 | 6394765 | 6 | -15 | 16 | -22 | PL | (Corr'd Nav, Kongsberg 14208, img#27) (V) (T.A) |
| 04-Apr-2023 | 08:47:16 | 1162 | ECR_ENV_53 | | | camera | 28 | 525620 | 6394749 | 525615 | 6394765 | 5 | -16 | 17 | -17 | PL | (Corr'd Nav, Kongsberg 14208, img#28) (V) (T.A) |
| 04-Apr-2023 | 08:47:21 | 1163 | ECR_ENV_53 | | | camera | 28 | 525620 | 6394749 | 525615 | 6394765 | 5 | -17 | 17 | -16 | PL | (Corr'd Nav, Kongsberg 14208, img#29) (V) (T.A) |
| 04-Apr-2023 | 08:47:45 | 1164 | ECR_ENV_53 | | | camera | 28 | 525620 | 6394746 | 525615 | 6394765 | 5 | -19 | 20 | -14 | PL | (Corr'd Nav, Kongsberg 14208, img#30) (V) (T.A) |
| 04-Apr-2023 | 08:48:02 | 1165 | ECR_ENV_53 | | | camera | 28 | 525620 | 6394745 | 525615 | 6394765 | 5 | -21 | 21 | -14 | PL | (Corr'd Nav, Kongsberg 14208, img#31) (V) (T.A) |
| 04-Apr-2023 | 08:48:23 | 1166 | ECR_ENV_53 | | | camera | 28 | 525621 | 6394742 | 525615 | 6394765 | 5 | -23 | 23 | -13 | PL | (Corr'd Nav, Kongsberg 14208, img#32) (V) (T.A) |
| 04-Apr-2023 | 08:48:31 | 1167 | ECR_ENV_53 | | | camera | 28 | 525621 | 6394742 | 525615 | 6394765 | 6 | -23 | 24 | -14 | PL | (Corr'd Nav, Kongsberg 14208, img#33) (V) (T.A) |
| 04-Apr-2023 | 08:48:49 | 1168 | ECR_ENV_53 | | | camera | 28 | 525622 | 6394739 | 525615 | 6394765 | 7 | -26 | 27 | -14 | PL | (Corr'd Nav, Kongsberg 14208, img#34) (V) (T.A) |
| 04-Apr-2023 | 08:49:24 | 1169 | ECR_ENV_53 | | | camera | 28 | 525623 | 6394737 | 525615 | 6394765 | 8 | -28 | 29 | -16 | PL | (Corr'd Nav, Kongsberg 14208, img#35) (V) (T.A) |
| 04-Apr-2023 | 08:50:18 | 1170 | ECR_ENV_53 | | | camera | 28 | 525626 | 6394734 | 525615 | 6394765 | 11 | -32 | 33 | -19 | PL | (Corr'd Nav, Kongsberg 14208, img#36) (V) (T.A) |
| 04-Apr-2023 | 08:50:34 | 1171 | ECR_ENV_53 | | | camera | 28 | 525628 | 6394732 | 525615 | 6394765 | 12 | -33 | 35 | -21 | PL | (Corr'd Nav, Kongsberg 14208, img#37) (V) (T.A) |
| 04-Apr-2023 | 08:51:17 | 1172 | ECR_ENV_53 | | | camera | 28 | 525631 | 6394727 | 525615 | 6394765 | 16 | -38 | 42 | -23 | PL | (Corr'd Nav, Kongsberg 14208, img#38) (V) (T.A) |
| 04-Apr-2023 | 08:51:22 | 1173 | ECR_ENV_53 | | | camera | 28 | 525632 | 6394727 | 525615 | 6394765 | 16 | -39 | 42 | -23 | PL | (Corr'd Nav, Kongsberg 14208, img#39) (V) (T.A) |
| 04-Apr-2023 | 08:51:28 | 1174 | ECR_ENV_53 | | | camera | 28 | 525632 | 6394726 | 525615 | 6394765 | 17 | -39 | 42 | -23 | PL | (Corr'd Nav, Kongsberg 14208, img#40) (V) (T.A) |
| 04-Apr-2023 | 08:51:38 | 1175 | ECR_ENV_53 | | | camera | 28 | 525633 | 6394725 | 525615 | 6394765 | 18 | -40 | 44 | -24 | PL | (Corr'd Nav, Kongsberg 14208, img#41) (V) (T.A) |
| 04-Apr-2023 | 08:51:50 | 1176 | ECR_ENV_53 | | | camera | 28 | 525634 | 6394724 | 525615 | 6394765 | 19 | -41 | 45 | -25 | PL | (Corr'd Nav, Kongsberg 14208, img#42) (V) (T.A) |
| 04-Apr-2023 | 08:52:00 | 1177 | ECR_ENV_53 | | | camera | 27 | 525635 | 6394724 | 525615 | 6394765 | 20 | -42 | 46 | -25 | PL | (Corr'd Nav, Kongsberg 14208, img#43) (V) (T.A) |
| 04-Apr-2023 | 08:52:05 | 1178 | ECR_ENV_53 | | | camera | 28 | 525635 | 6394723 | 525615 | 6394765 | 20 | -42 | 46 | -26 | PL | (Corr'd Nav, Kongsberg 14208, img#44) (V) (T.A) |
| 04-Apr-2023 | 08:52:19 | 1179 | ECR_ENV_53 | | | camera | 28 | 525637 | 6394722 | 525615 | 6394765 | 22 | -43 | 48 | -27 | PL | (Corr'd Nav, Kongsberg 14208, img#45) (V) (T.A) |
| 04-Apr-2023 | 11:07:10 | 1180 | ECR_ENV_01 | | | camera | 31 | 527994 | 6394904 | 527943 | 6394889 | 51 | 15 | 53 | -106 | PL | (Corr'd Nav, Kongsberg 14208, img#1) (V) (T.A) |
| 04-Apr-2023 | 11:07:25 | 1181 | ECR_ENV_01 | | | camera | 31 | 527994 | 6394905 | 527943 | 6394889 | 51 | 16 | 53 | -108 | PL | (Corr'd Nav, Kongsberg 14208, img#2) (V) (T.A) |
| 04-Apr-2023 | 11:07:38 | 1182 | ECR_ENV_01 | | | camera | 31 | 527992 | 6394907 | 527943 | 6394889 | 50 | 19 | 53 | -111 | PL | (Corr'd Nav, Kongsberg 14208, img#3) (V) (T.A) |
| 04-Apr-2023 | 11:08:05 | 1183 | ECR_ENV_01 | | | camera | 31 | 527989 | 6394907 | 527943 | 6394889 | 47 | 19 | 50 | -112 | PL | (Corr'd Nav, Kongsberg 14208, img#4) (V) (T.A) |
| 04-Apr-2023 | 11:08:17 | 1184 | ECR_ENV_01 | | | camera | 31 | 527986 | 6394907 | 527943 | 6394889 | 44 | 19 | 47 | -113 | PL | (Corr'd Nav, Kongsberg 14208, img#5) (V) (T.A) |
| 04-Apr-2023 | 11:08:41 | 1185 | ECR_ENV_01 | | | camera | 31 | 527981 | 6394906 | 527943 | 6394889 | 38 | 17 | 42 | -114 | PL | (Corr'd Nav, Kongsberg 14208, img#6) (V) (T.A) |
| 04-Apr-2023 | 11:08:52 | 1186 | ECR_ENV_01 | | | camera | 31 | 527979 | 6394904 | 527943 | 6394889 | 37 | 16 | 40 | -113 | PL | (Corr'd Nav, Kongsberg 14208, img#7) (V) (T.A) |
| 04-Apr-2023 | 11:09:01 | 1187 | ECR_ENV_01 | | | camera | 31 | 527977 | 6394903 | 527943 | 6394889 | 34 | 14 | 37 | -112 | PL | (Corr'd Nav, Kongsberg 14208, img#8) (V) (T.A) |
| 04-Apr-2023 | 11:09:14 | 1188 | ECR_ENV_01 | | | camera | 31 | 527975 | 6394901 | 527943 | 6394889 | 32 | 13 | 34 | -112 | PL | (Corr'd Nav, Kongsberg 14208, img#9) (V) (T.A) |
| 04-Apr-2023 | 11:09:26 | 1189 | ECR_ENV_01 | | | camera | 31 | 527973 | 6394901 | 527943 | 6394889 | 31 | 12 | 33 | -112 | PL | (Corr'd Nav, Kongsberg 14208, img#10) (V) (T.A) |
| 04-Apr-2023 | 11:09:37 | 1190 | ECR_ENV_01 | | | camera | 31 | 527973 | 6394900 | 527943 | 6394889 | 30 | 12 | 32 | -111 | PL | (Corr'd Nav, Kongsberg 14208, img#11) (V) (T.A) |
| 04-Apr-2023 | 11:09:53 | 1191 | ECR_ENV_01 | | | camera | 31 | 527971 | 6394899 | 527943 | 6394889 | 28 | 11 | 30 | -111 | PL | (Corr'd Nav, Kongsberg 14208, img#12) (V) (T.A) |
| 04-Apr-2023 | 11:10:07 | 1192 | ECR_ENV_01 | | | camera | 31 | 527969 | 6394898 | 527943 | 6394889 | 27 | 10 | 28 | -110 | PL | (Corr'd Nav, Kongsberg 14208, img#13) (V) (T.A) |
| 04-Apr-2023 | 11:10:27 | 1193 | ECR_ENV_01 | | | camera | 31 | 527966 | 6394896 | 527943 | 6394889 | 24 | 8 | 25 | -108 | PL | (Corr'd Nav, Kongsberg 14208, img#14) (V) (T.A) |
| 04-Apr-2023 | 11:10:39 | 1194 | ECR_ENV_01 | | | camera | 31 | 527965 | 6394896 | 527943 | 6394889 | 22 | 7 | 23 | -107 | PL | (Corr'd Nav, Kongsberg 14208, img#15) (V) (T.A) |
| 04-Apr-2023 | 11:10:55 | 1195 | ECR_ENV_01 | | | camera | 31 | 527962 | 6394895 | 527943 | 6394889 | 20 | 7 | 21 | -109 | PL | (Corr'd Nav, Kongsberg 14208, img#16) (V) (T.A) |
| 04-Apr-2023 | 11:11:11 | 1196 | ECR_ENV_01 | | | camera | 31 | 527960 | 6394895 | 527943 | 6394889 | 17 | 7 | 19 | -112 | PL | (Corr'd Nav, Kongsberg 14208, img#17) (V) (T.A) |
| 04-Apr-2023 | 11:11:24 | 1197 | ECR_ENV_01 | | | camera | 31 | 527958 | 6394896 | 527943 | 6394889 | 15 | 7 | 17 | -115 | PL | (Corr'd Nav, Kongsberg 14208, img#18) (V) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 04-Apr-2023 | 11:11:46 | 1198 | ECR_ENV_01 | | | camera | 31 | 527955 | 6394895 | 527943 | 6394889 | 12 | 7 | 14 | -119 | PL | (Corr'd Nav, Kongsberg 14208, img#19) (V) (T.A) |
| 04-Apr-2023 | 11:12:06 | 1199 | ECR_ENV_01 | | | camera | 31 | 527952 | 6394893 | 527943 | 6394889 | 10 | 4 | 11 | -115 | PL | (Corr'd Nav, Kongsberg 14208, img#20) (V) (T.A) |
| 04-Apr-2023 | 11:12:28 | 1200 | ECR_ENV_01 | | | camera | 31 | 527951 | 6394890 | 527943 | 6394889 | 8 | 2 | 8 | -104 | PL | (Corr'd Nav, Kongsberg 14208, img#21) (V) (T.A) |
| 04-Apr-2023 | 11:12:43 | 1201 | ECR_ENV_01 | | | camera | 31 | 527948 | 6394889 | 527943 | 6394889 | 6 | 1 | 6 | -99 | PL | (Corr'd Nav, Kongsberg 14208, img#22) (V) (T.A) |
| 04-Apr-2023 | 11:12:52 | 1202 | ECR_ENV_01 | | | camera | 31 | 527948 | 6394889 | 527943 | 6394889 | 5 | 0 | 5 | -91 | PL | (Corr'd Nav, Kongsberg 14208, img#23) (V) (T.A) |
| 04-Apr-2023 | 11:13:20 | 1203 | ECR_ENV_01 | | | camera | 31 | 527946 | 6394888 | 527943 | 6394889 | 3 | 0 | 3 | -89 | PL | (Corr'd Nav, Kongsberg 14208, img#24) (V) (T.A) |
| 04-Apr-2023 | 11:13:50 | 1204 | ECR_ENV_01 | | | camera | 31 | 527944 | 6394891 | 527943 | 6394889 | 2 | 3 | 3 | -145 | PL | (Corr'd Nav, Kongsberg 14208, img#25) (V) (T.A) |
| 04-Apr-2023 | 11:15:21 | 1205 | ECR_ENV_01 | | | camera | 31 | 527946 | 6394889 | 527943 | 6394889 | 3 | 1 | 3 | -100 | PL | (Corr'd Nav, Kongsberg 14208, img#26) (V) (T.A) |
| 04-Apr-2023 | 11:16:00 | 1206 | ECR_ENV_01 | | | camera | 31 | 527945 | 6394889 | 527943 | 6394889 | 3 | 0 | 3 | -92 | PL | (Corr'd Nav, Kongsberg 14208, img#27) (V) (T.A) |
| 04-Apr-2023 | 11:16:34 | 1207 | ECR_ENV_01 | | | camera | 31 | 527943 | 6394886 | 527943 | 6394889 | 1 | -3 | 3 | -11 | PL | (Corr'd Nav, Kongsberg 14208, img#28) (V) (T.A) |
| 04-Apr-2023 | 11:17:05 | 1208 | ECR_ENV_01 | | | camera | 31 | 527939 | 6394884 | 527943 | 6394889 | -4 | -5 | 6 | 38 | PL | (Corr'd Nav, Kongsberg 14208, img#29) (V) (T.A) |
| 04-Apr-2023 | 11:17:30 | 1209 | ECR_ENV_01 | | | camera | 31 | 527938 | 6394881 | 527943 | 6394889 | -5 | -7 | 9 | 34 | PL | (Corr'd Nav, Kongsberg 14208, img#30) (V) (T.A) |
| 04-Apr-2023 | 11:17:51 | 1210 | ECR_ENV_01 | | | camera | 31 | 527935 | 6394879 | 527943 | 6394889 | -8 | -9 | 12 | 42 | PL | (Corr'd Nav, Kongsberg 14208, img#31) (V) (T.A) |
| 04-Apr-2023 | 11:18:27 | 1211 | ECR_ENV_01 | | | camera | 31 | 527932 | 6394877 | 527943 | 6394889 | -10 | -11 | 15 | 42 | PL | (Corr'd Nav, Kongsberg 14208, img#32) (V) (T.A) |
| 04-Apr-2023 | 11:18:52 | 1212 | ECR_ENV_01 | | | camera | 31 | 527928 | 6394872 | 527943 | 6394889 | -14 | -16 | 21 | 42 | PL | (Corr'd Nav, Kongsberg 14208, img#33) (V) (T.A) |
| 04-Apr-2023 | 11:19:03 | 1213 | ECR_ENV_01 | | | camera | 31 | 527928 | 6394870 | 527943 | 6394889 | -15 | -18 | 23 | 40 | PL | (Corr'd Nav, Kongsberg 14208, img#34) (V) (T.A) |
| 04-Apr-2023 | 11:19:14 | 1214 | ECR_ENV_01 | | | camera | 31 | 527927 | 6394870 | 527943 | 6394889 | -16 | -19 | 24 | 39 | PL | (Corr'd Nav, Kongsberg 14208, img#35) (V) (T.A) |
| 04-Apr-2023 | 11:19:29 | 1215 | ECR_ENV_01 | | | camera | 31 | 527925 | 6394870 | 527943 | 6394889 | -18 | -19 | 26 | 44 | PL | (Corr'd Nav, Kongsberg 14208, img#36) (V) (T.A) |
| 04-Apr-2023 | 11:19:45 | 1216 | ECR_ENV_01 | | | camera | 31 | 527922 | 6394868 | 527943 | 6394889 | -20 | -20 | 29 | 45 | PL | (Corr'd Nav, Kongsberg 14208, img#37) (V) (T.A) |
| 04-Apr-2023 | 11:19:56 | 1217 | ECR_ENV_01 | | | camera | 31 | 527921 | 6394867 | 527943 | 6394889 | -21 | -22 | 30 | 44 | PL | (Corr'd Nav, Kongsberg 14208, img#38) (V) (T.A) |
| 04-Apr-2023 | 11:20:09 | 1218 | ECR_ENV_01 | | | camera | 31 | 527921 | 6394865 | 527943 | 6394889 | -21 | -24 | 32 | 42 | PL | (Corr'd Nav, Kongsberg 14208, img#39) (V) (T.A) |
| 04-Apr-2023 | 11:20:31 | 1219 | ECR_ENV_01 | | | camera | 31 | 527919 | 6394862 | 527943 | 6394889 | -24 | -26 | 36 | 42 | PL | (Corr'd Nav, Kongsberg 14208, img#40) (V) (T.A) |
| 04-Apr-2023 | 11:20:50 | 1220 | ECR_ENV_01 | | | camera | 31 | 527916 | 6394862 | 527943 | 6394889 | -27 | -27 | 38 | 45 | PL | (Corr'd Nav, Kongsberg 14208, img#41) (V) (T.A) |
| 04-Apr-2023 | 11:21:13 | 1221 | ECR_ENV_01 | | | camera | 31 | 527913 | 6394858 | 527943 | 6394889 | -30 | -30 | 42 | 45 | PL | (Corr'd Nav, Kongsberg 14208, img#42) (V) (T.A) |
| 04-Apr-2023 | 11:21:49 | 1222 | ECR_ENV_01 | | | camera | 31 | 527910 | 6394855 | 527943 | 6394889 | -33 | -33 | 47 | 45 | PL | (Corr'd Nav, Kongsberg 14208, img#43) (V) (T.A) |
| 04-Apr-2023 | 13:38:10 | 1223 | ECR_ENV_54 | | | camera | 95 | 528222 | 6399867 | 528222 | 6399816 | 0 | 51 | 51 | -180 | SG | (Corr'd Nav, Kongsberg 14208, img#44) (V) (T.A) |
| 04-Apr-2023 | | 1224 | ECR_ENV_54 | | | camera | | | | | | | | | | SG | Lost connection with EELS, no Fix taken |
| 04-Apr-2023 | | 1225 | ECR_ENV_54 | | | camera | | | | | | | | | | SG | Lost connection with EELS, no Fix taken |
| 04-Apr-2023 | | 1226 | ECR_ENV_54 | | | camera | | | | | | | | | | SG | Lost connection with EELS, no Fix taken |
| 04-Apr-2023 | | 1227 | ECR_ENV_54 | | | camera | | | | | | | | | | SG | Lost connection with EELS, no Fix taken |
| 04-Apr-2023 | | 1228 | ECR_ENV_54 | | | camera | | | | | | | | | | SG | Lost connection with EELS, no Fix taken |
| 04-Apr-2023 | 13:40:35 | 1229 | ECR_ENV_54 | | | camera | 95 | 528223 | 6399853 | 528222 | 6399816 | 1 | 37 | 37 | -178 | SG | (Corr'd Nav, Kongsberg 14208, img#50) (V) (T.A) |
| 04-Apr-2023 | 13:40:50 | 1230 | ECR_ENV_54 | | | camera | 95 | 528226 | 6399850 | 528222 | 6399816 | 4 | 35 | 35 | -173 | SG | (Corr'd Nav, Kongsberg 14208, img#51) (V) (T.A) |
| 04-Apr-2023 | 13:41:06 | 1231 | ECR_ENV_54 | | | camera | 95 | 528228 | 6399849 | 528222 | 6399816 | 6 | 33 | 34 | -169 | SG | (Corr'd Nav, Kongsberg 14208, img#52) (V) (T.A) |
| 04-Apr-2023 | 13:41:22 | 1232 | ECR_ENV_54 | | | camera | 95 | 528227 | 6399849 | 528222 | 6399816 | 5 | 33 | 33 | -172 | SG | (Corr'd Nav, Kongsberg 14208, img#53) (V) (T.A) |
| 04-Apr-2023 | 13:41:51 | 1233 | ECR_ENV_54 | | | camera | 95 | 528225 | 6399846 | 528222 | 6399816 | 3 | 30 | 30 | -174 | SG | (Corr'd Nav, Kongsberg 14208, img#54) (V) (T.A) |
| 04-Apr-2023 | 13:42:11 | 1234 | ECR_ENV_54 | | | camera | 96 | 528224 | 6399844 | 528222 | 6399816 | 2 | 28 | 28 | -176 | SG | (Corr'd Nav, Kongsberg 14208, img#55) (V) (T.A) |
| 04-Apr-2023 | 13:42:29 | 1235 | ECR_ENV_54 | | | camera | 96 | 528223 | 6399841 | 528222 | 6399816 | 1 | 25 | 25 | -177 | SG | (Corr'd Nav, Kongsberg 14208, img#56) (V) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | | Vertical / Tidal Datum | VORF, LAT | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 04-Apr-2023 | 13:42:55 | 1236 | ECR_ENV_54 | | | camera | 96 | 528223 | 6399839 | 528222 | 6399816 | 1 | 23 | 23 | -177 | SG | (Corr'd Nav, Kongsberg 14208, img#57) (V) (T.A) |
| 04-Apr-2023 | 13:43:16 | 1237 | ECR_ENV_54 | | | camera | 96 | 528222 | 6399835 | 528222 | 6399816 | 0 | 19 | 19 | -179 | SG | (Corr'd Nav, Kongsberg 14208, img#58) (V) (T.A) |
| 04-Apr-2023 | 13:43:27 | 1238 | ECR_ENV_54 | | | camera | 95 | 528222 | 6399833 | 528222 | 6399816 | 1 | 17 | 17 | -178 | SG | (Corr'd Nav, Kongsberg 14208, img#59) (V) (T.A) |
| 04-Apr-2023 | 13:43:55 | 1239 | ECR_ENV_54 | | | camera | 95 | 528223 | 6399831 | 528222 | 6399816 | 1 | 15 | 15 | -175 | SG | (Corr'd Nav, Kongsberg 14208, img#60) (V) (T.A) |
| 04-Apr-2023 | 13:44:23 | 1240 | ECR_ENV_54 | | | camera | 95 | 528223 | 6399827 | 528222 | 6399816 | 1 | 11 | 11 | -175 | SG | (Corr'd Nav, Kongsberg 14208, img#61) (V) (T.A) |
| 04-Apr-2023 | 13:44:41 | 1241 | ECR_ENV_54 | | | camera | 97 | 528224 | 6399824 | 528222 | 6399816 | 2 | 8 | 8 | -169 | SG | (Corr'd Nav, Kongsberg 14208, img#62) (V) (T.A) |
| 04-Apr-2023 | 13:45:11 | 1242 | ECR_ENV_54 | | | camera | 97 | 528223 | 6399822 | 528222 | 6399816 | 1 | 6 | 6 | -170 | SG | (Corr'd Nav, Kongsberg 14208, img#63) (V) (T.A) |
| 04-Apr-2023 | 13:45:36 | 1243 | ECR_ENV_54 | | | camera | 97 | 528224 | 6399820 | 528222 | 6399816 | 2 | 4 | 4 | -155 | SG | (Corr'd Nav, Kongsberg 14208, img#64) (V) (T.A) |
| 04-Apr-2023 | 13:46:12 | 1244 | ECR_ENV_54 | | | camera | 97 | 528222 | 6399817 | 528222 | 6399816 | 0 | 1 | 1 | -157 | SG | (Corr'd Nav, Kongsberg 14208, img#65) (V) (T.A) |
| 04-Apr-2023 | 13:46:32 | 1245 | ECR_ENV_54 | | | camera | 97 | 528224 | 6399816 | 528222 | 6399816 | 2 | 0 | 2 | -76 | SG | (Corr'd Nav, Kongsberg 14208, img#66) (V) (T.A) |
| 04-Apr-2023 | 13:48:08 | 1246 | ECR_ENV_54 | | | camera | 97 | 528223 | 6399819 | 528222 | 6399816 | 1 | 3 | 3 | -163 | SG | (Corr'd Nav, Kongsberg 14208, img#67) (V) (T.A) |
| 04-Apr-2023 | 13:49:43 | 1247 | ECR_ENV_54 | | | camera | 97 | 528218 | 6399817 | 528222 | 6399816 | -4 | 1 | 4 | 111 | SG | (Corr'd Nav, Kongsberg 14208, img#68) (V) (T.A) |
| 04-Apr-2023 | 13:51:47 | 1248 | ECR_ENV_54 | | | camera | 97 | 528218 | 6399815 | 528222 | 6399816 | -4 | -1 | 4 | 75 | SG | (Corr'd Nav, Kongsberg 14208, img#69) (V) (T.A) |
| 04-Apr-2023 | 13:53:02 | 1249 | ECR_ENV_54 | | | camera | 97 | 528224 | 6399815 | 528222 | 6399816 | 2 | -1 | 2 | -77 | SG | (Corr'd Nav, Kongsberg 14208, img#70) (V) (T.A) |
| 04-Apr-2023 | 13:55:36 | 1250 | ECR_ENV_54 | | | camera | 97 | 528223 | 6399815 | 528222 | 6399816 | 1 | -1 | 1 | -44 | SG | (Corr'd Nav, Kongsberg 14208, img#71) (V) (T.A) |
| 04-Apr-2023 | 13:55:58 | 1251 | ECR_ENV_54 | | | camera | 97 | 528223 | 6399811 | 528222 | 6399816 | 1 | -5 | 5 | -11 | SG | (Corr'd Nav, Kongsberg 14208, img#72) (V) (T.A) |
| 04-Apr-2023 | 13:56:27 | 1252 | ECR_ENV_54 | | | camera | 97 | 528223 | 6399808 | 528222 | 6399816 | 1 | -8 | 9 | -9 | SG | (Corr'd Nav, Kongsberg 14208, img#73) (V) (T.A) |
| 04-Apr-2023 | 13:56:33 | 1253 | ECR_ENV_54 | | | camera | 97 | 528223 | 6399806 | 528222 | 6399816 | 1 | -10 | 10 | -7 | SG | (Corr'd Nav, Kongsberg 14208, img#74) (V) (T.A) |
| 04-Apr-2023 | 13:57:25 | 1254 | ECR_ENV_54 | | | camera | 97 | 528225 | 6399806 | 528222 | 6399816 | 3 | -10 | 10 | -15 | SG | (Corr'd Nav, Kongsberg 14208, img#75) (V) (T.A) |
| 04-Apr-2023 | 13:57:39 | 1255 | ECR_ENV_54 | | | camera | 97 | 528224 | 6399807 | 528222 | 6399816 | 2 | -9 | 10 | -13 | SG | (Corr'd Nav, Kongsberg 14208, img#76) (V) (T.A) |
| 04-Apr-2023 | 13:57:54 | 1256 | ECR_ENV_54 | | | camera | 97 | 528223 | 6399805 | 528222 | 6399816 | 1 | -11 | 11 | -6 | SG | (Corr'd Nav, Kongsberg 14208, img#77) (V) (T.A) |
| 04-Apr-2023 | 13:58:19 | 1257 | ECR_ENV_54 | | | camera | 97 | 528224 | 6399802 | 528222 | 6399816 | 3 | -14 | 14 | -10 | SG | (Corr'd Nav, Kongsberg 14208, img#78) (V) (T.A) |
| 04-Apr-2023 | 14:04:23 | 1258 | ECR_ENV_54 | | | camera | 97 | 528219 | 6399813 | 528222 | 6399816 | -3 | -3 | 4 | 46 | SG | (Corr'd Nav, Kongsberg 14208, img#79) (V) (T.A) |
| 04-Apr-2023 | 14:05:40 | 1259 | ECR_ENV_54 | | | camera | 97 | 528216 | 6399806 | 528222 | 6399816 | -6 | -10 | 12 | 31 | SG | (Corr'd Nav, Kongsberg 14208, img#80) (V) (T.A) |
| 04-Apr-2023 | 14:05:50 | 1260 | ECR_ENV_54 | | | camera | 97 | 528217 | 6399803 | 528222 | 6399816 | -5 | -13 | 14 | 22 | SG | (Corr'd Nav, Kongsberg 14208, img#81) (V) (T.A) |
| 04-Apr-2023 | 14:05:56 | 1261 | ECR_ENV_54 | | | camera | 97 | 528217 | 6399802 | 528222 | 6399816 | -4 | -14 | 15 | 17 | SG | (Corr'd Nav, Kongsberg 14208, img#82) (V) (T.A) |
| 04-Apr-2023 | 14:06:02 | 1262 | ECR_ENV_54 | | | camera | 97 | 528218 | 6399801 | 528222 | 6399816 | -4 | -15 | 15 | 13 | SG | (Corr'd Nav, Kongsberg 14208, img#83) (V) (T.A) |
| 04-Apr-2023 | 14:06:09 | 1263 | ECR_ENV_54 | | | camera | 97 | 528219 | 6399800 | 528222 | 6399816 | -3 | -16 | 16 | 10 | SG | (Corr'd Nav, Kongsberg 14208, img#84) (V) (T.A) |
| 04-Apr-2023 | 14:06:24 | 1264 | ECR_ENV_54 | | | camera | 97 | 528220 | 6399799 | 528222 | 6399816 | -1 | -17 | 17 | 5 | SG | (Corr'd Nav, Kongsberg 14208, img#85) (V) (T.A) |
| 04-Apr-2023 | 14:06:31 | 1265 | ECR_ENV_54 | | | camera | 97 | 528221 | 6399799 | 528222 | 6399816 | -1 | -17 | 17 | 4 | SG | (Corr'd Nav, Kongsberg 14208, img#86) (V) (T.A) |
| 04-Apr-2023 | 14:07:08 | 1266 | ECR_ENV_54 | | | camera | 97 | 528224 | 6399801 | 528222 | 6399816 | 2 | -15 | 15 | -9 | SG | (Corr'd Nav, Kongsberg 14208, img#87) (V) (T.A) |
| 04-Apr-2023 | 14:07:19 | 1267 | ECR_ENV_54 | | | camera | 97 | 528225 | 6399801 | 528222 | 6399816 | 3 | -15 | 16 | -12 | SG | (Corr'd Nav, Kongsberg 14208, img#88) (V) (T.A) |
| 04-Apr-2023 | 14:08:00 | 1268 | ECR_ENV_54 | | | camera | 96 | 528223 | 6399798 | 528222 | 6399816 | 1 | -18 | 18 | -4 | SG | (Corr'd Nav, Kongsberg 14208, img#89) (V) (T.A) |
| 04-Apr-2023 | 14:08:31 | 1269 | ECR_ENV_54 | | | camera | 97 | 528224 | 6399793 | 528222 | 6399816 | 2 | -23 | 23 | -4 | SG | (Corr'd Nav, Kongsberg 14208, img#90) (V) (T.A) |
| 04-Apr-2023 | 14:08:49 | 1270 | ECR_ENV_54 | | | camera | 96 | 528223 | 6399790 | 528222 | 6399816 | 1 | -26 | 26 | -2 | SG | (Corr'd Nav, Kongsberg 14208, img#91) (V) (T.A) |
| 04-Apr-2023 | 14:09:11 | 1271 | ECR_ENV_54 | | | camera | 96 | 528224 | 6399787 | 528222 | 6399816 | 2 | -29 | 29 | -4 | SG | (Corr'd Nav, Kongsberg 14208, img#92) (V) (T.A) |
| 04-Apr-2023 | 14:09:30 | 1272 | ECR_ENV_54 | | | camera | 95 | 528225 | 6399786 | 528222 | 6399816 | 3 | -30 | 30 | -6 | SG | (Corr'd Nav, Kongsberg 14208, img#93) (V) (T.A) |
| 04-Apr-2023 | 14:10:10 | 1273 | ECR_ENV_54 | | | camera | 95 | 528224 | 6399780 | 528222 | 6399816 | 2 | -36 | 36 | -3 | SG | (Corr'd Nav, Kongsberg 14208, img#94) (V) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | | Vessel | MV *Ocean Endeavour* | | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | | Vessel Reference Point (VRP) | COG | | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 | |
| Primary Positioning System | Starpack 1 | | | | Actual Coordinates derived from | Vessel | | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | | Projection | UTM zone 30N | | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 04-Apr-2023 | 14:10:42 | 1274 | ECR_ENV_54 | | | camera | 94 | 528225 | 6399775 | 528222 | 6399816 | 3 | -41 | 41 | -4 | SG | (Corr'd Nav, Kongsberg 14208, img#95) (V) (T.A) |
| 04-Apr-2023 | 14:11:00 | 1275 | ECR_ENV_54 | | | camera | 94 | 528225 | 6399773 | 528222 | 6399816 | 3 | -43 | 43 | -5 | SG | (Corr'd Nav, Kongsberg 14208, img#96) (V) (T.A) |
| 04-Apr-2023 | 15:08:04 | 1276 | ECR_ENV_55 | | | camera | 106 | 526601 | 6403015 | 526580 | 6402950 | 21 | 65 | 69 | -163 | SG | (Corr'd Nav, Kongsberg 14208, img#97) (V) (T.A) |
| 04-Apr-2023 | 15:08:41 | 1277 | ECR_ENV_55 | | | camera | 106 | 526600 | 6403011 | 526580 | 6402950 | 20 | 62 | 65 | -162 | SG | (Corr'd Nav, Kongsberg 14208, img#98) (V) (T.A) |
| 04-Apr-2023 | 15:08:55 | 1278 | ECR_ENV_55 | | | camera | 106 | 526599 | 6403009 | 526580 | 6402950 | 19 | 59 | 62 | -163 | SG | (Corr'd Nav, Kongsberg 14208, img#99) (V) (T.A) |
| 04-Apr-2023 | 15:09:59 | 1279 | ECR_ENV_55 | | | camera | 106 | 526595 | 6403003 | 526580 | 6402950 | 14 | 53 | 55 | -165 | SG | (Corr'd Nav, Kongsberg 14208, img#100) (V) (T.A) |
| 04-Apr-2023 | 15:10:54 | 1280 | ECR_ENV_55 | | | camera | 106 | 526593 | 6402995 | 526580 | 6402950 | 13 | 46 | 47 | -164 | SG | (Corr'd Nav, Kongsberg 14208, img#101) (V) (T.A) |
| 04-Apr-2023 | 15:11:13 | 1281 | ECR_ENV_55 | | | camera | 106 | 526592 | 6402993 | 526580 | 6402950 | 11 | 43 | 44 | -165 | SG | (Corr'd Nav, Kongsberg 14208, img#102) (V) (T.A) |
| 04-Apr-2023 | 15:11:25 | 1282 | ECR_ENV_55 | | | camera | 106 | 526592 | 6402991 | 526580 | 6402950 | 12 | 41 | 43 | -164 | SG | (Corr'd Nav, Kongsberg 14208, img#103) (V) (T.A) |
| 04-Apr-2023 | 15:11:48 | 1283 | ECR_ENV_55 | | | camera | 106 | 526591 | 6402987 | 526580 | 6402950 | 11 | 37 | 39 | -164 | SG | (Corr'd Nav, Kongsberg 14208, img#104) (V) (T.A) |
| 04-Apr-2023 | 15:12:07 | 1284 | ECR_ENV_55 | | | camera | 106 | 526591 | 6402985 | 526580 | 6402950 | 11 | 35 | 37 | -163 | SG | (Corr'd Nav, Kongsberg 14208, img#105) (V) (T.A) |
| 04-Apr-2023 | 15:12:26 | 1285 | ECR_ENV_55 | | | camera | 106 | 526590 | 6402982 | 526580 | 6402950 | 10 | 32 | 34 | -163 | SG | (Corr'd Nav, Kongsberg 14208, img#106) (V) (T.A) |
| 04-Apr-2023 | 15:12:40 | 1286 | ECR_ENV_55 | | | camera | 106 | 526590 | 6402980 | 526580 | 6402950 | 10 | 31 | 32 | -162 | SG | (Corr'd Nav, Kongsberg 14208, img#107) (V) (T.A) |
| 04-Apr-2023 | 15:12:53 | 1287 | ECR_ENV_55 | | | camera | 106 | 526590 | 6402979 | 526580 | 6402950 | 9 | 29 | 30 | -162 | SG | (Corr'd Nav, Kongsberg 14208, img#108) (V) (T.A) |
| 04-Apr-2023 | 15:13:07 | 1288 | ECR_ENV_55 | | | camera | 106 | 526588 | 6402976 | 526580 | 6402950 | 8 | 27 | 28 | -163 | SG | (Corr'd Nav, Kongsberg 14208, img#109) (V) (T.A) |
| 04-Apr-2023 | 15:13:50 | 1289 | ECR_ENV_55 | | | camera | 106 | 526588 | 6402971 | 526580 | 6402950 | 8 | 21 | 23 | -159 | SG | (Corr'd Nav, Kongsberg 14208, img#110) (V) (T.A) |
| 04-Apr-2023 | 15:14:16 | 1290 | ECR_ENV_55 | | | camera | 107 | 526587 | 6402967 | 526580 | 6402950 | 7 | 18 | 19 | -160 | SG | (Corr'd Nav, Kongsberg 14208, img#111) (V) (T.A) |
| 04-Apr-2023 | 15:14:47 | 1291 | ECR_ENV_55 | | | camera | 107 | 526585 | 6402963 | 526580 | 6402950 | 5 | 13 | 14 | -161 | SG | (Corr'd Nav, Kongsberg 14208, img#112) (V) (T.A) |
| 04-Apr-2023 | 15:15:33 | 1292 | ECR_ENV_55 | | | camera | 107 | 526583 | 6402960 | 526580 | 6402950 | 2 | 10 | 10 | -166 | SG | (Corr'd Nav, Kongsberg 14208, img#113) (V) (T.A) |
| 04-Apr-2023 | 15:16:38 | 1293 | ECR_ENV_55 | | | camera | 108 | 526581 | 6402956 | 526580 | 6402950 | 1 | 6 | 6 | -172 | SG | (Corr'd Nav, Kongsberg 14208, img#114) (V) (T.A) |
| 04-Apr-2023 | 15:16:59 | 1294 | ECR_ENV_55 | | | camera | 108 | 526580 | 6402954 | 526580 | 6402950 | 0 | 4 | 4 | 177 | SG | (Corr'd Nav, Kongsberg 14208, img#115) (V) (T.A) |
| 04-Apr-2023 | 15:17:08 | 1295 | ECR_ENV_55 | | | camera | 108 | 526580 | 6402954 | 526580 | 6402950 | 0 | 4 | 4 | 176 | SG | (Corr'd Nav, Kongsberg 14208, img#116) (V) (T.A) |
| 04-Apr-2023 | 15:17:29 | 1296 | ECR_ENV_55 | | | camera | 108 | 526580 | 6402954 | 526580 | 6402950 | 0 | 4 | 4 | 179 | SG | (Corr'd Nav, Kongsberg 14208, img#117) (V) (T.A) |
| 04-Apr-2023 | 15:18:54 | 1297 | ECR_ENV_55 | | | camera | 108 | 526581 | 6402954 | 526580 | 6402950 | 1 | 5 | 5 | -164 | SG | (Corr'd Nav, Kongsberg 14208, img#118) (V) (T.A) |
| 04-Apr-2023 | 15:19:56 | 1298 | ECR_ENV_55 | | | camera | 107 | 526582 | 6402954 | 526580 | 6402950 | 1 | 5 | 5 | -163 | SG | (Corr'd Nav, Kongsberg 14208, img#119) (V) (T.A) |
| 04-Apr-2023 | 15:20:46 | 1299 | ECR_ENV_55 | | | camera | 108 | 526582 | 6402950 | 526580 | 6402950 | 2 | 0 | 2 | -104 | SG | (Corr'd Nav, Kongsberg 14208, img#120) (V) (T.A) |
| 04-Apr-2023 | 15:21:51 | 1300 | ECR_ENV_55 | | | camera | 108 | 526586 | 6402948 | 526580 | 6402950 | 6 | -2 | 6 | -72 | SG | (Corr'd Nav, Kongsberg 14208, img#121) (V) (T.A) |
| 04-Apr-2023 | 15:23:50 | 1301 | ECR_ENV_55 | | | camera | 108 | 526582 | 6402945 | 526580 | 6402950 | 1 | -5 | 5 | -15 | SG | (Corr'd Nav, Kongsberg 14208, img#122) (V) (T.A) |
| 04-Apr-2023 | 15:25:34 | 1302 | ECR_ENV_55 | | | camera | 108 | 526581 | 6402945 | 526580 | 6402950 | 1 | -5 | 5 | -9 | SG | (Corr'd Nav, Kongsberg 14208, img#123) (V) (T.A) |
| 04-Apr-2023 | 15:30:23 | 1303 | ECR_ENV_55 | | | camera | 108 | 526584 | 6402949 | 526580 | 6402950 | 3 | -1 | 4 | -72 | SG | (Corr'd Nav, Kongsberg 14208, img#124) (V) (T.A) |
| 04-Apr-2023 | 15:31:14 | 1304 | ECR_ENV_55 | | | camera | 108 | 526582 | 6402946 | 526580 | 6402950 | 2 | -4 | 4 | -27 | SG | (Corr'd Nav, Kongsberg 14208, img#125) (V) (T.A) |
| 04-Apr-2023 | 15:32:40 | 1305 | ECR_ENV_55 | | | camera | 108 | 526580 | 6402943 | 526580 | 6402950 | -1 | -7 | 7 | 5 | SG | (Corr'd Nav, Kongsberg 14208, img#126) (V) (T.A) |
| 04-Apr-2023 | 15:33:32 | 1306 | ECR_ENV_55 | | | camera | 108 | 526579 | 6402945 | 526580 | 6402950 | -1 | -4 | 4 | 10 | SG | (Corr'd Nav, Kongsberg 14208, img#127) (V) (T.A) |
| 04-Apr-2023 | 15:35:18 | 1307 | ECR_ENV_55 | | | camera | 108 | 526582 | 6402945 | 526580 | 6402950 | 2 | -5 | 5 | -18 | SG | (Corr'd Nav, Kongsberg 14208, img#128) (V) (T.A) |
| 04-Apr-2023 | 15:35:47 | 1308 | ECR_ENV_55 | | | camera | 108 | 526585 | 6402944 | 526580 | 6402950 | 5 | -6 | 8 | -40 | SG | (Corr'd Nav, Kongsberg 14208, img#129) (V) (T.A) |
| 04-Apr-2023 | 15:35:56 | 1309 | ECR_ENV_55 | | | camera | 108 | 526585 | 6402944 | 526580 | 6402950 | 5 | -6 | 8 | -39 | SG | (Corr'd Nav, Kongsberg 14208, img#130) (V) (T.A) |
| 04-Apr-2023 | 15:36:11 | 1310 | ECR_ENV_55 | | | camera | 108 | 526586 | 6402944 | 526580 | 6402950 | 6 | -6 | 9 | -46 | SG | (Corr'd Nav, Kongsberg 14208, img#131) (V) (T.A) |
| 04-Apr-2023 | 15:36:36 | 1311 | ECR_ENV_55 | | | camera | 108 | 526586 | 6402943 | 526580 | 6402950 | 6 | -7 | 9 | -41 | SG | (Corr'd Nav, Kongsberg 14208, img#132) (V) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 | | |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | | Vertical / Tidal Datum | VORF, LAT | | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 04-Apr-2023 | 15:36:43 | 1312 | ECR_ENV_55 | | | camera | 108 | 526584 | 6402943 | 526580 | 6402950 | 4 | -7 | 8 | -32 | SG | (Corr'd Nav, Kongsberg 14208, img#133) (V) (T.A) |
| 04-Apr-2023 | 15:37:26 | 1313 | ECR_ENV_55 | | | camera | 108 | 526586 | 6402946 | 526580 | 6402950 | 6 | -4 | 7 | -54 | SG | (Corr'd Nav, Kongsberg 14208, img#134) (V) (T.A) |
| 04-Apr-2023 | 15:37:55 | 1314 | ECR_ENV_55 | | | camera | 108 | 526583 | 6402945 | 526580 | 6402950 | 3 | -5 | 5 | -30 | SG | (Corr'd Nav, Kongsberg 14208, img#135) (V) (T.A) |
| 04-Apr-2023 | 15:38:47 | 1315 | ECR_ENV_55 | | | camera | 108 | 526577 | 6402941 | 526580 | 6402950 | -3 | -9 | 9 | 19 | SG | (Corr'd Nav, Kongsberg 14208, img#136) (V) (T.A) |
| 04-Apr-2023 | 15:39:24 | 1316 | ECR_ENV_55 | | | camera | 108 | 526573 | 6402937 | 526580 | 6402950 | -7 | -13 | 14 | 30 | SG | (Corr'd Nav, Kongsberg 14208, img#137) (V) (T.A) |
| 04-Apr-2023 | 15:40:31 | 1317 | ECR_ENV_55 | | | camera | 108 | 526568 | 6402931 | 526580 | 6402950 | -12 | -19 | 22 | 34 | SG | (Corr'd Nav, Kongsberg 14208, img#138) (V) (T.A) |
| 04-Apr-2023 | 15:40:48 | 1318 | ECR_ENV_55 | | | camera | 108 | 526566 | 6402929 | 526580 | 6402950 | -14 | -21 | 25 | 33 | SG | (Corr'd Nav, Kongsberg 14208, img#139) (V) (T.A) |
| 04-Apr-2023 | 15:40:56 | 1319 | ECR_ENV_55 | | | camera | 108 | 526566 | 6402928 | 526580 | 6402950 | -15 | -22 | 26 | 33 | SG | (Corr'd Nav, Kongsberg 14208, img#140) (V) (T.A) |
| 04-Apr-2023 | 15:41:26 | 1320 | ECR_ENV_55 | | | camera | 108 | 526564 | 6402926 | 526580 | 6402950 | -16 | -24 | 29 | 33 | SG | (Corr'd Nav, Kongsberg 14208, img#141) (V) (T.A) |
| 04-Apr-2023 | 15:42:00 | 1321 | ECR_ENV_55 | | | camera | 108 | 526560 | 6402922 | 526580 | 6402950 | -20 | -28 | 35 | 36 | SG | (Corr'd Nav, Kongsberg 14208, img#142) (V) (T.A) |
| 04-Apr-2023 | 15:42:32 | 1322 | ECR_ENV_55 | | | camera | 107 | 526558 | 6402920 | 526580 | 6402950 | -22 | -29 | 37 | 37 | SG | (Corr'd Nav, Kongsberg 14208, img#143) (V) (T.A) |
| 04-Apr-2023 | 15:43:08 | 1323 | ECR_ENV_55 | | | camera | 107 | 526554 | 6402916 | 526580 | 6402950 | -27 | -34 | 43 | 38 | SG | (Corr'd Nav, Kongsberg 14208, img#144) (V) (T.A) |
| 04-Apr-2023 | 15:43:42 | 1324 | ECR_ENV_55 | | | camera | 106 | 526550 | 6402913 | 526580 | 6402950 | -30 | -37 | 48 | 39 | SG | (Corr'd Nav, Kongsberg 14208, img#145) (V) (T.A) |
| 04-Apr-2023 | 16:47:03 | 1325 | ECR_ENV_02 | | | camera | 87 | 525001 | 6404726 | 525003 | 6404670 | -1 | 56 | 56 | 179 | SG | (Corr'd Nav, Kongsberg 14208, img#1) (V) (T.A) |
| 04-Apr-2023 | 16:47:20 | 1326 | ECR_ENV_02 | | | camera | 87 | 525001 | 6404724 | 525003 | 6404670 | -2 | 53 | 53 | 178 | SG | (Corr'd Nav, Kongsberg 14208, img#2) (V) (T.A) |
| 04-Apr-2023 | 16:48:01 | 1327 | ECR_ENV_02 | | | camera | 87 | 525002 | 6404719 | 525003 | 6404670 | -1 | 49 | 49 | 179 | SG | (Corr'd Nav, Kongsberg 14208, img#3) (V) (T.A) |
| 04-Apr-2023 | 16:48:33 | 1328 | ECR_ENV_02 | | | camera | 87 | 525003 | 6404715 | 525003 | 6404670 | 1 | 44 | 44 | -179 | SG | (Corr'd Nav, Kongsberg 14208, img#4) (V) (T.A) |
| 04-Apr-2023 | 16:48:44 | 1329 | ECR_ENV_02 | | | camera | 87 | 525003 | 6404713 | 525003 | 6404670 | 0 | 43 | 43 | -179 | SG | (Corr'd Nav, Kongsberg 14208, img#5) (V) (T.A) |
| 04-Apr-2023 | 16:49:09 | 1330 | ECR_ENV_02 | | | camera | 87 | 525003 | 6404710 | 525003 | 6404670 | 0 | 40 | 40 | -180 | SG | (Corr'd Nav, Kongsberg 14208, img#6) (V) (T.A) |
| 04-Apr-2023 | 16:49:26 | 1331 | ECR_ENV_02 | | | camera | 87 | 525002 | 6404708 | 525003 | 6404670 | -1 | 38 | 38 | 178 | SG | (Corr'd Nav, Kongsberg 14208, img#7) (V) (T.A) |
| 04-Apr-2023 | 16:49:33 | 1332 | ECR_ENV_02 | | | camera | 87 | 525001 | 6404707 | 525003 | 6404670 | -1 | 36 | 36 | 178 | SG | (Corr'd Nav, Kongsberg 14208, img#8) (V) (T.A) |
| 04-Apr-2023 | 16:49:44 | 1333 | ECR_ENV_02 | | | camera | 87 | 525001 | 6404705 | 525003 | 6404670 | -1 | 35 | 35 | 178 | SG | (Corr'd Nav, Kongsberg 14208, img#9) (V) (T.A) |
| 04-Apr-2023 | 16:50:12 | 1334 | ECR_ENV_02 | | | camera | 87 | 525002 | 6404702 | 525003 | 6404670 | 0 | 31 | 31 | 179 | SG | (Corr'd Nav, Kongsberg 14208, img#10) (V) (T.A) |
| 04-Apr-2023 | 16:50:47 | 1335 | ECR_ENV_02 | | | camera | 87 | 525002 | 6404698 | 525003 | 6404670 | -1 | 28 | 28 | 178 | SG | (Corr'd Nav, Kongsberg 14208, img#11) (V) (T.A) |
| 04-Apr-2023 | 16:51:16 | 1336 | ECR_ENV_02 | | | camera | 87 | 525002 | 6404694 | 525003 | 6404670 | 0 | 23 | 23 | 179 | SG | (Corr'd Nav, Kongsberg 14208, img#12) (V) (T.A) |
| 04-Apr-2023 | 16:51:50 | 1337 | ECR_ENV_02 | | | camera | 87 | 525001 | 6404692 | 525003 | 6404670 | -2 | 21 | 21 | 176 | SG | (Corr'd Nav, Kongsberg 14208, img#13) (V) (T.A) |
| 04-Apr-2023 | 16:52:38 | 1338 | ECR_ENV_02 | | | camera | 87 | 525002 | 6404689 | 525003 | 6404670 | -1 | 19 | 19 | 178 | SG | (Corr'd Nav, Kongsberg 14208, img#14) (V) (T.A) |
| 04-Apr-2023 | 16:53:12 | 1339 | ECR_ENV_02 | | | camera | 87 | 525002 | 6404686 | 525003 | 6404670 | 0 | 15 | 15 | 179 | SG | (Corr'd Nav, Kongsberg 14208, img#15) (V) (T.A) |
| 04-Apr-2023 | 16:53:43 | 1340 | ECR_ENV_02 | | | camera | 87 | 525003 | 6404681 | 525003 | 6404670 | 1 | 11 | 11 | -177 | SG | (Corr'd Nav, Kongsberg 14208, img#16) (V) (T.A) |
| 04-Apr-2023 | 16:54:43 | 1341 | ECR_ENV_02 | | | camera | 87 | 525004 | 6404673 | 525003 | 6404670 | 1 | 3 | 3 | -163 | SG | (Corr'd Nav, Kongsberg 14208, img#17) (V) (T.A) |
| 04-Apr-2023 | 16:54:58 | 1342 | ECR_ENV_02 | | | camera | 87 | 525003 | 6404671 | 525003 | 6404670 | 0 | 0 | 1 | -132 | SG | (Corr'd Nav, Kongsberg 14208, img#18) (V) (T.A) |
| 04-Apr-2023 | 16:55:29 | 1343 | ECR_ENV_02 | | | camera | 87 | 525003 | 6404666 | 525003 | 6404670 | 0 | -4 | 4 | -6 | SG | (Corr'd Nav, Kongsberg 14208, img#19) (V) (T.A) |
| 04-Apr-2023 | 16:55:47 | 1344 | ECR_ENV_02 | | | camera | 87 | 525002 | 6404663 | 525003 | 6404670 | 0 | -7 | 7 | 2 | SG | (Corr'd Nav, Kongsberg 14208, img#20) (V) (T.A) |
| 04-Apr-2023 | 16:56:02 | 1345 | ECR_ENV_02 | | | camera | 87 | 525002 | 6404662 | 525003 | 6404670 | 0 | -9 | 9 | 3 | SG | (Corr'd Nav, Kongsberg 14208, img#21) (V) (T.A) |
| 04-Apr-2023 | 16:56:26 | 1346 | ECR_ENV_02 | | | camera | 87 | 525004 | 6404660 | 525003 | 6404670 | 1 | -10 | 10 | -7 | SG | (Corr'd Nav, Kongsberg 14208, img#22) (V) (T.A) |
| 04-Apr-2023 | 16:56:49 | 1347 | ECR_ENV_02 | | | camera | 87 | 525003 | 6404657 | 525003 | 6404670 | 0 | -13 | 13 | 0 | SG | (Corr'd Nav, Kongsberg 14208, img#23) (V) (T.A) |
| 04-Apr-2023 | 16:57:17 | 1348 | ECR_ENV_02 | | | camera | 87 | 525003 | 6404652 | 525003 | 6404670 | 0 | -18 | 18 | -1 | SG | (Corr'd Nav, Kongsberg 14208, img#24) (V) (T.A) |
| 04-Apr-2023 | 16:57:36 | 1349 | ECR_ENV_02 | | | camera | 87 | 525003 | 6404651 | 525003 | 6404670 | 1 | -19 | 19 | -2 | SG | (Corr'd Nav, Kongsberg 14208, img#25) (V) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 04-Apr-2023 | 16:57:45 | 1350 | ECR_ENV_02 | | | camera | 87 | 525004 | 6404650 | 525003 | 6404670 | 1 | -20 | 20 | -4 | SG | (Corr'd Nav, Kongsberg 14208, img#26) (V) (T.A) |
| 04-Apr-2023 | 16:58:00 | 1351 | ECR_ENV_02 | | | camera | 87 | 525004 | 6404648 | 525003 | 6404670 | 1 | -22 | 22 | -2 | SG | (Corr'd Nav, Kongsberg 14208, img#27) (V) (T.A) |
| 04-Apr-2023 | 16:58:12 | 1352 | ECR_ENV_02 | | | camera | 87 | 525003 | 6404646 | 525003 | 6404670 | 0 | -24 | 24 | 0 | SG | (Corr'd Nav, Kongsberg 14208, img#28) (V) (T.A) |
| 04-Apr-2023 | 16:58:31 | 1353 | ECR_ENV_02 | | | camera | 87 | 525004 | 6404643 | 525003 | 6404670 | 1 | -28 | 28 | -3 | SG | (Corr'd Nav, Kongsberg 14208, img#29) (V) (T.A) |
| 04-Apr-2023 | 16:58:51 | 1354 | ECR_ENV_02 | | | camera | 87 | 525003 | 6404640 | 525003 | 6404670 | 0 | -31 | 31 | -1 | SG | (Corr'd Nav, Kongsberg 14208, img#30) (V) (T.A) |
| 04-Apr-2023 | 16:59:07 | 1355 | ECR_ENV_02 | | | camera | 87 | 525003 | 6404638 | 525003 | 6404670 | 0 | -32 | 32 | -1 | SG | (Corr'd Nav, Kongsberg 14208, img#31) (V) (T.A) |
| 04-Apr-2023 | 16:59:16 | 1356 | ECR_ENV_02 | | | camera | 87 | 525003 | 6404637 | 525003 | 6404670 | 1 | -33 | 33 | -1 | SG | (Corr'd Nav, Kongsberg 14208, img#32) (V) (T.A) |
| 04-Apr-2023 | 16:59:39 | 1357 | ECR_ENV_02 | | | camera | 87 | 525004 | 6404634 | 525003 | 6404670 | 1 | -36 | 36 | -1 | SG | (Corr'd Nav, Kongsberg 14208, img#33) (V) (T.A) |
| 04-Apr-2023 | 17:00:00 | 1358 | ECR_ENV_02 | | | camera | 87 | 525002 | 6404632 | 525003 | 6404670 | -1 | -38 | 38 | 1 | SG | (Corr'd Nav, Kongsberg 14208, img#34) (V) (T.A) |
| 04-Apr-2023 | 17:00:09 | 1359 | ECR_ENV_02 | | | camera | 87 | 525001 | 6404630 | 525003 | 6404670 | -1 | -40 | 40 | 2 | SG | (Corr'd Nav, Kongsberg 14208, img#35) (V) (T.A) |
| 04-Apr-2023 | 17:00:16 | 1360 | ECR_ENV_02 | | | camera | 87 | 525001 | 6404629 | 525003 | 6404670 | -2 | -41 | 41 | 2 | SG | (Corr'd Nav, Kongsberg 14208, img#36) (V) (T.A) |
| 04-Apr-2023 | 17:00:27 | 1361 | ECR_ENV_02 | | | camera | 87 | 525002 | 6404627 | 525003 | 6404670 | -1 | -43 | 43 | 2 | SG | (Corr'd Nav, Kongsberg 14208, img#37) (V) (T.A) |
| 04-Apr-2023 | 17:00:42 | 1362 | ECR_ENV_02 | | | camera | 87 | 525002 | 6404625 | 525003 | 6404670 | 0 | -46 | 46 | 1 | SG | (Corr'd Nav, Kongsberg 14208, img#38) (V) (T.A) |
| 04-Apr-2023 | 17:01:00 | 1363 | ECR_ENV_02 | | | camera | 87 | 525003 | 6404623 | 525003 | 6404670 | 0 | -47 | 47 | 0 | SG | (Corr'd Nav, Kongsberg 14208, img#39) (V) (T.A) |
| 05-Apr-2023 | 00:07:08 | 1364 | ECR_ENV_14 | | | camera | 69 | 528174 | 6404809 | 528139 | 6404768 | 36 | 41 | 54 | -139 | PL | (Corr'd Nav, Kongsberg 14208, img#1) (V) (T.A) |
| 05-Apr-2023 | 00:07:18 | 1365 | ECR_ENV_14 | | | camera | 69 | 528176 | 6404808 | 528139 | 6404768 | 37 | 39 | 54 | -136 | PL | (Corr'd Nav, Kongsberg 14208, img#2) (V) (T.A) |
| 05-Apr-2023 | 00:07:38 | 1366 | ECR_ENV_14 | | | camera | 69 | 528177 | 6404806 | 528139 | 6404768 | 38 | 38 | 54 | -134 | PL | (Corr'd Nav, Kongsberg 14208, img#3) (V) (T.A) |
| 05-Apr-2023 | 00:07:43 | 1367 | ECR_ENV_14 | | | camera | 68 | 528177 | 6404806 | 528139 | 6404768 | 39 | 37 | 53 | -134 | PL | (Corr'd Nav, Kongsberg 14208, img#4) (V) (T.A) |
| 05-Apr-2023 | 00:08:01 | 1368 | ECR_ENV_14 | | | camera | 69 | 528176 | 6404806 | 528139 | 6404768 | 38 | 38 | 53 | -135 | PL | (Corr'd Nav, Kongsberg 14208, img#5) (V) (T.A) |
| 05-Apr-2023 | 00:08:36 | 1369 | ECR_ENV_14 | | | camera | 68 | 528179 | 6404804 | 528139 | 6404768 | 40 | 36 | 54 | -132 | PL | (Corr'd Nav, Kongsberg 14208, img#6) (V) (T.A) |
| 05-Apr-2023 | 00:08:44 | 1370 | ECR_ENV_14 | | | camera | 68 | 528179 | 6404804 | 528139 | 6404768 | 40 | 35 | 53 | -131 | PL | (Corr'd Nav, Kongsberg 14208, img#7) (V) (T.A) |
| 05-Apr-2023 | 00:08:51 | 1371 | ECR_ENV_14 | | | camera | 68 | 528178 | 6404804 | 528139 | 6404768 | 39 | 36 | 53 | -132 | PL | (Corr'd Nav, Kongsberg 14208, img#8) (V) (T.A) |
| 05-Apr-2023 | 00:09:18 | 1372 | ECR_ENV_14 | | | camera | 68 | 528175 | 6404804 | 528139 | 6404768 | 37 | 35 | 51 | -134 | PL | (Corr'd Nav, Kongsberg 14208, img#9) (V) (T.A) |
| 05-Apr-2023 | 00:09:53 | 1373 | ECR_ENV_14 | | | camera | 68 | 528171 | 6404799 | 528139 | 6404768 | 32 | 31 | 44 | -133 | PL | (Corr'd Nav, Kongsberg 14208, img#10) (V) (T.A) |
| 05-Apr-2023 | 00:09:57 | 1374 | ECR_ENV_14 | | | camera | 68 | 528170 | 6404798 | 528139 | 6404768 | 32 | 30 | 44 | -133 | PL | (Corr'd Nav, Kongsberg 14208, img#11) (V) (T.A) |
| 05-Apr-2023 | 00:10:06 | 1375 | ECR_ENV_14 | | | camera | 68 | 528170 | 6404797 | 528139 | 6404768 | 31 | 28 | 42 | -133 | PL | (Corr'd Nav, Kongsberg 14208, img#12) (V) (T.A) |
| 05-Apr-2023 | 00:10:36 | 1376 | ECR_ENV_14 | | | camera | 68 | 528165 | 6404793 | 528139 | 6404768 | 26 | 25 | 36 | -133 | PL | (Corr'd Nav, Kongsberg 14208, img#13) (V) (T.A) |
| 05-Apr-2023 | 00:11:08 | 1377 | ECR_ENV_14 | | | camera | 68 | 528166 | 6404790 | 528139 | 6404768 | 27 | 22 | 35 | -129 | PL | (Corr'd Nav, Kongsberg 14208, img#14) (V) (T.A) |
| 05-Apr-2023 | 00:11:17 | 1378 | ECR_ENV_14 | | | camera | 68 | 528165 | 6404789 | 528139 | 6404768 | 26 | 21 | 34 | -128 | PL | (Corr'd Nav, Kongsberg 14208, img#15) (V) (T.A) |
| 05-Apr-2023 | 00:11:31 | 1379 | ECR_ENV_14 | | | camera | 68 | 528163 | 6404789 | 528139 | 6404768 | 25 | 21 | 32 | -130 | PL | (Corr'd Nav, Kongsberg 14208, img#16) (V) (T.A) |
| 05-Apr-2023 | 00:12:02 | 1380 | ECR_ENV_14 | | | camera | 67 | 528160 | 6404788 | 528139 | 6404768 | 21 | 19 | 29 | -132 | PL | (Corr'd Nav, Kongsberg 14208, img#17) (V) (T.A) |
| 05-Apr-2023 | 00:12:13 | 1381 | ECR_ENV_14 | | | camera | 67 | 528159 | 6404786 | 528139 | 6404768 | 20 | 18 | 27 | -132 | PL | (Corr'd Nav, Kongsberg 14208, img#18) (V) (T.A) |
| 05-Apr-2023 | 00:13:06 | 1382 | ECR_ENV_14 | | | camera | 67 | 528153 | 6404783 | 528139 | 6404768 | 15 | 14 | 20 | -134 | PL | (Corr'd Nav, Kongsberg 14208, img#19) (V) (T.A) |
| 05-Apr-2023 | 00:13:13 | 1383 | ECR_ENV_14 | | | camera | 67 | 528153 | 6404782 | 528139 | 6404768 | 14 | 13 | 19 | -133 | PL | (Corr'd Nav, Kongsberg 14208, img#20) (V) (T.A) |
| 05-Apr-2023 | 00:13:33 | 1384 | ECR_ENV_14 | | | camera | 67 | 528153 | 6404779 | 528139 | 6404768 | 14 | 10 | 18 | -126 | PL | (Corr'd Nav, Kongsberg 14208, img#21) (V) (T.A) |
| 05-Apr-2023 | 00:13:44 | 1385 | ECR_ENV_14 | | | camera | 67 | 528153 | 6404778 | 528139 | 6404768 | 14 | 9 | 17 | -124 | PL | (Corr'd Nav, Kongsberg 14208, img#22) (V) (T.A) |
| 05-Apr-2023 | 00:13:53 | 1386 | ECR_ENV_14 | | | camera | 67 | 528152 | 6404777 | 528139 | 6404768 | 13 | 8 | 15 | -122 | PL | (Corr'd Nav, Kongsberg 14208, img#23) (V) (T.A) |
| 05-Apr-2023 | 00:14:05 | 1387 | ECR_ENV_14 | | | camera | 67 | 528150 | 6404775 | 528139 | 6404768 | 11 | 6 | 13 | -119 | PL | (Corr'd Nav, Kongsberg 14208, img#24) (V) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 05-Apr-2023 | 00:14:35 | 1388 | ECR_ENV_14 | | | camera | 67 | 528148 | 6404771 | 528139 | 6404768 | 9 | 3 | 10 | -107 | PL | (Corr'd Nav, Kongsberg 14208, img#25) (V) (T.A) |
| 05-Apr-2023 | 00:15:02 | 1389 | ECR_ENV_14 | | | camera | 67 | 528146 | 6404772 | 528139 | 6404768 | 8 | 4 | 9 | -116 | PL | (Corr'd Nav, Kongsberg 14208, img#26) (V) (T.A) |
| 05-Apr-2023 | 00:15:31 | 1390 | ECR_ENV_14 | | | camera | 67 | 528143 | 6404769 | 528139 | 6404768 | 4 | 0 | 4 | -93 | PL | (Corr'd Nav, Kongsberg 14208, img#27) (V) (T.A) |
| 05-Apr-2023 | 00:16:23 | 1391 | ECR_ENV_14 | | | camera | 67 | 528139 | 6404766 | 528139 | 6404768 | 0 | -3 | 3 | -8 | PL | (Corr'd Nav, Kongsberg 14208, img#28) (V) (T.A) |
| 05-Apr-2023 | 00:16:39 | 1392 | ECR_ENV_14 | | | camera | 67 | 528137 | 6404763 | 528139 | 6404768 | -2 | -5 | 5 | 20 | PL | (Corr'd Nav, Kongsberg 14208, img#29) (V) (T.A) |
| 05-Apr-2023 | 00:16:45 | 1393 | ECR_ENV_14 | | | camera | 66 | 528136 | 6404763 | 528139 | 6404768 | -3 | -5 | 6 | 27 | PL | (Corr'd Nav, Kongsberg 14208, img#30) (V) (T.A) |
| 05-Apr-2023 | 00:17:08 | 1394 | ECR_ENV_14 | | | camera | 67 | 528134 | 6404762 | 528139 | 6404768 | -5 | -6 | 8 | 36 | PL | (Corr'd Nav, Kongsberg 14208, img#31) (V) (T.A) |
| 05-Apr-2023 | 00:17:23 | 1395 | ECR_ENV_14 | | | camera | 66 | 528132 | 6404759 | 528139 | 6404768 | -6 | -9 | 11 | 34 | PL | (Corr'd Nav, Kongsberg 14208, img#32) (V) (T.A) |
| 05-Apr-2023 | 00:18:10 | 1396 | ECR_ENV_14 | | | camera | 67 | 528129 | 6404753 | 528139 | 6404768 | -9 | -15 | 18 | 32 | PL | (Corr'd Nav, Kongsberg 14208, img#33) (V) (T.A) |
| 05-Apr-2023 | 00:18:25 | 1397 | ECR_ENV_14 | | | camera | 67 | 528128 | 6404750 | 528139 | 6404768 | -11 | -18 | 21 | 32 | PL | (Corr'd Nav, Kongsberg 14208, img#34) (V) (T.A) |
| 05-Apr-2023 | 00:18:41 | 1398 | ECR_ENV_14 | | | camera | 67 | 528126 | 6404749 | 528139 | 6404768 | -13 | -19 | 23 | 34 | PL | (Corr'd Nav, Kongsberg 14208, img#35) (V) (T.A) |
| 05-Apr-2023 | 00:19:30 | 1399 | ECR_ENV_14 | | | camera | 67 | 528123 | 6404746 | 528139 | 6404768 | -16 | -22 | 27 | 36 | PL | (Corr'd Nav, Kongsberg 14208, img#36) (V) (T.A) |
| 05-Apr-2023 | 00:19:40 | 1400 | ECR_ENV_14 | | | camera | 67 | 528121 | 6404744 | 528139 | 6404768 | -17 | -24 | 30 | 36 | PL | (Corr'd Nav, Kongsberg 14208, img#37) (V) (T.A) |
| 05-Apr-2023 | 00:20:35 | 1401 | ECR_ENV_14 | | | camera | 67 | 528116 | 6404741 | 528139 | 6404768 | -23 | -27 | 36 | 40 | PL | (Corr'd Nav, Kongsberg 14208, img#38) (V) (T.A) |
| 05-Apr-2023 | 00:20:57 | 1402 | ECR_ENV_14 | | | camera | 67 | 528113 | 6404740 | 528139 | 6404768 | -26 | -28 | 38 | 43 | PL | (Corr'd Nav, Kongsberg 14208, img#39) (V) (T.A) |
| 05-Apr-2023 | 00:21:27 | 1403 | ECR_ENV_14 | | | camera | 67 | 528108 | 6404737 | 528139 | 6404768 | -31 | -31 | 44 | 44 | PL | (Corr'd Nav, Kongsberg 14208, img#40) (V) (T.A) |
| 05-Apr-2023 | 00:21:49 | 1404 | ECR_ENV_14 | | | camera | 67 | 528107 | 6404734 | 528139 | 6404768 | -32 | -34 | 47 | 43 | PL | (Corr'd Nav, Kongsberg 14208, img#41) (V) (T.A) |
| 05-Apr-2023 | 00:22:01 | 1405 | ECR_ENV_14 | | | camera | 67 | 528106 | 6404732 | 528139 | 6404768 | -33 | -37 | 49 | 42 | PL | (Corr'd Nav, Kongsberg 14208, img#42) (V) (T.A) |
| 05-Apr-2023 | 02:49:00 | 1406 | ECR_ENV_35 | | | camera | 77 | 528926 | 6405462 | 528927 | 6405414 | -1 | 49 | 49 | 179 | PL | (Corr'd Nav, Kongsberg 14208, img#1) (V) (T.A) |
| 05-Apr-2023 | 02:50:04 | 1407 | ECR_ENV_35 | | | camera | 77 | 528922 | 6405463 | 528927 | 6405414 | -4 | 49 | 50 | 175 | PL | (Corr'd Nav, Kongsberg 14208, img#2) (V) (T.A) |
| 05-Apr-2023 | 02:50:46 | 1408 | ECR_ENV_35 | | | camera | 77 | 528924 | 6405457 | 528927 | 6405414 | -3 | 44 | 44 | 177 | PL | (Corr'd Nav, Kongsberg 14208, img#3) (V) (T.A) |
| 05-Apr-2023 | 02:50:56 | 1409 | ECR_ENV_35 | | | camera | 77 | 528924 | 6405456 | 528927 | 6405414 | -2 | 42 | 42 | 177 | PL | (Corr'd Nav, Kongsberg 14208, img#4) (V) (T.A) |
| 05-Apr-2023 | 02:51:15 | 1410 | ECR_ENV_35 | | | camera | 77 | 528927 | 6405453 | 528927 | 6405414 | 1 | 39 | 39 | -179 | PL | (Corr'd Nav, Kongsberg 14208, img#5) (V) (T.A) |
| 05-Apr-2023 | 02:51:22 | 1411 | ECR_ENV_35 | | | camera | 77 | 528927 | 6405451 | 528927 | 6405414 | 1 | 38 | 38 | -179 | PL | (Corr'd Nav, Kongsberg 14208, img#6) (V) (T.A) |
| 05-Apr-2023 | 02:51:36 | 1412 | ECR_ENV_35 | | | camera | 77 | 528928 | 6405448 | 528927 | 6405414 | 1 | 34 | 34 | -178 | PL | (Corr'd Nav, Kongsberg 14208, img#7) (V) (T.A) |
| 05-Apr-2023 | 02:51:45 | 1413 | ECR_ENV_35 | | | camera | 77 | 528928 | 6405446 | 528927 | 6405414 | 2 | 32 | 32 | -177 | PL | (Corr'd Nav, Kongsberg 14208, img#8) (V) (T.A) |
| 05-Apr-2023 | 02:51:59 | 1414 | ECR_ENV_35 | | | camera | 77 | 528929 | 6405444 | 528927 | 6405414 | 3 | 30 | 30 | -175 | PL | (Corr'd Nav, Kongsberg 14208, img#9) (V) (T.A) |
| 05-Apr-2023 | 02:52:14 | 1415 | ECR_ENV_35 | | | camera | 77 | 528933 | 6405442 | 528927 | 6405414 | 7 | 28 | 29 | -167 | PL | (Corr'd Nav, Kongsberg 14208, img#10) (V) (T.A) |
| 05-Apr-2023 | 02:53:12 | 1416 | ECR_ENV_35 | | | camera | 77 | 528929 | 6405439 | 528927 | 6405414 | 2 | 25 | 25 | -175 | PL | (Corr'd Nav, Kongsberg 14208, img#11) (V) (T.A) |
| 05-Apr-2023 | 02:53:20 | 1417 | ECR_ENV_35 | | | camera | 77 | 528928 | 6405437 | 528927 | 6405414 | 1 | 23 | 23 | -177 | PL | (Corr'd Nav, Kongsberg 14208, img#12) (V) (T.A) |
| 05-Apr-2023 | 02:54:44 | 1418 | ECR_ENV_35 | | | camera | 77 | 528929 | 6405423 | 528927 | 6405414 | 3 | 10 | 10 | -165 | PL | (Corr'd Nav, Kongsberg 14208, img#13) (V) (T.A) |
| 05-Apr-2023 | 02:55:27 | 1419 | ECR_ENV_35 | | | camera | 77 | 528926 | 6405422 | 528927 | 6405414 | -1 | 9 | 9 | 175 | PL | (Corr'd Nav, Kongsberg 14208, img#14) (V) (T.A) |
| 05-Apr-2023 | 02:55:55 | 1420 | ECR_ENV_35 | | | camera | 76 | 528927 | 6405417 | 528927 | 6405414 | 1 | 3 | 3 | -168 | PL | (Corr'd Nav, Kongsberg 14208, img#15) (V) (T.A) |
| 05-Apr-2023 | 02:56:15 | 1421 | ECR_ENV_35 | | | camera | 76 | 528926 | 6405413 | 528927 | 6405414 | -1 | -1 | 1 | 42 | PL | (Corr'd Nav, Kongsberg 14208, img#16) (V) (T.A) |
| 05-Apr-2023 | 02:56:21 | 1422 | ECR_ENV_35 | | | camera | 76 | 528926 | 6405411 | 528927 | 6405414 | 0 | -2 | 2 | 5 | PL | (Corr'd Nav, Kongsberg 14208, img#17) (V) (T.A) |
| 05-Apr-2023 | 02:56:28 | 1423 | ECR_ENV_35 | | | camera | 76 | 528927 | 6405410 | 528927 | 6405414 | 1 | -4 | 4 | -12 | PL | (Corr'd Nav, Kongsberg 14208, img#18) (V) (T.A) |
| 05-Apr-2023 | 02:56:34 | 1424 | ECR_ENV_35 | | | camera | 76 | 528928 | 6405409 | 528927 | 6405414 | 2 | -5 | 5 | -18 | PL | (Corr'd Nav, Kongsberg 14208, img#19) (V) (T.A) |
| 05-Apr-2023 | 02:57:17 | 1425 | ECR_ENV_35 | | | camera | 76 | 528924 | 6405404 | 528927 | 6405414 | -3 | -9 | 10 | 17 | PL | (Corr'd Nav, Kongsberg 14208, img#20) (V) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Seafloor Sampling Positioning Summary

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | | x | 6.7 | y | 21.94 | z | 2.93 | |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | | | | Vertical / Tidal Datum | VORF, LAT | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 05-Apr-2023 | 02:57:52 | 1426 | ECR_ENV_35 | | | camera | 76 | 528926 | 6405398 | 528927 | 6405414 | -1 | -15 | 15 | 2 | PL | (Corr'd Nav, Kongsberg 14208, img#21) (V) (T.A) |
| 05-Apr-2023 | 02:58:13 | 1427 | ECR_ENV_35 | | | camera | 76 | 528926 | 6405393 | 528927 | 6405414 | -1 | -20 | 20 | 3 | PL | (Corr'd Nav, Kongsberg 14208, img#22) (V) (T.A) |
| 05-Apr-2023 | 02:58:39 | 1428 | ECR_ENV_35 | | | camera | 76 | 528926 | 6405390 | 528927 | 6405414 | -1 | -23 | 23 | 2 | PL | (Corr'd Nav, Kongsberg 14208, img#23) (V) (T.A) |
| 05-Apr-2023 | 02:59:14 | 1429 | ECR_ENV_35 | | | camera | 76 | 528926 | 6405383 | 528927 | 6405414 | -1 | -31 | 31 | 2 | PL | (Corr'd Nav, Kongsberg 14208, img#24) (V) (T.A) |
| 05-Apr-2023 | 02:59:22 | 1430 | ECR_ENV_35 | | | camera | 76 | 528926 | 6405381 | 528927 | 6405414 | -1 | -33 | 33 | 1 | PL | (Corr'd Nav, Kongsberg 14208, img#25) (V) (T.A) |
| 05-Apr-2023 | 02:59:45 | 1431 | ECR_ENV_35 | | | camera | 76 | 528926 | 6405377 | 528927 | 6405414 | -1 | -37 | 37 | 1 | PL | (Corr'd Nav, Kongsberg 14208, img#26) (V) (T.A) |
| 05-Apr-2023 | 02:59:50 | 1432 | ECR_ENV_35 | | | camera | 76 | 528926 | 6405376 | 528927 | 6405414 | 0 | -38 | 38 | 1 | PL | (Corr'd Nav, Kongsberg 14208, img#27) (V) (T.A) |
| 05-Apr-2023 | 02:59:57 | 1433 | ECR_ENV_35 | | | camera | 76 | 528926 | 6405375 | 528927 | 6405414 | 0 | -39 | 39 | 0 | PL | (Corr'd Nav, Kongsberg 14208, img#28) (V) (T.A) |
| 05-Apr-2023 | 03:00:05 | 1434 | ECR_ENV_35 | | | camera | 76 | 528927 | 6405373 | 528927 | 6405414 | 0 | -41 | 41 | 0 | PL | (Corr'd Nav, Kongsberg 14208, img#29) (V) (T.A) |
| 05-Apr-2023 | 03:00:09 | 1435 | ECR_ENV_35 | | | camera | 76 | 528926 | 6405372 | 528927 | 6405414 | 0 | -42 | 42 | 0 | PL | (Corr'd Nav, Kongsberg 14208, img#30) (V) (T.A) |
| 05-Apr-2023 | 03:00:15 | 1436 | ECR_ENV_35 | | | camera | 76 | 528926 | 6405371 | 528927 | 6405414 | -1 | -43 | 43 | 1 | PL | (Corr'd Nav, Kongsberg 14208, img#31) (V) (T.A) |
| 05-Apr-2023 | 03:00:20 | 1437 | ECR_ENV_35 | | | camera | 76 | 528925 | 6405370 | 528927 | 6405414 | -1 | -44 | 44 | 2 | PL | (Corr'd Nav, Kongsberg 14208, img#32) (V) (T.A) |
| 05-Apr-2023 | 03:00:26 | 1438 | ECR_ENV_35 | | | camera | 76 | 528925 | 6405369 | 528927 | 6405414 | -2 | -45 | 45 | 2 | PL | (Corr'd Nav, Kongsberg 14208, img#33) (V) (T.A) |
| 05-Apr-2023 | 03:00:32 | 1439 | ECR_ENV_35 | | | camera | 76 | 528925 | 6405368 | 528927 | 6405414 | -1 | -46 | 46 | 2 | PL | (Corr'd Nav, Kongsberg 14208, img#34) (V) (T.A) |
| 05-Apr-2023 | 03:00:39 | 1440 | ECR_ENV_35 | | | camera | 76 | 528926 | 6405367 | 528927 | 6405414 | -1 | -47 | 47 | 1 | PL | (Corr'd Nav, Kongsberg 14208, img#35) (V) (T.A) |
| 05-Apr-2023 | 03:00:45 | 1441 | ECR_ENV_35 | | | camera | 76 | 528926 | 6405366 | 528927 | 6405414 | -1 | -48 | 48 | 1 | PL | (Corr'd Nav, Kongsberg 14208, img#36) (V) (T.A) |
| 05-Apr-2023 | 03:00:56 | 1442 | ECR_ENV_35 | | | camera | 76 | 528926 | 6405365 | 528927 | 6405414 | 0 | -49 | 49 | 0 | PL | (Corr'd Nav, Kongsberg 14208, img#37) (V) (T.A) |
| 05-Apr-2023 | 05:01:42 | 1443 | ECR_ENV_12 | | | camera | 90 | 527239 | 6406254 | 527238 | 6406199 | 0 | 56 | 56 | -180 | PL | (Corr'd Nav, Kongsberg 14208, img#1) (V) (T.A) |
| 05-Apr-2023 | 05:02:47 | 1444 | ECR_ENV_12 | | | camera | 90 | 527231 | 6406254 | 527238 | 6406199 | -7 | 55 | 56 | 173 | PL | (Corr'd Nav, Kongsberg 14208, img#2) (V) (T.A) |
| 05-Apr-2023 | 05:03:17 | 1445 | ECR_ENV_12 | | | camera | 90 | 527233 | 6406254 | 527238 | 6406199 | -5 | 55 | 55 | 175 | PL | (Corr'd Nav, Kongsberg 14208, img#3) (V) (T.A) |
| 05-Apr-2023 | 05:03:35 | 1446 | ECR_ENV_12 | | | camera | 90 | 527231 | 6406251 | 527238 | 6406199 | -8 | 53 | 53 | 172 | PL | (Corr'd Nav, Kongsberg 14208, img#4) (V) (T.A) |
| 05-Apr-2023 | 05:04:01 | 1447 | ECR_ENV_12 | | | camera | 90 | 527230 | 6406247 | 527238 | 6406199 | -8 | 49 | 50 | 170 | PL | (Corr'd Nav, Kongsberg 14208, img#5) (V) (T.A) |
| 05-Apr-2023 | 05:04:35 | 1448 | ECR_ENV_12 | | | camera | 90 | 527231 | 6406243 | 527238 | 6406199 | -7 | 44 | 45 | 171 | PL | (Corr'd Nav, Kongsberg 14208, img#6) (V) (T.A) |
| 05-Apr-2023 | 05:05:05 | 1449 | ECR_ENV_12 | | | camera | 90 | 527232 | 6406239 | 527238 | 6406199 | -6 | 40 | 41 | 171 | PL | (Corr'd Nav, Kongsberg 14208, img#7) (V) (T.A) |
| 05-Apr-2023 | 05:05:19 | 1450 | ECR_ENV_12 | | | camera | 90 | 527233 | 6406237 | 527238 | 6406199 | -5 | 38 | 39 | 173 | PL | (Corr'd Nav, Kongsberg 14208, img#8) (V) (T.A) |
| 05-Apr-2023 | 05:05:32 | 1451 | ECR_ENV_12 | | | camera | 90 | 527234 | 6406236 | 527238 | 6406199 | -5 | 37 | 37 | 173 | PL | (Corr'd Nav, Kongsberg 14208, img#9) (V) (T.A) |
| 05-Apr-2023 | 05:05:54 | 1452 | ECR_ENV_12 | | | camera | 89 | 527234 | 6406233 | 527238 | 6406199 | -5 | 34 | 35 | 172 | PL | (Corr'd Nav, Kongsberg 14208, img#10) (V) (T.A) |
| 05-Apr-2023 | 05:06:17 | 1453 | ECR_ENV_12 | | | camera | 89 | 527234 | 6406230 | 527238 | 6406199 | -4 | 31 | 31 | 172 | PL | (Corr'd Nav, Kongsberg 14208, img#11) (V) (T.A) |
| 05-Apr-2023 | 05:06:44 | 1454 | ECR_ENV_12 | | | camera | 90 | 527234 | 6406226 | 527238 | 6406199 | -4 | 27 | 28 | 171 | PL | (Corr'd Nav, Kongsberg 14208, img#12) (V) (T.A) |
| 05-Apr-2023 | 05:07:00 | 1455 | ECR_ENV_12 | | | camera | 89 | 527233 | 6406224 | 527238 | 6406199 | -5 | 25 | 26 | 169 | PL | (Corr'd Nav, Kongsberg 14208, img#13) (V) (T.A) |
| 05-Apr-2023 | 05:07:25 | 1456 | ECR_ENV_12 | | | camera | 89 | 527232 | 6406220 | 527238 | 6406199 | -6 | 21 | 22 | 165 | PL | (Corr'd Nav, Kongsberg 14208, img#14) (V) (T.A) |
| 05-Apr-2023 | 05:07:39 | 1457 | ECR_ENV_12 | | | camera | 89 | 527231 | 6406219 | 527238 | 6406199 | -7 | 20 | 21 | 161 | PL | (Corr'd Nav, Kongsberg 14208, img#15) (V) (T.A) |
| 05-Apr-2023 | 05:07:53 | 1458 | ECR_ENV_12 | | | camera | 89 | 527231 | 6406217 | 527238 | 6406199 | -8 | 19 | 20 | 158 | PL | (Corr'd Nav, Kongsberg 14208, img#16) (V) (T.A) |
| 05-Apr-2023 | 05:08:00 | 1459 | ECR_ENV_12 | | | camera | 89 | 527231 | 6406216 | 527238 | 6406199 | -8 | 18 | 19 | 157 | PL | (Corr'd Nav, Kongsberg 14208, img#17) (V) (T.A) |
| 05-Apr-2023 | 05:08:43 | 1460 | ECR_ENV_12 | | | camera | 89 | 527232 | 6406210 | 527238 | 6406199 | -6 | 12 | 13 | 154 | PL | (Corr'd Nav, Kongsberg 14208, img#18) (V) (T.A) |
| 05-Apr-2023 | 05:08:50 | 1461 | ECR_ENV_12 | | | camera | 89 | 527232 | 6406210 | 527238 | 6406199 | -6 | 11 | 13 | 151 | PL | (Corr'd Nav, Kongsberg 14208, img#19) (V) (T.A) |
| 05-Apr-2023 | 05:09:15 | 1462 | ECR_ENV_12 | | | camera | 89 | 527233 | 6406207 | 527238 | 6406199 | -5 | 9 | 10 | 148 | PL | (Corr'd Nav, Kongsberg 14208, img#20) (V) (T.A) |
| 05-Apr-2023 | 05:09:27 | 1463 | ECR_ENV_12 | | | camera | 89 | 527234 | 6406205 | 527238 | 6406199 | -4 | 7 | 8 | 148 | PL | (Corr'd Nav, Kongsberg 14208, img#21) (V) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 05-Apr-2023 | 05:09:46 | 1464 | ECR_ENV_12 | | | camera | 89 | 527235 | 6406203 | 527238 | 6406199 | -3 | 5 | 5 | 147 | PL | (Corr'd Nav, Kongsberg 14208, img#22) (V) (T.A) |
| 05-Apr-2023 | 05:10:21 | 1465 | ECR_ENV_12 | | | camera | 89 | 527237 | 6406201 | 527238 | 6406199 | -2 | 3 | 3 | 150 | PL | (Corr'd Nav, Kongsberg 14208, img#23) (V) (T.A) |
| 05-Apr-2023 | 05:10:42 | 1466 | ECR_ENV_12 | | | camera | 89 | 527237 | 6406198 | 527238 | 6406199 | -1 | -1 | 1 | 68 | PL | (Corr'd Nav, Kongsberg 14208, img#24) (V) (T.A) |
| 05-Apr-2023 | 05:11:17 | 1467 | ECR_ENV_12 | | | camera | 89 | 527238 | 6406193 | 527238 | 6406199 | 0 | -5 | 5 | 3 | PL | (Corr'd Nav, Kongsberg 14208, img#25) (V) (T.A) |
| 05-Apr-2023 | 05:11:36 | 1468 | ECR_ENV_12 | | | camera | 89 | 527237 | 6406191 | 527238 | 6406199 | -2 | -8 | 8 | 12 | PL | (Corr'd Nav, Kongsberg 14208, img#26) (V) (T.A) |
| 05-Apr-2023 | 05:11:58 | 1469 | ECR_ENV_12 | | | camera | 89 | 527237 | 6406188 | 527238 | 6406199 | -1 | -11 | 11 | 4 | PL | (Corr'd Nav, Kongsberg 14208, img#27) (V) (T.A) |
| 05-Apr-2023 | 05:12:23 | 1470 | ECR_ENV_12 | | | camera | 89 | 527237 | 6406186 | 527238 | 6406199 | -1 | -13 | 13 | 4 | PL | (Corr'd Nav, Kongsberg 14208, img#28) (V) (T.A) |
| 05-Apr-2023 | 05:12:48 | 1471 | ECR_ENV_12 | | | camera | 89 | 527239 | 6406183 | 527238 | 6406199 | 1 | -15 | 15 | -4 | PL | (Corr'd Nav, Kongsberg 14208, img#29) (V) (T.A) |
| 05-Apr-2023 | 05:13:29 | 1472 | ECR_ENV_12 | | | camera | 89 | 527239 | 6406179 | 527238 | 6406199 | 1 | -20 | 20 | -3 | PL | (Corr'd Nav, Kongsberg 14208, img#30) (V) (T.A) |
| 05-Apr-2023 | 05:13:43 | 1473 | ECR_ENV_12 | | | camera | 89 | 527239 | 6406178 | 527238 | 6406199 | 1 | -21 | 21 | -2 | PL | (Corr'd Nav, Kongsberg 14208, img#31) (V) (T.A) |
| 05-Apr-2023 | 05:14:03 | 1474 | ECR_ENV_12 | | | camera | 89 | 527238 | 6406174 | 527238 | 6406199 | 0 | -24 | 24 | 0 | PL | (Corr'd Nav, Kongsberg 14208, img#32) (V) (T.A) |
| 05-Apr-2023 | 05:14:17 | 1475 | ECR_ENV_12 | | | camera | 89 | 527238 | 6406172 | 527238 | 6406199 | 0 | -26 | 26 | 1 | PL | (Corr'd Nav, Kongsberg 14208, img#33) (V) (T.A) |
| 05-Apr-2023 | 05:14:38 | 1476 | ECR_ENV_12 | | | camera | 89 | 527237 | 6406171 | 527238 | 6406199 | -1 | -28 | 28 | 3 | PL | (Corr'd Nav, Kongsberg 14208, img#34) (V) (T.A) |
| 05-Apr-2023 | 05:14:58 | 1477 | ECR_ENV_12 | | | camera | 89 | 527236 | 6406168 | 527238 | 6406199 | -2 | -31 | 31 | 4 | PL | (Corr'd Nav, Kongsberg 14208, img#35) (V) (T.A) |
| 05-Apr-2023 | 05:15:26 | 1478 | ECR_ENV_12 | | | camera | 89 | 527235 | 6406164 | 527238 | 6406199 | -3 | -35 | 35 | 5 | PL | (Corr'd Nav, Kongsberg 14208, img#36) (V) (T.A) |
| 05-Apr-2023 | 05:15:49 | 1479 | ECR_ENV_12 | | | camera | 89 | 527236 | 6406160 | 527238 | 6406199 | -2 | -39 | 39 | 3 | PL | (Corr'd Nav, Kongsberg 14208, img#37) (V) (T.A) |
| 05-Apr-2023 | 05:15:57 | 1480 | ECR_ENV_12 | | | camera | 89 | 527236 | 6406159 | 527238 | 6406199 | -2 | -39 | 39 | 3 | PL | (Corr'd Nav, Kongsberg 14208, img#38) (V) (T.A) |
| 05-Apr-2023 | 05:16:33 | 1481 | ECR_ENV_12 | | | camera | 89 | 527239 | 6406156 | 527238 | 6406199 | 0 | -43 | 43 | -1 | PL | (Corr'd Nav, Kongsberg 14208, img#39) (V) (T.A) |
| 05-Apr-2023 | 05:16:53 | 1482 | ECR_ENV_12 | | | camera | 89 | 527239 | 6406154 | 527238 | 6406199 | 1 | -45 | 45 | -1 | PL | (Corr'd Nav, Kongsberg 14208, img#40) (V) (T.A) |
| 05-Apr-2023 | 13:32:43 | 1483 | ECR_ENV_24 | | | camera | 91 | 526068 | 6407712 | 526032 | 6407680 | 37 | 32 | 49 | -131 | SG | (Raw Nav, Kongsberg 14208, img#1) (V) |
| 05-Apr-2023 | 13:32:54 | 1484 | ECR_ENV_24 | | | camera | 91 | 526067 | 6407712 | 526032 | 6407680 | 36 | 32 | 48 | -132 | SG | (Raw Nav, Kongsberg 14208, img#2) (V) |
| 05-Apr-2023 | 13:36:09 | 1485 | ECR_ENV_24 | | | camera | 91 | 526062 | 6407710 | 526032 | 6407680 | 31 | 30 | 43 | -135 | SG | (Raw Nav, Kongsberg 14208, img#3) (V) |
| 05-Apr-2023 | | 1486 | ECR_ENV_24 | | | camera | | | | | | | | | | SG | Lost connection with EELS, Photo but no Fix taken |
| 05-Apr-2023 | | 1487 | ECR_ENV_24 | | | camera | | | | | | | | | | SG | Lost connection with EELS, Photo but no Fix taken |
| 05-Apr-2023 | | 1488 | ECR_ENV_24 | | | camera | | | | | | | | | | SG | Lost connection with EELS, Photo but no Fix taken |
| 05-Apr-2023 | 13:37:31 | 1489 | ECR_ENV_24 | | | camera | 93 | 526058 | 6407701 | 526032 | 6407680 | 27 | 21 | 34 | -128 | SG | (Corr'd Nav, Kongsberg 14208, img#7) (V) |
| 05-Apr-2023 | 13:37:39 | 1490 | ECR_ENV_24 | | | camera | 93 | 526058 | 6407700 | 526032 | 6407680 | 27 | 20 | 33 | -127 | SG | (Corr'd Nav, Kongsberg 14208, img#8) (V) |
| 05-Apr-2023 | 13:37:57 | 1491 | ECR_ENV_24 | | | camera | 93 | 526056 | 6407697 | 526032 | 6407680 | 25 | 17 | 30 | -124 | SG | (Corr'd Nav, Kongsberg 14208, img#9) (V) |
| 05-Apr-2023 | 13:38:12 | 1492 | ECR_ENV_24 | | | camera | 93 | 526053 | 6407694 | 526032 | 6407680 | 22 | 14 | 26 | -123 | SG | (Corr'd Nav, Kongsberg 14208, img#10) (V) |
| 05-Apr-2023 | 13:38:32 | 1493 | ECR_ENV_24 | | | camera | 93 | 526051 | 6407694 | 526032 | 6407680 | 20 | 14 | 24 | -125 | SG | (Corr'd Nav, Kongsberg 14208, img#11) (V) |
| 05-Apr-2023 | 13:38:47 | 1494 | ECR_ENV_24 | | | camera | 93 | 526049 | 6407691 | 526032 | 6407680 | 17 | 11 | 20 | -123 | SG | (Corr'd Nav, Kongsberg 14208, img#12) (V) |
| 05-Apr-2023 | 13:39:03 | 1495 | ECR_ENV_24 | | | camera | 93 | 526046 | 6407688 | 526032 | 6407680 | 14 | 8 | 17 | -120 | SG | (Corr'd Nav, Kongsberg 14208, img#13) (V) |
| 05-Apr-2023 | 13:39:21 | 1496 | ECR_ENV_24 | | | camera | 92 | 526044 | 6407688 | 526032 | 6407680 | 12 | 8 | 15 | -124 | SG | (Corr'd Nav, Kongsberg 14208, img#14) (V) |
| 05-Apr-2023 | 13:39:38 | 1497 | ECR_ENV_24 | | | camera | 93 | 526042 | 6407688 | 526032 | 6407680 | 10 | 8 | 13 | -127 | SG | (Corr'd Nav, Kongsberg 14208, img#15) (V) |
| 05-Apr-2023 | 13:40:02 | 1498 | ECR_ENV_24 | | | camera | 93 | 526040 | 6407683 | 526032 | 6407680 | 9 | 3 | 9 | -111 | SG | (Corr'd Nav, Kongsberg 14208, img#16) (V) |
| 05-Apr-2023 | 13:40:15 | 1499 | ECR_ENV_24 | | | camera | 93 | 526038 | 6407682 | 526032 | 6407680 | 7 | 3 | 7 | -110 | SG | (Corr'd Nav, Kongsberg 14208, img#17) (V) |
| 05-Apr-2023 | 13:40:33 | 1500 | ECR_ENV_24 | | | camera | 93 | 526036 | 6407684 | 526032 | 6407680 | 4 | 4 | 6 | -131 | SG | (Corr'd Nav, Kongsberg 14208, img#18) (V) |
| 05-Apr-2023 | 13:40:50 | 1501 | ECR_ENV_24 | | | camera | 93 | 526034 | 6407683 | 526032 | 6407680 | 3 | 3 | 4 | -140 | SG | (Corr'd Nav, Kongsberg 14208, img#19) (V) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 05-Apr-2023 | 13:41:05 | 1502 | ECR_ENV_24 | | | camera | 92 | 526033 | 6407681 | 526032 | 6407680 | 2 | 1 | 2 | -124 | SG | (Corr'd Nav, Kongsberg 14208, img#20) (V) |
| 05-Apr-2023 | 13:41:17 | 1503 | ECR_ENV_24 | | | camera | 93 | 526032 | 6407680 | 526032 | 6407680 | 0 | 0 | 1 | -128 | SG | (Corr'd Nav, Kongsberg 14208, img#21) (V) |
| 05-Apr-2023 | 13:41:41 | 1504 | ECR_ENV_24 | | | camera | 93 | 526031 | 6407677 | 526032 | 6407680 | -1 | -3 | 3 | 13 | SG | (Corr'd Nav, Kongsberg 14208, img#22) (V) |
| 05-Apr-2023 | 13:42:03 | 1505 | ECR_ENV_24 | | | camera | 92 | 526029 | 6407674 | 526032 | 6407680 | -3 | -6 | 6 | 27 | SG | (Corr'd Nav, Kongsberg 14208, img#23) (V) |
| 05-Apr-2023 | 13:42:20 | 1506 | ECR_ENV_24 | | | camera | 92 | 526028 | 6407673 | 526032 | 6407680 | -4 | -7 | 8 | 28 | SG | (Corr'd Nav, Kongsberg 14208, img#24) (V) |
| 05-Apr-2023 | 13:42:32 | 1507 | ECR_ENV_24 | | | camera | 93 | 526028 | 6407670 | 526032 | 6407680 | -4 | -10 | 10 | 22 | SG | (Corr'd Nav, Kongsberg 14208, img#25) (V) |
| 05-Apr-2023 | 13:42:50 | 1508 | ECR_ENV_24 | | | camera | 93 | 526025 | 6407666 | 526032 | 6407680 | -6 | -14 | 15 | 24 | SG | (Corr'd Nav, Kongsberg 14208, img#26) (V) |
| 05-Apr-2023 | 13:42:59 | 1509 | ECR_ENV_24 | | | camera | 93 | 526024 | 6407664 | 526032 | 6407680 | -8 | -16 | 17 | 26 | SG | (Corr'd Nav, Kongsberg 14208, img#27) (V) |
| 05-Apr-2023 | 13:43:08 | 1510 | ECR_ENV_24 | | | camera | 93 | 526023 | 6407663 | 526032 | 6407680 | -9 | -17 | 19 | 27 | SG | (Corr'd Nav, Kongsberg 14208, img#28) (V) |
| 05-Apr-2023 | 13:43:17 | 1511 | ECR_ENV_24 | | | camera | 93 | 526021 | 6407661 | 526032 | 6407680 | -10 | -19 | 22 | 28 | SG | (Corr'd Nav, Kongsberg 14208, img#29) (V) |
| 05-Apr-2023 | 13:43:26 | 1512 | ECR_ENV_24 | | | camera | 93 | 526020 | 6407660 | 526032 | 6407680 | -11 | -20 | 23 | 29 | SG | (Corr'd Nav, Kongsberg 14208, img#30) (V) |
| 05-Apr-2023 | 13:43:37 | 1513 | ECR_ENV_24 | | | camera | 93 | 526019 | 6407658 | 526032 | 6407680 | -13 | -22 | 25 | 30 | SG | (Corr'd Nav, Kongsberg 14208, img#31) (V) |
| 05-Apr-2023 | 13:44:02 | 1514 | ECR_ENV_24 | | | camera | 92 | 526016 | 6407659 | 526032 | 6407680 | -15 | -21 | 26 | 36 | SG | (Corr'd Nav, Kongsberg 14208, img#32) (V) |
| 05-Apr-2023 | 13:44:09 | 1515 | ECR_ENV_24 | | | camera | 93 | 526015 | 6407659 | 526032 | 6407680 | -16 | -21 | 26 | 37 | SG | (Corr'd Nav, Kongsberg 14208, img#33) (V) |
| 05-Apr-2023 | 13:44:18 | 1516 | ECR_ENV_24 | | | camera | 92 | 526014 | 6407659 | 526032 | 6407680 | -17 | -21 | 27 | 39 | SG | (Corr'd Nav, Kongsberg 14208, img#34) (V) |
| 05-Apr-2023 | 13:44:32 | 1517 | ECR_ENV_24 | | | camera | 92 | 526012 | 6407659 | 526032 | 6407680 | -19 | -21 | 28 | 42 | SG | (Corr'd Nav, Kongsberg 14208, img#35) (V) |
| 05-Apr-2023 | 13:44:45 | 1518 | ECR_ENV_24 | | | camera | 92 | 526010 | 6407659 | 526032 | 6407680 | -21 | -21 | 30 | 46 | SG | (Corr'd Nav, Kongsberg 14208, img#36) (V) |
| 05-Apr-2023 | 13:45:00 | 1519 | ECR_ENV_24 | | | camera | 92 | 526008 | 6407658 | 526032 | 6407680 | -23 | -22 | 32 | 47 | SG | (Corr'd Nav, Kongsberg 14208, img#37) (V) |
| 05-Apr-2023 | 13:45:19 | 1520 | ECR_ENV_24 | | | camera | 92 | 526009 | 6407655 | 526032 | 6407680 | -23 | -26 | 34 | 42 | SG | (Corr'd Nav, Kongsberg 14208, img#38) (V) |
| 05-Apr-2023 | 13:45:29 | 1521 | ECR_ENV_24 | | | camera | 92 | 526008 | 6407652 | 526032 | 6407680 | -23 | -28 | 36 | 40 | SG | (Corr'd Nav, Kongsberg 14208, img#39) (V) |
| 05-Apr-2023 | 13:45:37 | 1522 | ECR_ENV_24 | | | camera | 93 | 526008 | 6407651 | 526032 | 6407680 | -24 | -29 | 38 | 39 | SG | (Corr'd Nav, Kongsberg 14208, img#40) (V) |
| 05-Apr-2023 | 13:45:55 | 1523 | ECR_ENV_24 | | | camera | 91 | 526007 | 6407648 | 526032 | 6407680 | -25 | -32 | 41 | 37 | SG | (Corr'd Nav, Kongsberg 14208, img#41) (V) |
| 05-Apr-2023 | 13:46:11 | 1524 | ECR_ENV_24 | | | camera | 91 | 526005 | 6407645 | 526032 | 6407680 | -26 | -35 | 44 | 37 | SG | (Corr'd Nav, Kongsberg 14208, img#42) (V) |
| 05-Apr-2023 | 13:46:28 | 1525 | ECR_ENV_24 | | | camera | 93 | 526003 | 6407643 | 526032 | 6407680 | -29 | -37 | 47 | 38 | SG | (Corr'd Nav, Kongsberg 14208, img#43) (V) |
| 05-Apr-2023 | 16:06:44 | 1526 | ECR_ENV_09 | | | camera | 87 | 524421 | 6407923 | 524422 | 6407875 | -1 | 48 | 48 | 178 | SG | (Corr'd Nav, Kongsberg 14208, img#1) (V) (T.A) |
| 05-Apr-2023 | 16:06:58 | 1527 | ECR_ENV_09 | | | camera | 87 | 524422 | 6407926 | 524422 | 6407875 | 0 | 52 | 52 | 180 | SG | (Corr'd Nav, Kongsberg 14208, img#2) (V) (T.A) |
| 05-Apr-2023 | 16:07:18 | 1528 | ECR_ENV_09 | | | camera | 87 | 524424 | 6407926 | 524422 | 6407875 | 2 | 51 | 51 | -178 | SG | (Corr'd Nav, Kongsberg 14208, img#3) (V) (T.A) |
| 05-Apr-2023 | 16:07:48 | 1529 | ECR_ENV_09 | | | camera | 87 | 524425 | 6407922 | 524422 | 6407875 | 3 | 47 | 47 | -176 | SG | (Corr'd Nav, Kongsberg 14208, img#4) (V) (T.A) |
| 05-Apr-2023 | 16:08:06 | 1530 | ECR_ENV_09 | | | camera | 87 | 524424 | 6407919 | 524422 | 6407875 | 2 | 44 | 44 | -178 | SG | (Corr'd Nav, Kongsberg 14208, img#5) (V) (T.A) |
| 05-Apr-2023 | 16:08:28 | 1531 | ECR_ENV_09 | | | camera | 87 | 524423 | 6407915 | 524422 | 6407875 | 1 | 41 | 41 | -179 | SG | (Corr'd Nav, Kongsberg 14208, img#6) (V) (T.A) |
| 05-Apr-2023 | 16:08:48 | 1532 | ECR_ENV_09 | | | camera | 87 | 524424 | 6407912 | 524422 | 6407875 | 2 | 38 | 37 | -177 | SG | (Corr'd Nav, Kongsberg 14208, img#7) (V) (T.A) |
| 05-Apr-2023 | 16:09:08 | 1533 | ECR_ENV_09 | | | camera | 87 | 524423 | 6407911 | 524422 | 6407875 | 1 | 36 | 36 | -179 | SG | (Corr'd Nav, Kongsberg 14208, img#8) (V) (T.A) |
| 05-Apr-2023 | 16:09:30 | 1534 | ECR_ENV_09 | | | camera | 87 | 524420 | 6407906 | 524422 | 6407875 | -2 | 31 | 31 | 176 | SG | (Corr'd Nav, Kongsberg 14208, img#9) (V) (T.A) |
| 05-Apr-2023 | 16:09:46 | 1535 | ECR_ENV_09 | | | camera | 87 | 524419 | 6407903 | 524422 | 6407875 | -3 | 28 | 28 | 174 | SG | (Corr'd Nav, Kongsberg 14208, img#10) (V) (T.A) |
| 05-Apr-2023 | 16:09:53 | 1536 | ECR_ENV_09 | | | camera | 87 | 524419 | 6407902 | 524422 | 6407875 | -3 | 27 | 27 | 174 | SG | (Corr'd Nav, Kongsberg 14208, img#11) (V) (T.A) |
| 05-Apr-2023 | 16:10:02 | 1537 | ECR_ENV_09 | | | camera | 87 | 524420 | 6407901 | 524422 | 6407875 | -3 | 26 | 26 | 174 | SG | (Corr'd Nav, Kongsberg 14208, img#12) (V) (T.A) |
| 05-Apr-2023 | 16:10:12 | 1538 | ECR_ENV_09 | | | camera | 87 | 524420 | 6407898 | 524422 | 6407875 | -2 | 23 | 23 | 176 | SG | (Corr'd Nav, Kongsberg 14208, img#13) (V) (T.A) |
| 05-Apr-2023 | 16:10:27 | 1539 | ECR_ENV_09 | | | camera | 87 | 524421 | 6407893 | 524422 | 6407875 | -1 | 18 | 18 | 178 | SG | (Corr'd Nav, Kongsberg 14208, img#14) (V) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | | Vertical / Tidal Datum | VORF, LAT | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 05-Apr-2023 | 16:10:37 | 1540 | ECR_ENV_09 | | | camera | 87 | 524422 | 6407891 | 524422 | 6407875 | 0 | 16 | 16 | -179 | SG | (Corr'd Nav, Kongsberg 14208, img#15) (V) (T.A) |
| 05-Apr-2023 | 16:11:01 | 1541 | ECR_ENV_09 | | | camera | 87 | 524423 | 6407888 | 524422 | 6407875 | 0 | 13 | 13 | -178 | SG | (Corr'd Nav, Kongsberg 14208, img#16) (V) (T.A) |
| 05-Apr-2023 | 16:11:12 | 1542 | ECR_ENV_09 | | | camera | 87 | 524422 | 6407884 | 524422 | 6407875 | 0 | 10 | 10 | -179 | SG | (Corr'd Nav, Kongsberg 14208, img#17) (V) (T.A) |
| 05-Apr-2023 | 16:11:23 | 1543 | ECR_ENV_09 | | | camera | 86 | 524422 | 6407881 | 524422 | 6407875 | 0 | 6 | 6 | 179 | SG | (Corr'd Nav, Kongsberg 14208, img#18) (V) (T.A) |
| 05-Apr-2023 | 16:11:38 | 1544 | ECR_ENV_09 | | | camera | 86 | 524422 | 6407875 | 524422 | 6407875 | 0 | 1 | 1 | 180 | SG | (Corr'd Nav, Kongsberg 14208, img#19) (V) (T.A) |
| 05-Apr-2023 | 16:11:46 | 1545 | ECR_ENV_09 | | | camera | 86 | 524422 | 6407874 | 524422 | 6407875 | 0 | -1 | 1 | -3 | SG | (Corr'd Nav, Kongsberg 14208, img#20) (V) (T.A) |
| 05-Apr-2023 | 16:11:56 | 1546 | ECR_ENV_09 | | | camera | 86 | 524422 | 6407873 | 524422 | 6407875 | 0 | -2 | 2 | 8 | SG | (Corr'd Nav, Kongsberg 14208, img#21) (V) (T.A) |
| 05-Apr-2023 | 16:12:06 | 1547 | ECR_ENV_09 | | | camera | 87 | 524422 | 6407872 | 524422 | 6407875 | 0 | -3 | 3 | 9 | SG | (Corr'd Nav, Kongsberg 14208, img#22) (V) (T.A) |
| 05-Apr-2023 | 16:12:18 | 1548 | ECR_ENV_09 | | | camera | 87 | 524423 | 6407870 | 524422 | 6407875 | 1 | -4 | 5 | -8 | SG | (Corr'd Nav, Kongsberg 14208, img#23) (V) (T.A) |
| 05-Apr-2023 | 16:12:27 | 1549 | ECR_ENV_09 | | | camera | 86 | 524423 | 6407869 | 524422 | 6407875 | 1 | -6 | 6 | -12 | SG | (Corr'd Nav, Kongsberg 14208, img#24) (V) (T.A) |
| 05-Apr-2023 | 16:12:41 | 1550 | ECR_ENV_09 | | | camera | 86 | 524423 | 6407866 | 524422 | 6407875 | 1 | -9 | 9 | -5 | SG | (Corr'd Nav, Kongsberg 14208, img#25) (V) (T.A) |
| 05-Apr-2023 | 16:12:47 | 1551 | ECR_ENV_09 | | | camera | 86 | 524422 | 6407865 | 524422 | 6407875 | 0 | -10 | 10 | -2 | SG | (Corr'd Nav, Kongsberg 14208, img#26) (V) (T.A) |
| 05-Apr-2023 | 16:12:56 | 1552 | ECR_ENV_09 | | | camera | 86 | 524423 | 6407863 | 524422 | 6407875 | 1 | -12 | 12 | -4 | SG | (Corr'd Nav, Kongsberg 14208, img#27) (V) (T.A) |
| 05-Apr-2023 | 16:13:06 | 1553 | ECR_ENV_09 | | | camera | 86 | 524424 | 6407861 | 524422 | 6407875 | 2 | -14 | 14 | -10 | SG | (Corr'd Nav, Kongsberg 14208, img#28) (V) (T.A) |
| 05-Apr-2023 | 16:13:16 | 1554 | ECR_ENV_09 | | | camera | 86 | 524425 | 6407860 | 524422 | 6407875 | 3 | -15 | 15 | -12 | SG | (Corr'd Nav, Kongsberg 14208, img#29) (V) (T.A) |
| 05-Apr-2023 | 16:13:43 | 1555 | ECR_ENV_09 | | | camera | 86 | 524422 | 6407857 | 524422 | 6407875 | 0 | -18 | 18 | 1 | SG | (Corr'd Nav, Kongsberg 14208, img#30) (V) (T.A) |
| 05-Apr-2023 | 16:13:54 | 1556 | ECR_ENV_09 | | | camera | 86 | 524422 | 6407854 | 524422 | 6407875 | 0 | -21 | 21 | 1 | SG | (Corr'd Nav, Kongsberg 14208, img#31) (V) (T.A) |
| 05-Apr-2023 | 16:14:09 | 1557 | ECR_ENV_09 | | | camera | 86 | 524421 | 6407851 | 524422 | 6407875 | -1 | -24 | 24 | 3 | SG | (Corr'd Nav, Kongsberg 14208, img#32) (V) (T.A) |
| 05-Apr-2023 | 16:14:15 | 1558 | ECR_ENV_09 | | | camera | 86 | 524421 | 6407851 | 524422 | 6407875 | -1 | -24 | 24 | 3 | SG | (Corr'd Nav, Kongsberg 14208, img#33) (V) (T.A) |
| 05-Apr-2023 | 16:14:33 | 1559 | ECR_ENV_09 | | | camera | 86 | 524421 | 6407848 | 524422 | 6407875 | -1 | -27 | 27 | 3 | SG | (Corr'd Nav, Kongsberg 14208, img#34) (V) (T.A) |
| 05-Apr-2023 | 16:14:49 | 1560 | ECR_ENV_09 | | | camera | 86 | 524422 | 6407844 | 524422 | 6407875 | 0 | -31 | 31 | 0 | SG | (Corr'd Nav, Kongsberg 14208, img#35) (V) (T.A) |
| 05-Apr-2023 | 16:14:57 | 1561 | ECR_ENV_09 | | | camera | 86 | 524423 | 6407843 | 524422 | 6407875 | 1 | -32 | 32 | -1 | SG | (Corr'd Nav, Kongsberg 14208, img#36) (V) (T.A) |
| 05-Apr-2023 | 16:15:06 | 1562 | ECR_ENV_09 | | | camera | 86 | 524423 | 6407841 | 524422 | 6407875 | 1 | -34 | 34 | -1 | SG | (Corr'd Nav, Kongsberg 14208, img#37) (V) (T.A) |
| 05-Apr-2023 | 16:15:25 | 1563 | ECR_ENV_09 | | | camera | 86 | 524422 | 6407839 | 524422 | 6407875 | 0 | -36 | 36 | 0 | SG | (Corr'd Nav, Kongsberg 14208, img#38) (V) (T.A) |
| 05-Apr-2023 | 16:15:54 | 1564 | ECR_ENV_09 | | | camera | 86 | 524421 | 6407834 | 524422 | 6407875 | -1 | -41 | 41 | 2 | SG | (Corr'd Nav, Kongsberg 14208, img#39) (V) (T.A) |
| 05-Apr-2023 | 16:16:22 | 1565 | ECR_ENV_09 | | | camera | 86 | 524420 | 6407828 | 524422 | 6407875 | -2 | -47 | 47 | 2 | SG | (Corr'd Nav, Kongsberg 14208, img#40) (V) (T.A) |
| 05-Apr-2023 | 17:49:29 | 1566 | ECR_ENV_27 | | | camera | 89 | 527894 | 6408311 | 527955 | 6408300 | -61 | 11 | 62 | 100 | SG | (Corr'd Nav, Kongsberg 14208, img#1) (V) (T.A) |
| 05-Apr-2023 | 17:49:58 | 1567 | ECR_ENV_27 | | | camera | 89 | 527896 | 6408311 | 527955 | 6408300 | -59 | 11 | 60 | 100 | SG | (Corr'd Nav, Kongsberg 14208, img#2) (V) (T.A) |
| 05-Apr-2023 | 17:50:10 | 1568 | ECR_ENV_27 | | | camera | 89 | 527898 | 6408311 | 527955 | 6408300 | -57 | 10 | 58 | 100 | SG | (Corr'd Nav, Kongsberg 14208, img#3) (V) (T.A) |
| 05-Apr-2023 | 17:50:19 | 1569 | ECR_ENV_27 | | | camera | 89 | 527900 | 6408310 | 527955 | 6408300 | -56 | 10 | 57 | 100 | SG | (Corr'd Nav, Kongsberg 14208, img#4) (V) (T.A) |
| 05-Apr-2023 | 17:51:09 | 1570 | ECR_ENV_27 | | | camera | 89 | 527905 | 6408308 | 527955 | 6408300 | -51 | 8 | 51 | 99 | SG | (Corr'd Nav, Kongsberg 14208, img#5) (V) (T.A) |
| 05-Apr-2023 | 17:51:31 | 1571 | ECR_ENV_27 | | | camera | 89 | 527908 | 6408307 | 527955 | 6408300 | -47 | 7 | 48 | 98 | SG | (Corr'd Nav, Kongsberg 14208, img#6) (V) (T.A) |
| 05-Apr-2023 | 17:51:50 | 1572 | ECR_ENV_27 | | | camera | 89 | 527910 | 6408308 | 527955 | 6408300 | -45 | 7 | 46 | 99 | SG | (Corr'd Nav, Kongsberg 14208, img#7) (V) (T.A) |
| 05-Apr-2023 | 17:52:15 | 1573 | ECR_ENV_27 | | | camera | 89 | 527915 | 6408309 | 527955 | 6408300 | -41 | 8 | 41 | 102 | SG | (Corr'd Nav, Kongsberg 14208, img#8) (V) (T.A) |
| 05-Apr-2023 | 17:52:27 | 1574 | ECR_ENV_27 | | | camera | 89 | 527916 | 6408309 | 527955 | 6408300 | -39 | 9 | 40 | 103 | SG | (Corr'd Nav, Kongsberg 14208, img#9) (V) (T.A) |
| 05-Apr-2023 | 17:52:46 | 1575 | ECR_ENV_27 | | | camera | 89 | 527919 | 6408309 | 527955 | 6408300 | -37 | 9 | 37 | 103 | SG | (Corr'd Nav, Kongsberg 14208, img#10) (V) (T.A) |
| 05-Apr-2023 | 17:53:08 | 1576 | ECR_ENV_27 | | | camera | 89 | 527922 | 6408309 | 527955 | 6408300 | -33 | 8 | 34 | 104 | SG | (Corr'd Nav, Kongsberg 14208, img#11) (V) (T.A) |
| 05-Apr-2023 | 17:53:20 | 1577 | ECR_ENV_27 | | | camera | 89 | 527925 | 6408308 | 527955 | 6408300 | -30 | 8 | 31 | 105 | SG | (Corr'd Nav, Kongsberg 14208, img#12) (V) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 05-Apr-2023 | 17:53:44 | 1578 | ECR_ENV_27 | | | camera | 89 | 527928 | 6408309 | 527955 | 6408300 | -28 | 9 | 29 | 108 | SG | (Corr'd Nav, Kongsberg 14208, img#13) (V) (T.A) |
| 05-Apr-2023 | 17:53:50 | 1579 | ECR_ENV_27 | | | camera | 89 | 527928 | 6408309 | 527955 | 6408300 | -27 | 9 | 28 | 108 | SG | (Corr'd Nav, Kongsberg 14208, img#14) (V) (T.A) |
| 05-Apr-2023 | 17:54:14 | 1580 | ECR_ENV_27 | | | camera | 89 | 527931 | 6408307 | 527955 | 6408300 | -24 | 7 | 25 | 106 | SG | (Corr'd Nav, Kongsberg 14208, img#15) (V) (T.A) |
| 05-Apr-2023 | 17:54:32 | 1581 | ECR_ENV_27 | | | camera | 89 | 527934 | 6408307 | 527955 | 6408300 | -22 | 6 | 23 | 106 | SG | (Corr'd Nav, Kongsberg 14208, img#16) (V) (T.A) |
| 05-Apr-2023 | 17:54:55 | 1582 | ECR_ENV_27 | | | camera | 89 | 527937 | 6408306 | 527955 | 6408300 | -18 | 6 | 19 | 108 | SG | (Corr'd Nav, Kongsberg 14208, img#17) (V) (T.A) |
| 05-Apr-2023 | 17:55:14 | 1583 | ECR_ENV_27 | | | camera | 89 | 527939 | 6408306 | 527955 | 6408300 | -16 | 6 | 17 | 111 | SG | (Corr'd Nav, Kongsberg 14208, img#18) (V) (T.A) # No photo taken |
| 05-Apr-2023 | 17:55:26 | 1584 | ECR_ENV_27 | | | camera | 89 | 527941 | 6408306 | 527955 | 6408300 | -14 | 6 | 15 | 112 | SG | (Corr'd Nav, Kongsberg 14208, img#19) (V) (T.A) # No photo taken |
| 05-Apr-2023 | 17:55:48 | 1585 | ECR_ENV_27 | | | camera | 89 | 527944 | 6408306 | 527955 | 6408300 | -11 | 5 | 12 | 116 | SG | (Corr'd Nav, Kongsberg 14208, img#20) (V) (T.A) |
| 05-Apr-2023 | 17:56:16 | 1586 | ECR_ENV_27 | | | camera | 89 | 527948 | 6408303 | 527955 | 6408300 | -7 | 3 | 8 | 112 | SG | (Corr'd Nav, Kongsberg 14208, img#21) (V) (T.A) |
| 05-Apr-2023 | 17:56:29 | 1587 | ECR_ENV_27 | | | camera | 89 | 527949 | 6408303 | 527955 | 6408300 | -6 | 3 | 7 | 115 | SG | (Corr'd Nav, Kongsberg 14208, img#22) (V) (T.A) |
| 05-Apr-2023 | 17:56:46 | 1588 | ECR_ENV_27 | | | camera | 89 | 527952 | 6408303 | 527955 | 6408300 | -3 | 2 | 4 | 126 | SG | (Corr'd Nav, Kongsberg 14208, img#23) (V) (T.A) |
| 05-Apr-2023 | 17:57:01 | 1589 | ECR_ENV_27 | | | camera | 89 | 527954 | 6408303 | 527955 | 6408300 | -1 | 3 | 3 | 157 | SG | (Corr'd Nav, Kongsberg 14208, img#24) (V) (T.A) |
| 05-Apr-2023 | 17:57:19 | 1590 | ECR_ENV_27 | | | camera | 89 | 527956 | 6408305 | 527955 | 6408300 | 1 | 4 | 4 | -169 | SG | (Corr'd Nav, Kongsberg 14208, img#25) (V) (T.A) |
| 05-Apr-2023 | 17:57:52 | 1591 | ECR_ENV_27 | | | camera | 89 | 527960 | 6408302 | 527955 | 6408300 | 5 | 2 | 5 | -115 | SG | (Corr'd Nav, Kongsberg 14208, img#26) (V) (T.A) |
| 05-Apr-2023 | 17:58:16 | 1592 | ECR_ENV_27 | | | camera | 89 | 527964 | 6408302 | 527955 | 6408300 | 9 | 2 | 9 | -103 | SG | (Corr'd Nav, Kongsberg 14208, img#27) (V) (T.A) |
| 05-Apr-2023 | 17:58:44 | 1593 | ECR_ENV_27 | | | camera | 89 | 527967 | 6408301 | 527955 | 6408300 | 12 | 1 | 12 | -95 | SG | (Corr'd Nav, Kongsberg 14208, img#28) (V) (T.A) |
| 05-Apr-2023 | 17:59:04 | 1594 | ECR_ENV_27 | | | camera | 89 | 527971 | 6408299 | 527955 | 6408300 | 16 | -1 | 16 | -86 | SG | (Corr'd Nav, Kongsberg 14208, img#29) (V) (T.A) |
| 05-Apr-2023 | 17:59:23 | 1595 | ECR_ENV_27 | | | camera | 89 | 527977 | 6408298 | 527955 | 6408300 | 22 | -2 | 22 | -84 | SG | (Corr'd Nav, Kongsberg 14208, img#30) (V) (T.A) |
| 05-Apr-2023 | 17:59:38 | 1596 | ECR_ENV_27 | | | camera | 89 | 527980 | 6408298 | 527955 | 6408300 | 25 | -3 | 25 | -84 | SG | (Corr'd Nav, Kongsberg 14208, img#31) (V) (T.A) |
| 05-Apr-2023 | 17:59:51 | 1597 | ECR_ENV_27 | | | camera | 89 | 527981 | 6408298 | 527955 | 6408300 | 26 | -2 | 26 | -85 | SG | (Corr'd Nav, Kongsberg 14208, img#32) (V) (T.A) |
| 05-Apr-2023 | 18:00:07 | 1598 | ECR_ENV_27 | | | camera | 89 | 527982 | 6408299 | 527955 | 6408300 | 27 | -2 | 27 | -87 | SG | (Corr'd Nav, Kongsberg 14208, img#33) (V) (T.A) |
| 05-Apr-2023 | 18:00:26 | 1599 | ECR_ENV_27 | | | camera | 89 | 527986 | 6408299 | 527955 | 6408300 | 31 | -1 | 31 | -88 | SG | (Corr'd Nav, Kongsberg 14208, img#34) (V) (T.A) |
| 05-Apr-2023 | 18:00:37 | 1600 | ECR_ENV_27 | | | camera | 89 | 527988 | 6408299 | 527955 | 6408300 | 32 | -1 | 32 | -88 | SG | (Corr'd Nav, Kongsberg 14208, img#35) (V) (T.A) |
| 05-Apr-2023 | 18:00:52 | 1601 | ECR_ENV_27 | | | camera | 89 | 527989 | 6408300 | 527955 | 6408300 | 34 | 0 | 34 | -89 | SG | (Corr'd Nav, Kongsberg 14208, img#36) (V) (T.A) |
| 05-Apr-2023 | 18:01:07 | 1602 | ECR_ENV_27 | | | camera | 89 | 527991 | 6408301 | 527955 | 6408300 | 36 | 0 | 36 | -91 | SG | (Corr'd Nav, Kongsberg 14208, img#37) (V) (T.A) |
| 05-Apr-2023 | 18:01:28 | 1603 | ECR_ENV_27 | | | camera | 89 | 527994 | 6408301 | 527955 | 6408300 | 39 | 1 | 39 | -91 | SG | (Corr'd Nav, Kongsberg 14208, img#38) (V) (T.A) |
| 05-Apr-2023 | 18:01:50 | 1604 | ECR_ENV_27 | | | camera | 89 | 527997 | 6408302 | 527955 | 6408300 | 41 | 2 | 42 | -93 | SG | (Corr'd Nav, Kongsberg 14208, img#39) (V) (T.A) |
| 05-Apr-2023 | 18:02:02 | 1605 | ECR_ENV_27 | | | camera | 89 | 527998 | 6408302 | 527955 | 6408300 | 43 | 2 | 43 | -92 | SG | (Corr'd Nav, Kongsberg 14208, img#40) (V) (T.A) |
| 05-Apr-2023 | 18:02:11 | 1606 | ECR_ENV_27 | | | camera | 89 | 528000 | 6408302 | 527955 | 6408300 | 45 | 1 | 45 | -91 | SG | (Corr'd Nav, Kongsberg 14208, img#41) (V) (T.A) |
| 05-Apr-2023 | 18:02:25 | 1607 | ECR_ENV_27 | | | camera | 89 | 528002 | 6408300 | 527955 | 6408300 | 47 | 0 | 47 | -90 | SG | (Corr'd Nav, Kongsberg 14208, img#42) (V) (T.A) |
| 05-Apr-2023 | 18:02:33 | 1608 | ECR_ENV_27 | | | camera | 89 | 528003 | 6408300 | 527955 | 6408300 | 48 | 0 | 48 | -90 | SG | (Corr'd Nav, Kongsberg 14208, img#43) (V) (T.A) |
| 05-Apr-2023 | 21:01:55 | 1609 | ECR_ENV_04 | | | camera | 81 | 526471 | 6410874 | 526524 | 6410862 | -53 | 11 | 54 | 102 | SG | (Corr'd Nav, Kongsberg 14208, img#1) (V) (T.A) |
| 05-Apr-2023 | 21:02:22 | 1610 | ECR_ENV_04 | | | camera | 81 | 526470 | 6410871 | 526524 | 6410862 | -54 | 8 | 54 | 99 | SG | (Corr'd Nav, Kongsberg 14208, img#2) (V) (T.A) |
| 05-Apr-2023 | 21:03:08 | 1611 | ECR_ENV_04 | | | camera | 81 | 526474 | 6410864 | 526524 | 6410862 | -50 | 1 | 50 | 91 | SG | (Corr'd Nav, Kongsberg 14208, img#3) (V) (T.A) |
| 05-Apr-2023 | 21:03:25 | 1612 | ECR_ENV_04 | | | camera | 81 | 526477 | 6410862 | 526524 | 6410862 | -47 | -1 | 47 | 89 | SG | (Corr'd Nav, Kongsberg 14208, img#4) (V) (T.A) |
| 05-Apr-2023 | 21:03:50 | 1613 | ECR_ENV_04 | | | camera | 81 | 526480 | 6410861 | 526524 | 6410862 | -44 | -2 | 44 | 88 | SG | (Corr'd Nav, Kongsberg 14208, img#5) (V) (T.A) |
| 05-Apr-2023 | 21:04:08 | 1614 | ECR_ENV_04 | | | camera | 81 | 526482 | 6410861 | 526524 | 6410862 | -42 | -1 | 42 | 88 | SG | (Corr'd Nav, Kongsberg 14208, img#6) (V) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 05-Apr-2023 | 21:04:29 | 1615 | ECR_ENV_04 | | | camera | 81 | 526485 | 6410862 | 526524 | 6410862 | -39 | -1 | 39 | 89 | SG | (Corr'd Nav, Kongsberg 14208, img#7) (V) (T.A) |
| 05-Apr-2023 | 21:04:58 | 1616 | ECR_ENV_04 | | | camera | 81 | 526488 | 6410862 | 526524 | 6410862 | -36 | 0 | 35 | 90 | SG | (Corr'd Nav, Kongsberg 14208, img#8) (V) (T.A) |
| 05-Apr-2023 | 21:05:22 | 1617 | ECR_ENV_04 | | | camera | 81 | 526491 | 6410863 | 526524 | 6410862 | -33 | 0 | 33 | 91 | SG | (Corr'd Nav, Kongsberg 14208, img#9) (V) (T.A) |
| 05-Apr-2023 | 21:05:33 | 1618 | ECR_ENV_04 | | | camera | 81 | 526492 | 6410863 | 526524 | 6410862 | -32 | 0 | 31 | 91 | SG | (Corr'd Nav, Kongsberg 14208, img#10) (V) (T.A) |
| 05-Apr-2023 | 21:06:01 | 1619 | ECR_ENV_04 | | | camera | 81 | 526496 | 6410862 | 526524 | 6410862 | -28 | 0 | 28 | 89 | SG | (Corr'd Nav, Kongsberg 14208, img#11) (V) (T.A) |
| 05-Apr-2023 | 21:06:57 | 1620 | ECR_ENV_04 | | | camera | 81 | 526501 | 6410860 | 526524 | 6410862 | -23 | -2 | 23 | 85 | SG | (Corr'd Nav, Kongsberg 14208, img#12) (V) (T.A) |
| 05-Apr-2023 | 21:07:24 | 1621 | ECR_ENV_04 | | | camera | 81 | 526504 | 6410862 | 526524 | 6410862 | -20 | 0 | 20 | 89 | SG | (Corr'd Nav, Kongsberg 14208, img#13) (V) (T.A) |
| 05-Apr-2023 | 21:07:43 | 1622 | ECR_ENV_04 | | | camera | 81 | 526506 | 6410863 | 526524 | 6410862 | -18 | 1 | 18 | 92 | SG | (Corr'd Nav, Kongsberg 14208, img#14) (V) (T.A) |
| 05-Apr-2023 | 21:08:29 | 1623 | ECR_ENV_04 | | | camera | 81 | 526510 | 6410860 | 526524 | 6410862 | -14 | -3 | 14 | 79 | SG | (Corr'd Nav, Kongsberg 14208, img#15) (V) (T.A) |
| 05-Apr-2023 | 21:09:04 | 1624 | ECR_ENV_04 | | | camera | 81 | 526513 | 6410860 | 526524 | 6410862 | -11 | -3 | 11 | 76 | SG | (Corr'd Nav, Kongsberg 14208, img#16) (V) (T.A) |
| 05-Apr-2023 | 21:09:34 | 1625 | ECR_ENV_04 | | | camera | 81 | 526516 | 6410861 | 526524 | 6410862 | -7 | -1 | 7 | 82 | SG | (Corr'd Nav, Kongsberg 14208, img#17) (V) (T.A) |
| 05-Apr-2023 | 21:09:48 | 1626 | ECR_ENV_04 | | | camera | 81 | 526518 | 6410862 | 526524 | 6410862 | -6 | 0 | 6 | 87 | SG | (Corr'd Nav, Kongsberg 14208, img#18) (V) (T.A) |
| 05-Apr-2023 | 21:10:03 | 1627 | ECR_ENV_04 | | | camera | 81 | 526520 | 6410862 | 526524 | 6410862 | -4 | 0 | 4 | 88 | SG | (Corr'd Nav, Kongsberg 14208, img#19) (V) (T.A) |
| 05-Apr-2023 | 21:10:20 | 1628 | ECR_ENV_04 | | | camera | 81 | 526522 | 6410863 | 526524 | 6410862 | -2 | 0 | 2 | 95 | SG | (Corr'd Nav, Kongsberg 14208, img#20) (V) (T.A) |
| 05-Apr-2023 | 21:10:28 | 1629 | ECR_ENV_04 | | | camera | 81 | 526523 | 6410863 | 526524 | 6410862 | -1 | 0 | 1 | 113 | SG | (Corr'd Nav, Kongsberg 14208, img#21) (V) (T.A) |
| 05-Apr-2023 | 21:10:39 | 1630 | ECR_ENV_04 | | | camera | 81 | 526524 | 6410863 | 526524 | 6410862 | 0 | 1 | 1 | -161 | SG | (Corr'd Nav, Kongsberg 14208, img#22) (V) (T.A) |
| 05-Apr-2023 | 21:11:13 | 1631 | ECR_ENV_04 | | | camera | 81 | 526528 | 6410863 | 526524 | 6410862 | 4 | 1 | 4 | -98 | SG | (Corr'd Nav, Kongsberg 14208, img#23) (V) (T.A) |
| 05-Apr-2023 | 21:11:25 | 1632 | ECR_ENV_04 | | | camera | 81 | 526529 | 6410863 | 526524 | 6410862 | 5 | 1 | 5 | -96 | SG | (Corr'd Nav, Kongsberg 14208, img#24) (V) (T.A) |
| 05-Apr-2023 | 21:11:44 | 1633 | ECR_ENV_04 | | | camera | 81 | 526531 | 6410863 | 526524 | 6410862 | 7 | 1 | 7 | -94 | SG | (Corr'd Nav, Kongsberg 14208, img#25) (V) (T.A) |
| 05-Apr-2023 | 21:12:06 | 1634 | ECR_ENV_04 | | | camera | 81 | 526534 | 6410862 | 526524 | 6410862 | 10 | -1 | 10 | -85 | SG | (Corr'd Nav, Kongsberg 14208, img#26) (V) (T.A) |
| 05-Apr-2023 | 21:12:29 | 1635 | ECR_ENV_04 | | | camera | 81 | 526537 | 6410861 | 526524 | 6410862 | 13 | -2 | 13 | -83 | SG | (Corr'd Nav, Kongsberg 14208, img#27) (V) (T.A) |
| 05-Apr-2023 | 21:12:50 | 1636 | ECR_ENV_04 | | | camera | 81 | 526540 | 6410860 | 526524 | 6410862 | 16 | -2 | 16 | -82 | SG | (Corr'd Nav, Kongsberg 14208, img#28) (V) (T.A) |
| 05-Apr-2023 | 21:13:10 | 1637 | ECR_ENV_04 | | | camera | 81 | 526543 | 6410861 | 526524 | 6410862 | 19 | -2 | 19 | -85 | SG | (Corr'd Nav, Kongsberg 14208, img#29) (V) (T.A) |
| 05-Apr-2023 | 21:13:18 | 1638 | ECR_ENV_04 | | | camera | 81 | 526544 | 6410861 | 526524 | 6410862 | 20 | -2 | 20 | -86 | SG | (Corr'd Nav, Kongsberg 14208, img#30) (V) (T.A) |
| 05-Apr-2023 | 21:13:32 | 1639 | ECR_ENV_04 | | | camera | 81 | 526546 | 6410862 | 526524 | 6410862 | 23 | -1 | 23 | -88 | SG | (Corr'd Nav, Kongsberg 14208, img#31) (V) (T.A) |
| 05-Apr-2023 | 21:13:42 | 1640 | ECR_ENV_04 | | | camera | 81 | 526548 | 6410862 | 526524 | 6410862 | 24 | 0 | 24 | -90 | SG | (Corr'd Nav, Kongsberg 14208, img#32) (V) (T.A) |
| 05-Apr-2023 | 21:14:04 | 1641 | ECR_ENV_04 | | | camera | 81 | 526550 | 6410864 | 526524 | 6410862 | 27 | 2 | 27 | -94 | SG | (Corr'd Nav, Kongsberg 14208, img#33) (V) (T.A) |
| 05-Apr-2023 | 21:14:12 | 1642 | ECR_ENV_04 | | | camera | 81 | 526551 | 6410864 | 526524 | 6410862 | 28 | 2 | 28 | -94 | SG | (Corr'd Nav, Kongsberg 14208, img#34) (V) (T.A) |
| 05-Apr-2023 | 21:14:24 | 1643 | ECR_ENV_04 | | | camera | 81 | 526553 | 6410864 | 526524 | 6410862 | 29 | 2 | 29 | -94 | SG | (Corr'd Nav, Kongsberg 14208, img#35) (V) (T.A) |
| 05-Apr-2023 | 21:14:42 | 1644 | ECR_ENV_04 | | | camera | 81 | 526555 | 6410863 | 526524 | 6410862 | 31 | 1 | 31 | -91 | SG | (Corr'd Nav, Kongsberg 14208, img#36) (V) (T.A) |
| 05-Apr-2023 | 21:14:53 | 1645 | ECR_ENV_04 | | | camera | 81 | 526556 | 6410863 | 526524 | 6410862 | 32 | 0 | 32 | -90 | SG | (Corr'd Nav, Kongsberg 14208, img#37) (V) (T.A) |
| 05-Apr-2023 | 21:15:05 | 1646 | ECR_ENV_04 | | | camera | 81 | 526558 | 6410862 | 526524 | 6410862 | 34 | 0 | 34 | -90 | SG | (Corr'd Nav, Kongsberg 14208, img#38) (V) (T.A) |
| 05-Apr-2023 | 21:15:17 | 1647 | ECR_ENV_04 | | | camera | 81 | 526560 | 6410862 | 526524 | 6410862 | 36 | 0 | 36 | -89 | SG | (Corr'd Nav, Kongsberg 14208, img#39) (V) (T.A) |
| 05-Apr-2023 | 21:15:28 | 1648 | ECR_ENV_04 | | | camera | 81 | 526561 | 6410862 | 526524 | 6410862 | 37 | -1 | 37 | -89 | SG | (Corr'd Nav, Kongsberg 14208, img#40) (V) (T.A) |
| 05-Apr-2023 | 21:15:36 | 1649 | ECR_ENV_04 | | | camera | 81 | 526562 | 6410861 | 526524 | 6410862 | 39 | -1 | 38 | -88 | SG | (Corr'd Nav, Kongsberg 14208, img#41) (V) (T.A) |
| 05-Apr-2023 | 21:15:52 | 1650 | ECR_ENV_04 | | | camera | 81 | 526565 | 6410861 | 526524 | 6410862 | 41 | -2 | 41 | -88 | SG | (Corr'd Nav, Kongsberg 14208, img#42) (V) (T.A) |
| 05-Apr-2023 | 21:16:08 | 1651 | ECR_ENV_04 | | | camera | 81 | 526567 | 6410860 | 526524 | 6410862 | 43 | -2 | 43 | -87 | SG | (Corr'd Nav, Kongsberg 14208, img#43) (V) (T.A) |
| 05-Apr-2023 | 21:16:22 | 1652 | ECR_ENV_04 | | | camera | 81 | 526569 | 6410860 | 526524 | 6410862 | 45 | -2 | 45 | -87 | SG | (Corr'd Nav, Kongsberg 14208, img#44) (V) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 05-Apr-2023 | 21:16:36 | 1653 | ECR_ENV_04 | | | camera | 81 | 526571 | 6410860 | 526524 | 6410862 | 47 | -3 | 47 | -87 | SG | (Corr'd Nav, Kongsberg 14208, img#45) (V) (T.A) |
| 05-Apr-2023 | 22:49:44 | 1654 | ECR_ENV_19 | | | camera | 76 | 526319 | 6412242 | 526293 | 6412287 | 26 | -45 | 52 | -30 | SG | (Corr'd Nav, Kongsberg 14208, img#1) (V) (T.A) |
| 05-Apr-2023 | 22:50:18 | 1655 | ECR_ENV_19 | | | camera | 76 | 526317 | 6412246 | 526293 | 6412287 | 24 | -41 | 47 | -31 | SG | (Corr'd Nav, Kongsberg 14208, img#2) (V) (T.A) |
| 05-Apr-2023 | 22:50:40 | 1656 | ECR_ENV_19 | | | camera | 76 | 526316 | 6412248 | 526293 | 6412287 | 22 | -39 | 45 | -30 | SG | (Corr'd Nav, Kongsberg 14208, img#3) (V) (T.A) |
| 05-Apr-2023 | 22:50:54 | 1657 | ECR_ENV_19 | | | camera | 76 | 526314 | 6412249 | 526293 | 6412287 | 21 | -38 | 43 | -29 | SG | (Corr'd Nav, Kongsberg 14208, img#4) (V) (T.A) |
| 05-Apr-2023 | 22:51:14 | 1658 | ECR_ENV_19 | | | camera | 76 | 526314 | 6412252 | 526293 | 6412287 | 20 | -35 | 41 | -30 | SG | (Corr'd Nav, Kongsberg 14208, img#5) (V) (T.A) |
| 05-Apr-2023 | 22:51:30 | 1659 | ECR_ENV_19 | | | camera | 76 | 526313 | 6412254 | 526293 | 6412287 | 20 | -33 | 38 | -31 | SG | (Corr'd Nav, Kongsberg 14208, img#6) (V) (T.A) |
| 05-Apr-2023 | 22:51:41 | 1660 | ECR_ENV_19 | | | camera | 76 | 526313 | 6412256 | 526293 | 6412287 | 20 | -31 | 37 | -32 | SG | (Corr'd Nav, Kongsberg 14208, img#7) (V) (T.A) |
| 05-Apr-2023 | 22:52:10 | 1661 | ECR_ENV_19 | | | camera | 76 | 526312 | 6412259 | 526293 | 6412287 | 19 | -28 | 33 | -34 | SG | (Corr'd Nav, Kongsberg 14208, img#8) (V) (T.A) |
| 05-Apr-2023 | 22:52:19 | 1662 | ECR_ENV_19 | | | camera | 76 | 526311 | 6412260 | 526293 | 6412287 | 18 | -27 | 32 | -33 | SG | (Corr'd Nav, Kongsberg 14208, img#9) (V) (T.A) |
| 05-Apr-2023 | 22:52:39 | 1663 | ECR_ENV_19 | | | camera | 76 | 526309 | 6412261 | 526293 | 6412287 | 16 | -25 | 30 | -33 | SG | (Corr'd Nav, Kongsberg 14208, img#10) (V) (T.A) |
| 05-Apr-2023 | 22:52:54 | 1664 | ECR_ENV_19 | | | camera | 76 | 526309 | 6412262 | 526293 | 6412287 | 15 | -25 | 29 | -32 | SG | (Corr'd Nav, Kongsberg 14208, img#11) (V) (T.A) |
| 05-Apr-2023 | 22:53:11 | 1665 | ECR_ENV_19 | | | camera | 76 | 526307 | 6412263 | 526293 | 6412287 | 14 | -23 | 27 | -31 | SG | (Corr'd Nav, Kongsberg 14208, img#12) (V) (T.A) |
| 05-Apr-2023 | 22:53:32 | 1666 | ECR_ENV_19 | | | camera | 76 | 526307 | 6412266 | 526293 | 6412287 | 14 | -21 | 25 | -33 | SG | (Corr'd Nav, Kongsberg 14208, img#13) (V) (T.A) |
| 05-Apr-2023 | 22:53:46 | 1667 | ECR_ENV_19 | | | camera | 76 | 526306 | 6412267 | 526293 | 6412287 | 13 | -20 | 24 | -33 | SG | (Corr'd Nav, Kongsberg 14208, img#14) (V) (T.A) |
| 05-Apr-2023 | 22:54:04 | 1668 | ECR_ENV_19 | | | camera | 76 | 526305 | 6412268 | 526293 | 6412287 | 11 | -19 | 22 | -31 | SG | (Corr'd Nav, Kongsberg 14208, img#15) (V) (T.A) |
| 05-Apr-2023 | 22:54:21 | 1669 | ECR_ENV_19 | | | camera | 76 | 526303 | 6412269 | 526293 | 6412287 | 10 | -18 | 21 | -29 | SG | (Corr'd Nav, Kongsberg 14208, img#16) (V) (T.A) |
| 05-Apr-2023 | 22:54:43 | 1670 | ECR_ENV_19 | | | camera | 76 | 526302 | 6412270 | 526293 | 6412287 | 9 | -17 | 19 | -27 | SG | (Corr'd Nav, Kongsberg 14208, img#17) (V) (T.A) |
| 05-Apr-2023 | 22:55:06 | 1671 | ECR_ENV_19 | | | camera | 76 | 526301 | 6412272 | 526293 | 6412287 | 8 | -15 | 16 | -28 | SG | (Corr'd Nav, Kongsberg 14208, img#18) (V) (T.A) |
| 05-Apr-2023 | 22:55:49 | 1672 | ECR_ENV_19 | | | camera | 76 | 526300 | 6412276 | 526293 | 6412287 | 7 | -11 | 12 | -32 | SG | (Corr'd Nav, Kongsberg 14208, img#19) (V) (T.A) |
| 05-Apr-2023 | 22:56:12 | 1673 | ECR_ENV_19 | | | camera | 76 | 526298 | 6412279 | 526293 | 6412287 | 5 | -8 | 9 | -34 | SG | (Corr'd Nav, Kongsberg 14208, img#20) (V) (T.A) |
| 05-Apr-2023 | 22:56:26 | 1674 | ECR_ENV_19 | | | camera | 76 | 526298 | 6412281 | 526293 | 6412287 | 5 | -6 | 7 | -38 | SG | (Corr'd Nav, Kongsberg 14208, img#21) (V) (T.A) |
| 05-Apr-2023 | 22:56:40 | 1675 | ECR_ENV_19 | | | camera | 76 | 526297 | 6412283 | 526293 | 6412287 | 3 | -4 | 5 | -39 | SG | (Corr'd Nav, Kongsberg 14208, img#22) (V) (T.A) |
| 05-Apr-2023 | 22:57:09 | 1676 | ECR_ENV_19 | | | camera | 76 | 526294 | 6412284 | 526293 | 6412287 | 1 | -2 | 3 | -17 | SG | (Corr'd Nav, Kongsberg 14208, img#23) (V) (T.A) |
| 05-Apr-2023 | 22:57:22 | 1677 | ECR_ENV_19 | | | camera | 76 | 526293 | 6412285 | 526293 | 6412287 | 0 | -2 | 2 | 10 | SG | (Corr'd Nav, Kongsberg 14208, img#24) (V) (T.A) |
| 05-Apr-2023 | 22:57:37 | 1678 | ECR_ENV_19 | | | camera | 76 | 526293 | 6412286 | 526293 | 6412287 | 0 | -1 | 1 | 20 | SG | (Corr'd Nav, Kongsberg 14208, img#25) (V) (T.A) |
| 05-Apr-2023 | 22:58:10 | 1679 | ECR_ENV_19 | | | camera | 76 | 526294 | 6412290 | 526293 | 6412287 | 1 | 4 | 4 | -170 | SG | (Corr'd Nav, Kongsberg 14208, img#26) (V) (T.A) |
| 05-Apr-2023 | 22:58:33 | 1680 | ECR_ENV_19 | | | camera | 76 | 526292 | 6412293 | 526293 | 6412287 | -2 | 6 | 6 | 165 | SG | (Corr'd Nav, Kongsberg 14208, img#27) (V) (T.A) |
| 05-Apr-2023 | 22:58:58 | 1681 | ECR_ENV_19 | | | camera | 76 | 526291 | 6412297 | 526293 | 6412287 | -2 | 10 | 10 | 166 | SG | (Corr'd Nav, Kongsberg 14208, img#28) (V) (T.A) |
| 05-Apr-2023 | 22:59:15 | 1682 | ECR_ENV_19 | | | camera | 76 | 526289 | 6412299 | 526293 | 6412287 | -4 | 12 | 13 | 160 | SG | (Corr'd Nav, Kongsberg 14208, img#29) (V) (T.A) |
| 05-Apr-2023 | 22:59:24 | 1683 | ECR_ENV_19 | | | camera | 76 | 526288 | 6412300 | 526293 | 6412287 | -5 | 13 | 14 | 160 | SG | (Corr'd Nav, Kongsberg 14208, img#30) (V) (T.A) |
| 05-Apr-2023 | 22:59:42 | 1684 | ECR_ENV_19 | | | camera | 76 | 526288 | 6412301 | 526293 | 6412287 | -5 | 15 | 15 | 161 | SG | (Corr'd Nav, Kongsberg 14208, img#31) (V) (T.A) |
| 05-Apr-2023 | 23:00:06 | 1685 | ECR_ENV_19 | | | camera | 76 | 526286 | 6412303 | 526293 | 6412287 | -7 | 17 | 18 | 158 | SG | (Corr'd Nav, Kongsberg 14208, img#32) (V) (T.A) |
| 05-Apr-2023 | 23:00:18 | 1686 | ECR_ENV_19 | | | camera | 76 | 526286 | 6412304 | 526293 | 6412287 | -7 | 17 | 18 | 157 | SG | (Corr'd Nav, Kongsberg 14208, img#33) (V) (T.A) |
| 05-Apr-2023 | 23:00:39 | 1687 | ECR_ENV_19 | | | camera | 76 | 526285 | 6412304 | 526293 | 6412287 | -8 | 17 | 19 | 153 | SG | (Corr'd Nav, Kongsberg 14208, img#34) (V) (T.A) |
| 05-Apr-2023 | 23:00:57 | 1688 | ECR_ENV_19 | | | camera | 76 | 526284 | 6412305 | 526293 | 6412287 | -9 | 18 | 21 | 154 | SG | (Corr'd Nav, Kongsberg 14208, img#35) (V) (T.A) |
| 05-Apr-2023 | 23:01:32 | 1689 | ECR_ENV_19 | | | camera | 76 | 526283 | 6412308 | 526293 | 6412287 | -10 | 21 | 23 | 154 | SG | (Corr'd Nav, Kongsberg 14208, img#36) (V) (T.A) |
| 05-Apr-2023 | 23:01:51 | 1690 | ECR_ENV_19 | | | camera | 76 | 526282 | 6412309 | 526293 | 6412287 | -11 | 22 | 25 | 153 | SG | (Corr'd Nav, Kongsberg 14208, img#37) (V) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | | x | 6.7 | y | 21.94 | z | 2.93 | |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | | | | Vertical / Tidal Datum | VORF, LAT | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 05-Apr-2023 | 23:02:06 | 1691 | ECR_ENV_19 | | | camera | 76 | 526282 | 6412311 | 526293 | 6412287 | -11 | 24 | 26 | 155 | SG | (Corr'd Nav, Kongsberg 14208, img#38) (V) (T.A) |
| 05-Apr-2023 | 23:02:20 | 1692 | ECR_ENV_19 | | | camera | 76 | 526282 | 6412312 | 526293 | 6412287 | -12 | 25 | 27 | 155 | SG | (Corr'd Nav, Kongsberg 14208, img#39) (V) (T.A) |
| 05-Apr-2023 | 23:02:42 | 1693 | ECR_ENV_19 | | | camera | 76 | 526282 | 6412313 | 526293 | 6412287 | -11 | 26 | 28 | 157 | SG | (Corr'd Nav, Kongsberg 14208, img#40) (V) (T.A) |
| 05-Apr-2023 | 23:03:10 | 1694 | ECR_ENV_19 | | | camera | 76 | 526281 | 6412315 | 526293 | 6412287 | -12 | 28 | 31 | 157 | SG | (Corr'd Nav, Kongsberg 14208, img#41) (V) (T.A) |
| 05-Apr-2023 | 23:03:45 | 1695 | ECR_ENV_19 | | | camera | 76 | 526279 | 6412318 | 526293 | 6412287 | -14 | 31 | 34 | 156 | SG | (Corr'd Nav, Kongsberg 14208, img#42) (V) (T.A) |
| 05-Apr-2023 | 23:03:59 | 1696 | ECR_ENV_19 | | | camera | 76 | 526279 | 6412320 | 526293 | 6412287 | -14 | 33 | 36 | 157 | SG | (Corr'd Nav, Kongsberg 14208, img#43) (V) (T.A) |
| 05-Apr-2023 | 23:04:22 | 1697 | ECR_ENV_19 | | | camera | 76 | 526280 | 6412324 | 526293 | 6412287 | -13 | 37 | 39 | 161 | SG | (Corr'd Nav, Kongsberg 14208, img#44) (V) (T.A) |
| 05-Apr-2023 | 23:04:50 | 1698 | ECR_ENV_19 | | | camera | 76 | 526280 | 6412328 | 526293 | 6412287 | -14 | 41 | 43 | 161 | SG | (Corr'd Nav, Kongsberg 14208, img#45) (V) (T.A) |
| 05-Apr-2023 | 23:05:02 | 1699 | ECR_ENV_19 | | | camera | 76 | 526279 | 6412329 | 526293 | 6412287 | -15 | 42 | 44 | 161 | SG | (Corr'd Nav, Kongsberg 14208, img#46) (V) (T.A) |
| 06-Apr-2023 | 00:47:30 | 1700 | ECR_ENV_23 | | | camera | 71 | 526760 | 6414366 | 526710 | 6414359 | 50 | 7 | 51 | -98 | PL | (Corr'd Nav, Kongsberg 14208, img#1) (V) (T.A) |
| 06-Apr-2023 | 00:48:46 | 1701 | ECR_ENV_23 | | | camera | 71 | 526750 | 6414362 | 526710 | 6414359 | 40 | 3 | 40 | -95 | PL | (Corr'd Nav, Kongsberg 14208, img#2) (V) (T.A) |
| 06-Apr-2023 | 00:48:55 | 1702 | ECR_ENV_23 | | | camera | 71 | 526748 | 6414361 | 526710 | 6414359 | 38 | 2 | 38 | -93 | PL | (Corr'd Nav, Kongsberg 14208, img#3) (V) (T.A) |
| 06-Apr-2023 | 00:49:22 | 1703 | ECR_ENV_23 | | | camera | 71 | 526742 | 6414355 | 526710 | 6414359 | 32 | -4 | 33 | -82 | PL | (Corr'd Nav, Kongsberg 14208, img#4) (V) (T.A) |
| 06-Apr-2023 | 00:49:37 | 1704 | ECR_ENV_23 | | | camera | 71 | 526739 | 6414354 | 526710 | 6414359 | 29 | -5 | 29 | -81 | PL | (Corr'd Nav, Kongsberg 14208, img#5) (V) (T.A) |
| 06-Apr-2023 | 00:49:48 | 1705 | ECR_ENV_23 | | | camera | 71 | 526738 | 6414355 | 526710 | 6414359 | 28 | -4 | 28 | -82 | PL | (Corr'd Nav, Kongsberg 14208, img#6) (V) (T.A) |
| 06-Apr-2023 | 00:50:04 | 1706 | ECR_ENV_23 | | | camera | 71 | 526736 | 6414356 | 526710 | 6414359 | 26 | -3 | 26 | -83 | PL | (Corr'd Nav, Kongsberg 14208, img#7) (V) (T.A) |
| 06-Apr-2023 | 00:50:14 | 1707 | ECR_ENV_23 | | | camera | 71 | 526733 | 6414355 | 526710 | 6414359 | 23 | -4 | 24 | -81 | PL | (Corr'd Nav, Kongsberg 14208, img#8) (V) (T.A) |
| 06-Apr-2023 | 00:50:38 | 1708 | ECR_ENV_23 | | | camera | 71 | 526729 | 6414358 | 526710 | 6414359 | 19 | -1 | 19 | -86 | PL | (Corr'd Nav, Kongsberg 14208, img#9) (V) (T.A) |
| 06-Apr-2023 | 00:50:44 | 1709 | ECR_ENV_23 | | | camera | 71 | 526728 | 6414359 | 526710 | 6414359 | 19 | 0 | 18 | -89 | PL | (Corr'd Nav, Kongsberg 14208, img#10) (V) (T.A) |
| 06-Apr-2023 | 00:50:54 | 1710 | ECR_ENV_23 | | | camera | 71 | 526726 | 6414360 | 526710 | 6414359 | 16 | 1 | 16 | -92 | PL | (Corr'd Nav, Kongsberg 14208, img#11) (V) (T.A) |
| 06-Apr-2023 | 00:51:08 | 1711 | ECR_ENV_23 | | | camera | 71 | 526723 | 6414359 | 526710 | 6414359 | 13 | 0 | 13 | -89 | PL | (Corr'd Nav, Kongsberg 14208, img#12) (V) (T.A) |
| 06-Apr-2023 | 00:51:16 | 1712 | ECR_ENV_23 | | | camera | 71 | 526721 | 6414358 | 526710 | 6414359 | 11 | -1 | 11 | -83 | PL | (Corr'd Nav, Kongsberg 14208, img#13) (V) (T.A) |
| 06-Apr-2023 | 00:51:23 | 1713 | ECR_ENV_23 | | | camera | 71 | 526720 | 6414358 | 526710 | 6414359 | 10 | -2 | 10 | -81 | PL | (Corr'd Nav, Kongsberg 14208, img#14) (V) (T.A) |
| 06-Apr-2023 | 00:51:31 | 1714 | ECR_ENV_23 | | | camera | 71 | 526719 | 6414358 | 526710 | 6414359 | 9 | -1 | 9 | -85 | PL | (Corr'd Nav, Kongsberg 14208, img#15) (V) (T.A) |
| 06-Apr-2023 | 00:51:40 | 1715 | ECR_ENV_23 | | | camera | 71 | 526717 | 6414360 | 526710 | 6414359 | 8 | 0 | 8 | -94 | PL | (Corr'd Nav, Kongsberg 14208, img#16) (V) (T.A) |
| 06-Apr-2023 | 00:51:55 | 1716 | ECR_ENV_23 | | | camera | 71 | 526716 | 6414360 | 526710 | 6414359 | 6 | 0 | 6 | -94 | PL | (Corr'd Nav, Kongsberg 14208, img#17) (V) (T.A) |
| 06-Apr-2023 | 00:52:07 | 1717 | ECR_ENV_23 | | | camera | 71 | 526714 | 6414357 | 526710 | 6414359 | 4 | -2 | 4 | -69 | PL | (Corr'd Nav, Kongsberg 14208, img#18) (V) (T.A) |
| 06-Apr-2023 | 00:52:27 | 1718 | ECR_ENV_23 | | | camera | 71 | 526711 | 6414358 | 526710 | 6414359 | 1 | -1 | 1 | -49 | PL | (Corr'd Nav, Kongsberg 14208, img#19) (V) (T.A) |
| 06-Apr-2023 | 00:53:00 | 1719 | ECR_ENV_23 | | | camera | 71 | 526705 | 6414359 | 526710 | 6414359 | -5 | 0 | 5 | 89 | PL | (Corr'd Nav, Kongsberg 14208, img#20) (V) (T.A) |
| 06-Apr-2023 | 00:53:06 | 1720 | ECR_ENV_23 | | | camera | 71 | 526704 | 6414357 | 526710 | 6414359 | -5 | -2 | 6 | 73 | PL | (Corr'd Nav, Kongsberg 14208, img#21) (V) (T.A) |
| 06-Apr-2023 | 00:53:14 | 1721 | ECR_ENV_23 | | | camera | 71 | 526703 | 6414356 | 526710 | 6414359 | -6 | -3 | 7 | 65 | PL | (Corr'd Nav, Kongsberg 14208, img#22) (V) (T.A) |
| 06-Apr-2023 | 00:53:20 | 1722 | ECR_ENV_23 | | | camera | 71 | 526702 | 6414356 | 526710 | 6414359 | -7 | -3 | 8 | 66 | PL | (Corr'd Nav, Kongsberg 14208, img#23) (V) (T.A) |
| 06-Apr-2023 | 00:53:37 | 1723 | ECR_ENV_23 | | | camera | 71 | 526701 | 6414359 | 526710 | 6414359 | -9 | 0 | 9 | 87 | PL | (Corr'd Nav, Kongsberg 14208, img#24) (V) (T.A) |
| 06-Apr-2023 | 00:53:46 | 1724 | ECR_ENV_23 | | | camera | 71 | 526700 | 6414360 | 526710 | 6414359 | -10 | 1 | 10 | 97 | PL | (Corr'd Nav, Kongsberg 14208, img#25) (V) (T.A) |
| 06-Apr-2023 | 00:53:56 | 1725 | ECR_ENV_23 | | | camera | 71 | 526698 | 6414361 | 526710 | 6414359 | -12 | 2 | 12 | 99 | PL | (Corr'd Nav, Kongsberg 14208, img#26) (V) (T.A) |
| 06-Apr-2023 | 00:54:12 | 1726 | ECR_ENV_23 | | | camera | 71 | 526695 | 6414361 | 526710 | 6414359 | -15 | 2 | 15 | 97 | PL | (Corr'd Nav, Kongsberg 14208, img#27) (V) (T.A) |
| 06-Apr-2023 | 00:54:35 | 1727 | ECR_ENV_23 | | | camera | 71 | 526689 | 6414359 | 526710 | 6414359 | -21 | 0 | 21 | 90 | PL | (Corr'd Nav, Kongsberg 14208, img#28) (V) (T.A) |
| 06-Apr-2023 | 00:54:48 | 1728 | ECR_ENV_23 | | | camera | 71 | 526687 | 6414357 | 526710 | 6414359 | -23 | -2 | 23 | 84 | PL | (Corr'd Nav, Kongsberg 14208, img#29) (V) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 06-Apr-2023 | 00:55:05 | 1729 | ECR_ENV_23 | | | camera | 71 | 526684 | 6414356 | 526710 | 6414359 | -25 | -3 | 26 | 82 | PL | (Corr'd Nav, Kongsberg 14208, img#30) (V) (T.A) |
| 06-Apr-2023 | 00:55:14 | 1730 | ECR_ENV_23 | | | camera | 71 | 526682 | 6414356 | 526710 | 6414359 | -28 | -3 | 28 | 84 | PL | (Corr'd Nav, Kongsberg 14208, img#31) (V) (T.A) |
| 06-Apr-2023 | 00:55:21 | 1731 | ECR_ENV_23 | | | camera | 71 | 526681 | 6414357 | 526710 | 6414359 | -29 | -2 | 29 | 85 | PL | (Corr'd Nav, Kongsberg 14208, img#32) (V) (T.A) |
| 06-Apr-2023 | 00:55:46 | 1732 | ECR_ENV_23 | | | camera | 71 | 526678 | 6414360 | 526710 | 6414359 | -32 | 1 | 32 | 91 | PL | (Corr'd Nav, Kongsberg 14208, img#33) (V) (T.A) |
| 06-Apr-2023 | 00:55:58 | 1733 | ECR_ENV_23 | | | camera | 71 | 526675 | 6414360 | 526710 | 6414359 | -35 | 1 | 35 | 91 | PL | (Corr'd Nav, Kongsberg 14208, img#34) (V) (T.A) |
| 06-Apr-2023 | 00:56:08 | 1734 | ECR_ENV_23 | | | camera | 71 | 526673 | 6414358 | 526710 | 6414359 | -37 | -1 | 37 | 89 | PL | (Corr'd Nav, Kongsberg 14208, img#35) (V) (T.A) |
| 06-Apr-2023 | 00:56:16 | 1735 | ECR_ENV_23 | | | camera | 71 | 526671 | 6414357 | 526710 | 6414359 | -39 | -2 | 39 | 87 | PL | (Corr'd Nav, Kongsberg 14208, img#36) (V) (T.A) |
| 06-Apr-2023 | 00:56:41 | 1736 | ECR_ENV_23 | | | camera | 71 | 526666 | 6414360 | 526710 | 6414359 | -43 | 1 | 43 | 91 | PL | (Corr'd Nav, Kongsberg 14208, img#37) (V) (T.A) |
| 06-Apr-2023 | 00:56:50 | 1737 | ECR_ENV_23 | | | camera | 71 | 526665 | 6414361 | 526710 | 6414359 | -45 | 2 | 45 | 93 | PL | (Corr'd Nav, Kongsberg 14208, img#38) (V) (T.A) |
| 06-Apr-2023 | 00:57:29 | 1738 | ECR_ENV_23 | | | camera | 71 | 526664 | 6414358 | 526710 | 6414359 | -46 | -1 | 46 | 88 | PL | (Corr'd Nav, Kongsberg 14208, img#39) (V) (T.A) |
| 06-Apr-2023 | 00:58:07 | 1739 | ECR_ENV_23 | | | camera | 71 | 526663 | 6414360 | 526710 | 6414359 | -47 | 1 | 47 | 91 | PL | (Corr'd Nav, Kongsberg 14208, img#40) (V) (T.A) |
| 06-Apr-2023 | 02:40:47 | 1740 | ECR_ENV_06 | | | camera | 69 | 527976 | 6415833 | 527936 | 6415791 | 39 | 42 | 57 | -136 | PL | (Corr'd Nav, Kongsberg 14208, img#1) (B) (T.A) |
| 06-Apr-2023 | 02:41:32 | 1741 | ECR_ENV_06 | | | camera | 69 | 527976 | 6415834 | 527936 | 6415791 | 40 | 42 | 58 | -137 | PL | (Corr'd Nav, Kongsberg 14208, img#2) (B) (T.A) |
| 06-Apr-2023 | 02:41:57 | 1742 | ECR_ENV_06 | | | camera | 69 | 527973 | 6415831 | 527936 | 6415791 | 37 | 39 | 54 | -137 | PL | (Corr'd Nav, Kongsberg 14208, img#3) (B) (T.A) |
| 06-Apr-2023 | 02:42:11 | 1743 | ECR_ENV_06 | | | camera | 69 | 527970 | 6415829 | 527936 | 6415791 | 34 | 38 | 51 | -139 | PL | (Corr'd Nav, Kongsberg 14208, img#4) (B) (T.A) |
| 06-Apr-2023 | 02:42:30 | 1744 | ECR_ENV_06 | | | camera | 69 | 527969 | 6415826 | 527936 | 6415791 | 33 | 35 | 48 | -137 | PL | (Corr'd Nav, Kongsberg 14208, img#5) (B) (T.A) |
| 06-Apr-2023 | 02:43:14 | 1745 | ECR_ENV_06 | | | camera | 69 | 527965 | 6415823 | 527936 | 6415791 | 29 | 32 | 43 | -138 | PL | (Corr'd Nav, Kongsberg 14208, img#6) (B) (T.A) |
| 06-Apr-2023 | 02:43:40 | 1746 | ECR_ENV_06 | | | camera | 69 | 527960 | 6415821 | 527936 | 6415791 | 24 | 30 | 38 | -141 | PL | (Corr'd Nav, Kongsberg 14208, img#7) (B) (T.A) |
| 06-Apr-2023 | 02:44:21 | 1747 | ECR_ENV_06 | | | camera | 69 | 527954 | 6415814 | 527936 | 6415791 | 18 | 23 | 29 | -142 | PL | (Corr'd Nav, Kongsberg 14208, img#8) (B) (T.A) |
| 06-Apr-2023 | 02:44:28 | 1748 | ECR_ENV_06 | | | camera | 69 | 527954 | 6415812 | 527936 | 6415791 | 18 | 21 | 27 | -140 | PL | (Corr'd Nav, Kongsberg 14208, img#9) (B) (T.A) |
| 06-Apr-2023 | 02:44:53 | 1749 | ECR_ENV_06 | | | camera | 69 | 527950 | 6415811 | 527936 | 6415791 | 14 | 20 | 24 | -145 | PL | (Corr'd Nav, Kongsberg 14208, img#10) (B) (T.A) |
| 06-Apr-2023 | 02:45:12 | 1750 | ECR_ENV_06 | | | camera | 69 | 527949 | 6415808 | 527936 | 6415791 | 12 | 17 | 21 | -143 | PL | (Corr'd Nav, Kongsberg 14208, img#11) (B) (T.A) |
| 06-Apr-2023 | 02:45:49 | 1751 | ECR_ENV_06 | | | camera | 69 | 527944 | 6415801 | 527936 | 6415791 | 7 | 10 | 12 | -144 | PL | (Corr'd Nav, Kongsberg 14208, img#12) (B) (T.A) |
| 06-Apr-2023 | 02:48:48 | 1752 | ECR_ENV_06 | | | camera | 69 | 527933 | 6415797 | 527936 | 6415791 | -3 | 6 | 7 | 151 | PL | (Corr'd Nav, Kongsberg 14208, img#13) (B) (T.A) |
| 06-Apr-2023 | 02:49:16 | 1753 | ECR_ENV_06 | | | camera | 69 | 527933 | 6415796 | 527936 | 6415791 | -4 | 5 | 6 | 145 | PL | (Corr'd Nav, Kongsberg 14208, img#14) (B) (T.A) |
| 06-Apr-2023 | 02:49:26 | 1754 | ECR_ENV_06 | | | camera | 70 | 527932 | 6415796 | 527936 | 6415791 | -4 | 5 | 6 | 136 | PL | (Corr'd Nav, Kongsberg 14208, img#15) (B) (T.A) |
| 06-Apr-2023 | 02:49:32 | 1755 | ECR_ENV_06 | | | camera | 69 | 527931 | 6415795 | 527936 | 6415791 | -6 | 4 | 7 | 127 | PL | (Corr'd Nav, Kongsberg 14208, img#16) (B) (T.A) |
| 06-Apr-2023 | 02:49:38 | 1756 | ECR_ENV_06 | | | camera | 69 | 527931 | 6415795 | 527936 | 6415791 | -6 | 4 | 7 | 123 | PL | (Corr'd Nav, Kongsberg 14208, img#17) (B) (T.A) |
| 06-Apr-2023 | 02:49:43 | 1757 | ECR_ENV_06 | | | camera | 69 | 527931 | 6415794 | 527936 | 6415791 | -5 | 3 | 6 | 119 | PL | (Corr'd Nav, Kongsberg 14208, img#18) (B) (T.A) |
| 06-Apr-2023 | 02:49:48 | 1758 | ECR_ENV_06 | | | camera | 69 | 527931 | 6415793 | 527936 | 6415791 | -5 | 2 | 6 | 113 | PL | (Corr'd Nav, Kongsberg 14208, img#19) (B) (T.A) |
| 06-Apr-2023 | 02:50:23 | 1759 | ECR_ENV_06 | | | camera | 69 | 527927 | 6415790 | 527936 | 6415791 | -10 | -1 | 10 | 86 | PL | (Corr'd Nav, Kongsberg 14208, img#20) (B) (T.A) |
| 06-Apr-2023 | 02:50:31 | 1760 | ECR_ENV_06 | | | camera | 69 | 527924 | 6415791 | 527936 | 6415791 | -12 | 0 | 12 | 88 | PL | (Corr'd Nav, Kongsberg 14208, img#21) (B) (T.A) |
| 06-Apr-2023 | 02:50:59 | 1761 | ECR_ENV_06 | | | camera | 69 | 527920 | 6415787 | 527936 | 6415791 | -17 | -5 | 17 | 75 | PL | (Corr'd Nav, Kongsberg 14208, img#22) (B) (T.A) |
| 06-Apr-2023 | 02:51:06 | 1762 | ECR_ENV_06 | | | camera | 69 | 527922 | 6415783 | 527936 | 6415791 | -14 | -8 | 17 | 60 | PL | (Corr'd Nav, Kongsberg 14208, img#23) (B) (T.A) |
| 06-Apr-2023 | 02:51:21 | 1763 | ECR_ENV_06 | | | camera | 69 | 527920 | 6415782 | 527936 | 6415791 | -16 | -9 | 18 | 62 | PL | (Corr'd Nav, Kongsberg 14208, img#24) (B) (T.A) |
| 06-Apr-2023 | 02:51:35 | 1764 | ECR_ENV_06 | | | camera | 69 | 527918 | 6415782 | 527936 | 6415791 | -18 | -9 | 20 | 64 | PL | (Corr'd Nav, Kongsberg 14208, img#25) (B) (T.A) |
| 06-Apr-2023 | 02:51:46 | 1765 | ECR_ENV_06 | | | camera | 69 | 527918 | 6415783 | 527936 | 6415791 | -18 | -8 | 20 | 65 | PL | (Corr'd Nav, Kongsberg 14208, img#26) (B) (T.A) |
| 06-Apr-2023 | 02:51:56 | 1766 | ECR_ENV_06 | | | camera | 69 | 527917 | 6415781 | 527936 | 6415791 | -19 | -10 | 21 | 62 | PL | (Corr'd Nav, Kongsberg 14208, img#27) (B) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 06-Apr-2023 | 02:52:13 | 1767 | ECR_ENV_06 | | | camera | 69 | 527912 | 6415779 | 527936 | 6415791 | -24 | -12 | 27 | 63 | PL | (Corr'd Nav, Kongsberg 14208, img#28) (B) (T.A) |
| 06-Apr-2023 | 02:52:20 | 1768 | ECR_ENV_06 | | | camera | 69 | 527912 | 6415777 | 527936 | 6415791 | -24 | -14 | 28 | 60 | PL | (Corr'd Nav, Kongsberg 14208, img#29) (B) (T.A) |
| 06-Apr-2023 | 02:52:38 | 1769 | ECR_ENV_06 | | | camera | 69 | 527911 | 6415775 | 527936 | 6415791 | -26 | -16 | 31 | 57 | PL | (Corr'd Nav, Kongsberg 14208, img#30) (B) (T.A) |
| 06-Apr-2023 | 02:52:46 | 1770 | ECR_ENV_06 | | | camera | 69 | 527910 | 6415773 | 527936 | 6415791 | -27 | -18 | 32 | 56 | PL | (Corr'd Nav, Kongsberg 14208, img#31) (B) (T.A) |
| 06-Apr-2023 | 02:52:55 | 1771 | ECR_ENV_06 | | | camera | 69 | 527910 | 6415772 | 527936 | 6415791 | -26 | -19 | 32 | 54 | PL | (Corr'd Nav, Kongsberg 14208, img#32) (B) (T.A) |
| 06-Apr-2023 | 02:53:02 | 1772 | ECR_ENV_06 | | | camera | 69 | 527910 | 6415772 | 527936 | 6415791 | -26 | -19 | 33 | 54 | PL | (Corr'd Nav, Kongsberg 14208, img#33) (B) (T.A) |
| 06-Apr-2023 | 02:53:11 | 1773 | ECR_ENV_06 | | | camera | 69 | 527908 | 6415772 | 527936 | 6415791 | -28 | -19 | 34 | 56 | PL | (Corr'd Nav, Kongsberg 14208, img#34) (B) (T.A) |
| 06-Apr-2023 | 02:53:17 | 1774 | ECR_ENV_06 | | | camera | 69 | 527906 | 6415770 | 527936 | 6415791 | -30 | -21 | 37 | 55 | PL | (Corr'd Nav, Kongsberg 14208, img#35) (B) (T.A) |
| 06-Apr-2023 | 02:53:41 | 1775 | ECR_ENV_06 | | | camera | 69 | 527899 | 6415765 | 527936 | 6415791 | -37 | -26 | 45 | 55 | PL | (Corr'd Nav, Kongsberg 14208, img#36) (B) (T.A) |
| 06-Apr-2023 | 02:53:45 | 1776 | ECR_ENV_06 | | | camera | 69 | 527900 | 6415766 | 527936 | 6415791 | -36 | -25 | 44 | 55 | PL | (Corr'd Nav, Kongsberg 14208, img#37) (B) (T.A) |
| 06-Apr-2023 | 02:53:52 | 1777 | ECR_ENV_06 | | | camera | 69 | 527900 | 6415766 | 527936 | 6415791 | -36 | -25 | 44 | 55 | PL | (Corr'd Nav, Kongsberg 14208, img#38) (B) (T.A) |
| 06-Apr-2023 | 02:54:14 | 1778 | ECR_ENV_06 | | | camera | 69 | 527900 | 6415766 | 527936 | 6415791 | -37 | -26 | 45 | 55 | PL | (Corr'd Nav, Kongsberg 14208, img#39) (B) (T.A) |
| 06-Apr-2023 | 02:54:58 | 1779 | ECR_ENV_06 | | | camera | 69 | 527899 | 6415765 | 527936 | 6415791 | -37 | -26 | 45 | 55 | PL | (Corr'd Nav, Kongsberg 14208, img#40) (B) (T.A) |
| 06-Apr-2023 | 02:55:11 | 1780 | ECR_ENV_06 | | | camera | 69 | 527899 | 6415765 | 527936 | 6415791 | -37 | -26 | 46 | 55 | PL | (Corr'd Nav, Kongsberg 14208, img#41) (B) (T.A) |
| 06-Apr-2023 | 02:56:26 | 1781 | ECR_ENV_06 | | | camera | 69 | 527898 | 6415764 | 527936 | 6415791 | -39 | -27 | 47 | 55 | PL | (Corr'd Nav, Kongsberg 14208, img#42) (B) (T.A) |
| 06-Apr-2023 | 06:31:28 | 1782 | ECR_ENV_13 | | | camera | 62 | 525841 | 6415939 | 525888 | 6415996 | -47 | -58 | 75 | 39 | PL | (Corr'd Nav, Kongsberg 14208, img#1) (B) (T.A) |
| 06-Apr-2023 | 06:32:22 | 1783 | ECR_ENV_13 | | | camera | 62 | 525846 | 6415938 | 525888 | 6415996 | -43 | -58 | 72 | 36 | PL | (Corr'd Nav, Kongsberg 14208, img#2) (B) (T.A) |
| 06-Apr-2023 | 06:32:47 | 1784 | ECR_ENV_13 | | | camera | 62 | 525847 | 6415947 | 525888 | 6415996 | -42 | -49 | 64 | 40 | PL | (Corr'd Nav, Kongsberg 14208, img#3) (B) (T.A) |
| 06-Apr-2023 | 06:32:53 | 1785 | ECR_ENV_13 | | | camera | 62 | 525849 | 6415946 | 525888 | 6415996 | -40 | -50 | 64 | 38 | PL | (Corr'd Nav, Kongsberg 14208, img#4) (B) (T.A) |
| 06-Apr-2023 | 06:32:59 | 1786 | ECR_ENV_13 | | | camera | 62 | 525849 | 6415947 | 525888 | 6415996 | -40 | -49 | 63 | 39 | PL | (Corr'd Nav, Kongsberg 14208, img#5) (B) (T.A) |
| 06-Apr-2023 | 06:33:36 | 1787 | ECR_ENV_13 | | | camera | 62 | 525853 | 6415954 | 525888 | 6415996 | -36 | -43 | 55 | 40 | PL | (Corr'd Nav, Kongsberg 14208, img#6) (B) (T.A) |
| 06-Apr-2023 | 06:34:00 | 1788 | ECR_ENV_13 | | | camera | 62 | 525859 | 6415955 | 525888 | 6415996 | -29 | -42 | 51 | 35 | PL | (Corr'd Nav, Kongsberg 14208, img#7) (B) (T.A) |
| 06-Apr-2023 | 06:34:13 | 1789 | ECR_ENV_13 | | | camera | 62 | 525857 | 6415960 | 525888 | 6415996 | -32 | -36 | 48 | 42 | PL | (Corr'd Nav, Kongsberg 14208, img#8) (B) (T.A) |
| 06-Apr-2023 | 06:34:31 | 1790 | ECR_ENV_13 | | | camera | 62 | 525858 | 6415962 | 525888 | 6415996 | -30 | -34 | 46 | 41 | PL | (Corr'd Nav, Kongsberg 14208, img#9) (B) (T.A) |
| 06-Apr-2023 | 06:34:50 | 1791 | ECR_ENV_13 | | | camera | 62 | 525858 | 6415966 | 525888 | 6415996 | -31 | -30 | 43 | 45 | PL | (Corr'd Nav, Kongsberg 14208, img#10) (B) (T.A) |
| 06-Apr-2023 | 06:35:00 | 1792 | ECR_ENV_13 | | | camera | 62 | 525858 | 6415969 | 525888 | 6415996 | -30 | -28 | 41 | 47 | PL | (Corr'd Nav, Kongsberg 14208, img#11) (B) (T.A) |
| 06-Apr-2023 | 06:35:13 | 1793 | ECR_ENV_13 | | | camera | 62 | 525860 | 6415969 | 525888 | 6415996 | -28 | -28 | 40 | 46 | PL | (Corr'd Nav, Kongsberg 14208, img#12) (B) (T.A) |
| 06-Apr-2023 | 06:35:26 | 1794 | ECR_ENV_13 | | | camera | 62 | 525860 | 6415970 | 525888 | 6415996 | -29 | -26 | 39 | 47 | PL | (Corr'd Nav, Kongsberg 14208, img#13) (B) (T.A) |
| 06-Apr-2023 | 06:36:11 | 1795 | ECR_ENV_13 | | | camera | 62 | 525864 | 6415978 | 525888 | 6415996 | -25 | -18 | 31 | 53 | PL | (Corr'd Nav, Kongsberg 14208, img#14) (B) (T.A) |
| 06-Apr-2023 | 06:36:17 | 1796 | ECR_ENV_13 | | | camera | 62 | 525866 | 6415980 | 525888 | 6415996 | -23 | -16 | 28 | 54 | PL | (Corr'd Nav, Kongsberg 14208, img#15) (B) (T.A) |
| 06-Apr-2023 | 06:36:24 | 1797 | ECR_ENV_13 | | | camera | 62 | 525864 | 6415982 | 525888 | 6415996 | -24 | -15 | 28 | 59 | PL | (Corr'd Nav, Kongsberg 14208, img#16) (B) (T.A) |
| 06-Apr-2023 | 06:36:51 | 1798 | ECR_ENV_13 | | | camera | 62 | 525869 | 6415985 | 525888 | 6415996 | -20 | -12 | 23 | 60 | PL | (Corr'd Nav, Kongsberg 14208, img#17) (B) (T.A) |
| 06-Apr-2023 | 06:37:02 | 1799 | ECR_ENV_13 | | | camera | 62 | 525870 | 6415985 | 525888 | 6415996 | -18 | -11 | 21 | 59 | PL | (Corr'd Nav, Kongsberg 14208, img#18) (B) (T.A) |
| 06-Apr-2023 | 06:37:08 | 1800 | ECR_ENV_13 | | | camera | 62 | 525870 | 6415987 | 525888 | 6415996 | -18 | -9 | 20 | 63 | PL | (Corr'd Nav, Kongsberg 14208, img#19) (B) (T.A) |
| 06-Apr-2023 | 06:37:15 | 1801 | ECR_ENV_13 | | | camera | 62 | 525872 | 6415987 | 525888 | 6415996 | -16 | -9 | 18 | 61 | PL | (Corr'd Nav, Kongsberg 14208, img#20) (B) (T.A) |
| 06-Apr-2023 | 06:37:23 | 1802 | ECR_ENV_13 | | | camera | 62 | 525872 | 6415988 | 525888 | 6415996 | -16 | -9 | 18 | 62 | PL | (Corr'd Nav, Kongsberg 14208, img#21) (B) (T.A) |
| 06-Apr-2023 | 06:37:31 | 1803 | ECR_ENV_13 | | | camera | 62 | 525874 | 6415989 | 525888 | 6415996 | -14 | -8 | 16 | 61 | PL | (Corr'd Nav, Kongsberg 14208, img#22) (B) (T.A) |
| 06-Apr-2023 | 06:38:10 | 1804 | ECR_ENV_13 | | | camera | 62 | 525879 | 6415992 | 525888 | 6415996 | -10 | -5 | 11 | 64 | PL | (Corr'd Nav, Kongsberg 14208, img#23) (B) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 | |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 06-Apr-2023 | 06:38:31 | 1805 | ECR_ENV_13 | | | camera | 62 | 525878 | 6415994 | 525888 | 6415996 | -10 | -3 | 10 | 75 | PL | (Corr'd Nav, Kongsberg 14208, img#24) (B) (T.A) |
| 06-Apr-2023 | 06:38:40 | 1806 | ECR_ENV_13 | | | camera | 62 | 525881 | 6415993 | 525888 | 6415996 | -7 | -4 | 8 | 62 | PL | (Corr'd Nav, Kongsberg 14208, img#25) (B) (T.A) |
| 06-Apr-2023 | 06:38:54 | 1807 | ECR_ENV_13 | | | camera | 62 | 525882 | 6415997 | 525888 | 6415996 | -6 | 1 | 6 | 97 | PL | (Corr'd Nav, Kongsberg 14208, img#26) (B) (T.A) |
| 06-Apr-2023 | 06:39:02 | 1808 | ECR_ENV_13 | | | camera | 62 | 525883 | 6415997 | 525888 | 6415996 | -5 | 1 | 5 | 100 | PL | (Corr'd Nav, Kongsberg 14208, img#27) (B) (T.A) |
| 06-Apr-2023 | 06:39:18 | 1809 | ECR_ENV_13 | | | camera | 62 | 525886 | 6415999 | 525888 | 6415996 | -2 | 3 | 4 | 142 | PL | (Corr'd Nav, Kongsberg 14208, img#28) (B) (T.A) |
| 06-Apr-2023 | 06:39:27 | 1810 | ECR_ENV_13 | | | camera | 62 | 525887 | 6415999 | 525888 | 6415996 | -1 | 3 | 3 | 156 | PL | (Corr'd Nav, Kongsberg 14208, img#29) (B) (T.A) |
| 06-Apr-2023 | 06:40:09 | 1811 | ECR_ENV_13 | | | camera | 62 | 525891 | 6416006 | 525888 | 6415996 | 3 | 9 | 10 | -163 | PL | (Corr'd Nav, Kongsberg 14208, img#30) (B) (T.A) |
| 06-Apr-2023 | 06:40:26 | 1812 | ECR_ENV_13 | | | camera | 62 | 525892 | 6416009 | 525888 | 6415996 | 4 | 13 | 14 | -163 | PL | (Corr'd Nav, Kongsberg 14208, img#31) (B) (T.A) |
| 06-Apr-2023 | 06:40:47 | 1813 | ECR_ENV_13 | | | camera | 62 | 525896 | 6416011 | 525888 | 6415996 | 8 | 15 | 17 | -151 | PL | (Corr'd Nav, Kongsberg 14208, img#32) (B) (T.A) |
| 06-Apr-2023 | 06:41:00 | 1814 | ECR_ENV_13 | | | camera | 62 | 525899 | 6416011 | 525888 | 6415996 | 10 | 15 | 18 | -145 | PL | (Corr'd Nav, Kongsberg 14208, img#33) (B) (T.A) |
| 06-Apr-2023 | 06:41:46 | 1815 | ECR_ENV_13 | | | camera | 62 | 525906 | 6416013 | 525888 | 6415996 | 17 | 17 | 24 | -134 | PL | (Corr'd Nav, Kongsberg 14208, img#34) (B) (T.A) |
| 06-Apr-2023 | 06:42:02 | 1816 | ECR_ENV_13 | | | camera | 62 | 525908 | 6416014 | 525888 | 6415996 | 20 | 18 | 27 | -133 | PL | (Corr'd Nav, Kongsberg 14208, img#35) (B) (T.A) |
| 06-Apr-2023 | 06:42:25 | 1817 | ECR_ENV_13 | | | camera | 61 | 525912 | 6416017 | 525888 | 6415996 | 24 | 21 | 32 | -131 | PL | (Corr'd Nav, Kongsberg 14208, img#36) (B) (T.A) |
| 06-Apr-2023 | 06:42:33 | 1818 | ECR_ENV_13 | | | camera | 61 | 525913 | 6416018 | 525888 | 6415996 | 25 | 21 | 33 | -131 | PL | (Corr'd Nav, Kongsberg 14208, img#37) (B) (T.A) |
| 06-Apr-2023 | 06:42:40 | 1819 | ECR_ENV_13 | | | camera | 62 | 525914 | 6416019 | 525888 | 6415996 | 26 | 22 | 34 | -131 | PL | (Corr'd Nav, Kongsberg 14208, img#38) (B) (T.A) |
| 06-Apr-2023 | 06:43:09 | 1820 | ECR_ENV_13 | | | camera | 61 | 525920 | 6416027 | 525888 | 6415996 | 32 | 31 | 44 | -134 | PL | (Corr'd Nav, Kongsberg 14208, img#39) (B) (T.A) |
| 06-Apr-2023 | 06:43:25 | 1821 | ECR_ENV_13 | | | camera | 61 | 525922 | 6416029 | 525888 | 6415996 | 34 | 33 | 47 | -134 | PL | (Corr'd Nav, Kongsberg 14208, img#40) (B) (T.A) |
| 06-Apr-2023 | 09:04:49 | 1822 | ECR_ENV_32 | | | camera | 58 | 525170 | 6418383 | 525129 | 6418432 | 41 | -49 | 64 | -40 | PL | (Corr'd Nav, Kongsberg 14208, img#1) (B) (T.A) |
| 06-Apr-2023 | 09:05:25 | 1823 | ECR_ENV_32 | | | camera | 58 | 525176 | 6418386 | 525129 | 6418432 | 48 | -46 | 66 | -46 | PL | (Corr'd Nav, Kongsberg 14208, img#2) (B) (T.A) |
| 06-Apr-2023 | 09:05:33 | 1824 | ECR_ENV_32 | | | camera | 58 | 525188 | 6418390 | 525129 | 6418432 | 59 | -42 | 73 | -55 | PL | (Corr'd Nav, Kongsberg 14208, img#3) (B) (T.A) |
| 06-Apr-2023 | 09:05:57 | 1825 | ECR_ENV_32 | | | camera | 58 | 525170 | 6418386 | 525129 | 6418432 | 42 | -46 | 62 | -42 | PL | (Corr'd Nav, Kongsberg 14208, img#4) (B) (T.A) |
| 06-Apr-2023 | 09:06:11 | 1826 | ECR_ENV_32 | | | camera | 58 | 525170 | 6418387 | 525129 | 6418432 | 41 | -45 | 61 | -42 | PL | (Corr'd Nav, Kongsberg 14208, img#5) (B) (T.A) |
| 06-Apr-2023 | 09:06:25 | 1827 | ECR_ENV_32 | | | camera | 58 | 525168 | 6418390 | 525129 | 6418432 | 40 | -43 | 58 | -43 | PL | (Corr'd Nav, Kongsberg 14208, img#6) (B) (T.A) |
| 06-Apr-2023 | 09:06:37 | 1828 | ECR_ENV_32 | | | camera | 58 | 525168 | 6418390 | 525129 | 6418432 | 39 | -42 | 58 | -43 | PL | (Corr'd Nav, Kongsberg 14208, img#7) (B) (T.A) |
| 06-Apr-2023 | 09:06:54 | 1829 | ECR_ENV_32 | | | camera | 58 | 525169 | 6418391 | 525129 | 6418432 | 40 | -41 | 57 | -44 | PL | (Corr'd Nav, Kongsberg 14208, img#8) (B) (T.A) |
| 06-Apr-2023 | 09:07:04 | 1830 | ECR_ENV_32 | | | camera | 58 | 525167 | 6418393 | 525129 | 6418432 | 38 | -39 | 55 | -44 | PL | (Corr'd Nav, Kongsberg 14208, img#9) (B) (T.A) |
| 06-Apr-2023 | 09:07:34 | 1831 | ECR_ENV_32 | | | camera | 58 | 525163 | 6418396 | 525129 | 6418432 | 35 | -36 | 50 | -44 | PL | (Corr'd Nav, Kongsberg 14208, img#10) (B) (T.A) |
| 06-Apr-2023 | 09:08:24 | 1832 | ECR_ENV_32 | | | camera | 58 | 525156 | 6418401 | 525129 | 6418432 | 27 | -31 | 41 | -41 | PL | (Corr'd Nav, Kongsberg 14208, img#11) (B) (T.A) |
| 06-Apr-2023 | 09:08:33 | 1833 | ECR_ENV_32 | | | camera | 58 | 525155 | 6418403 | 525129 | 6418432 | 26 | -29 | 39 | -42 | PL | (Corr'd Nav, Kongsberg 14208, img#12) (B) (T.A) |
| 06-Apr-2023 | 09:08:45 | 1834 | ECR_ENV_32 | | | camera | 58 | 525153 | 6418403 | 525129 | 6418432 | 24 | -29 | 38 | -40 | PL | (Corr'd Nav, Kongsberg 14208, img#13) (B) (T.A) |
| 06-Apr-2023 | 09:09:04 | 1835 | ECR_ENV_32 | | | camera | 58 | 525151 | 6418405 | 525129 | 6418432 | 22 | -28 | 35 | -39 | PL | (Corr'd Nav, Kongsberg 14208, img#14) (B) (T.A) |
| 06-Apr-2023 | 09:09:13 | 1836 | ECR_ENV_32 | | | camera | 58 | 525150 | 6418406 | 525129 | 6418432 | 21 | -27 | 34 | -38 | PL | (Corr'd Nav, Kongsberg 14208, img#15) (B) (T.A) |
| 06-Apr-2023 | 09:09:28 | 1837 | ECR_ENV_32 | | | camera | 58 | 525149 | 6418406 | 525129 | 6418432 | 21 | -27 | 34 | -38 | PL | (Corr'd Nav, Kongsberg 14208, img#16) (B) (T.A) |
| 06-Apr-2023 | 09:09:54 | 1838 | ECR_ENV_32 | | | camera | 58 | 525148 | 6418409 | 525129 | 6418432 | 19 | -24 | 30 | -39 | PL | (Corr'd Nav, Kongsberg 14208, img#17) (B) (T.A) |
| 06-Apr-2023 | 09:10:26 | 1839 | ECR_ENV_32 | | | camera | 58 | 525147 | 6418410 | 525129 | 6418432 | 19 | -23 | 29 | -40 | PL | (Corr'd Nav, Kongsberg 14208, img#18) (B) (T.A) |
| 06-Apr-2023 | 09:10:37 | 1840 | ECR_ENV_32 | | | camera | 58 | 525147 | 6418412 | 525129 | 6418432 | 19 | -21 | 28 | -42 | PL | (Corr'd Nav, Kongsberg 14208, img#19) (B) (T.A) |
| 06-Apr-2023 | 09:10:46 | 1841 | ECR_ENV_32 | | | camera | 59 | 525147 | 6418413 | 525129 | 6418432 | 18 | -20 | 27 | -43 | PL | (Corr'd Nav, Kongsberg 14208, img#20) (B) (T.A) |
| 06-Apr-2023 | 09:10:55 | 1842 | ECR_ENV_32 | | | camera | 59 | 525148 | 6418413 | 525129 | 6418432 | 19 | -19 | 27 | -45 | PL | (Corr'd Nav, Kongsberg 14208, img#21) (B) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | | Vertical / Tidal Datum | VORF, LAT | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 06-Apr-2023 | 09:11:07 | 1843 | ECR_ENV_32 | | | camera | 59 | 525146 | 6418414 | 525129 | 6418432 | 17 | -19 | 26 | -43 | PL | (Corr'd Nav, Kongsberg 14208, img#22) (B) (T.A) |
| 06-Apr-2023 | 09:11:39 | 1844 | ECR_ENV_32 | | | camera | 59 | 525146 | 6418417 | 525129 | 6418432 | 18 | -16 | 24 | -48 | PL | (Corr'd Nav, Kongsberg 14208, img#23) (B) (T.A) |
| 06-Apr-2023 | 09:11:46 | 1845 | ECR_ENV_32 | | | camera | 59 | 525147 | 6418418 | 525129 | 6418432 | 19 | -15 | 24 | -51 | PL | (Corr'd Nav, Kongsberg 14208, img#24) (B) (T.A) |
| 06-Apr-2023 | 09:11:52 | 1846 | ECR_ENV_32 | | | camera | 59 | 525146 | 6418417 | 525129 | 6418432 | 17 | -15 | 23 | -48 | PL | (Corr'd Nav, Kongsberg 14208, img#25) (B) (T.A) |
| 06-Apr-2023 | 09:12:07 | 1847 | ECR_ENV_32 | | | camera | 59 | 525144 | 6418419 | 525129 | 6418432 | 15 | -13 | 20 | -49 | PL | (Corr'd Nav, Kongsberg 14208, img#26) (B) (T.A) |
| 06-Apr-2023 | 09:12:38 | 1848 | ECR_ENV_32 | | | camera | 59 | 525140 | 6418422 | 525129 | 6418432 | 12 | -10 | 15 | -49 | PL | (Corr'd Nav, Kongsberg 14208, img#27) (B) (T.A) |
| 06-Apr-2023 | 09:13:12 | 1849 | ECR_ENV_32 | | | camera | 59 | 525137 | 6418423 | 525129 | 6418432 | 8 | -9 | 12 | -41 | PL | (Corr'd Nav, Kongsberg 14208, img#28) (B) (T.A) |
| 06-Apr-2023 | 09:13:30 | 1850 | ECR_ENV_32 | | | camera | 59 | 525136 | 6418425 | 525129 | 6418432 | 7 | -8 | 11 | -45 | PL | (Corr'd Nav, Kongsberg 14208, img#29) (B) (T.A) |
| 06-Apr-2023 | 09:14:22 | 1851 | ECR_ENV_32 | | | camera | 59 | 525135 | 6418427 | 525129 | 6418432 | 6 | -5 | 8 | -50 | PL | (Corr'd Nav, Kongsberg 14208, img#30) (B) (T.A) |
| 06-Apr-2023 | 09:14:31 | 1852 | ECR_ENV_32 | | | camera | 59 | 525135 | 6418428 | 525129 | 6418432 | 6 | -4 | 8 | -54 | PL | (Corr'd Nav, Kongsberg 14208, img#31) (B) (T.A) |
| 06-Apr-2023 | 09:14:53 | 1853 | ECR_ENV_32 | | | camera | 59 | 525134 | 6418430 | 525129 | 6418432 | 5 | -2 | 6 | -66 | PL | (Corr'd Nav, Kongsberg 14208, img#32) (B) (T.A) |
| 06-Apr-2023 | 09:15:55 | 1854 | ECR_ENV_32 | | | camera | 59 | 525129 | 6418434 | 525129 | 6418432 | 0 | 2 | 2 | -176 | PL | (Corr'd Nav, Kongsberg 14208, img#33) (B) (T.A) |
| 06-Apr-2023 | 09:16:11 | 1855 | ECR_ENV_32 | | | camera | 59 | 525127 | 6418434 | 525129 | 6418432 | -1 | 2 | 2 | 148 | PL | (Corr'd Nav, Kongsberg 14208, img#34) (B) (T.A) |
| 06-Apr-2023 | 09:16:45 | 1856 | ECR_ENV_32 | | | camera | 59 | 525124 | 6418437 | 525129 | 6418432 | -4 | 4 | 6 | 134 | PL | (Corr'd Nav, Kongsberg 14208, img#35) (B) (T.A) |
| 06-Apr-2023 | 09:16:58 | 1857 | ECR_ENV_32 | | | camera | 59 | 525123 | 6418438 | 525129 | 6418432 | -6 | 5 | 8 | 132 | PL | (Corr'd Nav, Kongsberg 14208, img#36) (B) (T.A) |
| 06-Apr-2023 | 09:17:22 | 1858 | ECR_ENV_32 | | | camera | 59 | 525120 | 6418438 | 525129 | 6418432 | -9 | 5 | 11 | 121 | PL | (Corr'd Nav, Kongsberg 14208, img#37) (B) (T.A) |
| 06-Apr-2023 | 09:17:53 | 1859 | ECR_ENV_32 | | | camera | 59 | 525119 | 6418439 | 525129 | 6418432 | -9 | 6 | 11 | 124 | PL | (Corr'd Nav, Kongsberg 14208, img#38) (B) (T.A) |
| 06-Apr-2023 | 09:18:23 | 1860 | ECR_ENV_32 | | | camera | 59 | 525118 | 6418442 | 525129 | 6418432 | -11 | 10 | 14 | 132 | PL | (Corr'd Nav, Kongsberg 14208, img#39) (B) (T.A) |
| 06-Apr-2023 | 09:18:54 | 1861 | ECR_ENV_32 | | | camera | 59 | 525116 | 6418443 | 525129 | 6418432 | -13 | 11 | 17 | 130 | PL | (Corr'd Nav, Kongsberg 14208, img#40) (B) (T.A) |
| 06-Apr-2023 | 09:19:01 | 1862 | ECR_ENV_32 | | | camera | 59 | 525116 | 6418443 | 525129 | 6418432 | -13 | 11 | 17 | 131 | PL | (Corr'd Nav, Kongsberg 14208, img#41) (B) (T.A) |
| 06-Apr-2023 | 09:19:08 | 1863 | ECR_ENV_32 | | | camera | 59 | 525117 | 6418443 | 525129 | 6418432 | -12 | 11 | 16 | 132 | PL | (Corr'd Nav, Kongsberg 14208, img#42) (B) (T.A) |
| 06-Apr-2023 | 09:19:54 | 1864 | ECR_ENV_32 | | | camera | 59 | 525113 | 6418448 | 525129 | 6418432 | -16 | 15 | 22 | 134 | PL | (Corr'd Nav, Kongsberg 14208, img#43) (B) (T.A) |
| 06-Apr-2023 | 09:20:02 | 1865 | ECR_ENV_32 | | | camera | 59 | 525113 | 6418448 | 525129 | 6418432 | -16 | 16 | 23 | 134 | PL | (Corr'd Nav, Kongsberg 14208, img#44) (B) (T.A) |
| 06-Apr-2023 | 09:20:38 | 1866 | ECR_ENV_32 | | | camera | 59 | 525108 | 6418451 | 525129 | 6418432 | -21 | 18 | 28 | 132 | PL | (Corr'd Nav, Kongsberg 14208, img#45) (B) (T.A) |
| 06-Apr-2023 | 09:21:15 | 1867 | ECR_ENV_32 | | | camera | 59 | 525107 | 6418454 | 525129 | 6418432 | -22 | 22 | 31 | 135 | PL | (Corr'd Nav, Kongsberg 14208, img#46) (B) (T.A) |
| 06-Apr-2023 | 09:21:22 | 1868 | ECR_ENV_32 | | | camera | 59 | 525106 | 6418456 | 525129 | 6418432 | -23 | 24 | 33 | 136 | PL | (Corr'd Nav, Kongsberg 14208, img#47) (B) (T.A) |
| 06-Apr-2023 | 09:21:50 | 1869 | ECR_ENV_32 | | | camera | 60 | 525105 | 6418459 | 525129 | 6418432 | -24 | 26 | 35 | 137 | PL | (Corr'd Nav, Kongsberg 14208, img#48) (B) (T.A) |
| 06-Apr-2023 | 09:22:35 | 1870 | ECR_ENV_32 | | | camera | 60 | 525099 | 6418461 | 525129 | 6418432 | -29 | 28 | 41 | 134 | PL | (Corr'd Nav, Kongsberg 14208, img#49) (B) (T.A) |
| 06-Apr-2023 | 09:23:03 | 1871 | ECR_ENV_32 | | | camera | 60 | 525098 | 6418461 | 525129 | 6418432 | -31 | 29 | 42 | 134 | PL | (Corr'd Nav, Kongsberg 14208, img#50) (B) (T.A) |
| 06-Apr-2023 | 09:24:15 | 1872 | ECR_ENV_32 | | | camera | 60 | 525094 | 6418464 | 525129 | 6418432 | -35 | 32 | 47 | 132 | PL | (Corr'd Nav, Kongsberg 14208, img#51) (B) (T.A) |
| 06-Apr-2023 | 09:24:54 | 1873 | ECR_ENV_32 | | | camera | 60 | 525091 | 6418464 | 525129 | 6418432 | -37 | 31 | 49 | 130 | PL | (Corr'd Nav, Kongsberg 14208, img#52) (B) (T.A) |
| 06-Apr-2023 | 11:38:08 | 1874 | ECR_ENV_11 | | | camera | 65 | 527443 | 6419304 | 527403 | 6419346 | 40 | -42 | 58 | -44 | PL | (Corr'd Nav, Kongsberg 14208, img#1) (B) (T.A) |
| 06-Apr-2023 | 11:38:23 | 1875 | ECR_ENV_11 | | | camera | 65 | 527443 | 6419304 | 527403 | 6419346 | 40 | -43 | 58 | -43 | PL | (Corr'd Nav, Kongsberg 14208, img#2) (B) (T.A) |
| 06-Apr-2023 | 11:38:33 | 1876 | ECR_ENV_11 | | | camera | 65 | 527441 | 6419304 | 527403 | 6419346 | 38 | -43 | 57 | -42 | PL | (Corr'd Nav, Kongsberg 14208, img#3) (B) (T.A) |
| 06-Apr-2023 | 11:38:44 | 1877 | ECR_ENV_11 | | | camera | 65 | 527441 | 6419303 | 527403 | 6419346 | 38 | -43 | 57 | -42 | PL | (Corr'd Nav, Kongsberg 14208, img#4) (B) (T.A) |
| 06-Apr-2023 | 11:38:53 | 1878 | ECR_ENV_11 | | | camera | 65 | 527439 | 6419304 | 527403 | 6419346 | 37 | -42 | 56 | -41 | PL | (Corr'd Nav, Kongsberg 14208, img#5) (B) (T.A) |
| 06-Apr-2023 | 11:39:29 | 1879 | ECR_ENV_11 | | | camera | 65 | 527444 | 6419307 | 527403 | 6419346 | 41 | -39 | 57 | -46 | PL | (Corr'd Nav, Kongsberg 14208, img#6) (B) (T.A) |
| 06-Apr-2023 | 11:39:51 | 1880 | ECR_ENV_11 | | | camera | 65 | 527440 | 6419309 | 527403 | 6419346 | 37 | -37 | 52 | -46 | PL | (Corr'd Nav, Kongsberg 14208, img#7) (B) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | | Vertical / Tidal Datum | VORF, LAT | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 06-Apr-2023 | 11:40:01 | 1881 | ECR_ENV_11 | | | camera | 65 | 527438 | 6419311 | 527403 | 6419346 | 35 | -35 | 50 | -45 | PL | (Corr'd Nav, Kongsberg 14208, img#8) (B) (T.A) |
| 06-Apr-2023 | 11:40:30 | 1882 | ECR_ENV_11 | | | camera | 65 | 527436 | 6419315 | 527403 | 6419346 | 33 | -31 | 45 | -47 | PL | (Corr'd Nav, Kongsberg 14208, img#9) (B) (T.A) |
| 06-Apr-2023 | 11:40:46 | 1883 | ECR_ENV_11 | | | camera | 65 | 527434 | 6419318 | 527403 | 6419346 | 31 | -28 | 42 | -48 | PL | (Corr'd Nav, Kongsberg 14208, img#10) (B) (T.A) |
| 06-Apr-2023 | 11:41:08 | 1884 | ECR_ENV_11 | | | camera | 65 | 527431 | 6419319 | 527403 | 6419346 | 28 | -27 | 39 | -46 | PL | (Corr'd Nav, Kongsberg 14208, img#11) (B) (T.A) |
| 06-Apr-2023 | 11:41:29 | 1885 | ECR_ENV_11 | | | camera | 65 | 527429 | 6419323 | 527403 | 6419346 | 27 | -24 | 36 | -49 | PL | (Corr'd Nav, Kongsberg 14208, img#12) (B) (T.A) |
| 06-Apr-2023 | 11:41:37 | 1886 | ECR_ENV_11 | | | camera | 65 | 527428 | 6419326 | 527403 | 6419346 | 26 | -20 | 33 | -52 | PL | (Corr'd Nav, Kongsberg 14208, img#13) (B) (T.A) |
| 06-Apr-2023 | 11:41:56 | 1887 | ECR_ENV_11 | | | camera | 65 | 527425 | 6419328 | 527403 | 6419346 | 22 | -18 | 29 | -51 | PL | (Corr'd Nav, Kongsberg 14208, img#14) (B) (T.A) |
| 06-Apr-2023 | 11:42:10 | 1888 | ECR_ENV_11 | | | camera | 65 | 527423 | 6419330 | 527403 | 6419346 | 20 | -16 | 26 | -52 | PL | (Corr'd Nav, Kongsberg 14208, img#15) (B) (T.A) |
| 06-Apr-2023 | 11:42:37 | 1889 | ECR_ENV_11 | | | camera | 65 | 527419 | 6419332 | 527403 | 6419346 | 16 | -14 | 21 | -49 | PL | (Corr'd Nav, Kongsberg 14208, img#16) (B) (T.A) |
| 06-Apr-2023 | 11:43:03 | 1890 | ECR_ENV_11 | | | camera | 65 | 527416 | 6419336 | 527403 | 6419346 | 13 | -11 | 17 | -52 | PL | (Corr'd Nav, Kongsberg 14208, img#17) (B) (T.A) |
| 06-Apr-2023 | 11:43:10 | 1891 | ECR_ENV_11 | | | camera | 65 | 527415 | 6419337 | 527403 | 6419346 | 12 | -9 | 16 | -53 | PL | (Corr'd Nav, Kongsberg 14208, img#18) (B) (T.A) |
| 06-Apr-2023 | 11:43:41 | 1892 | ECR_ENV_11 | | | camera | 65 | 527412 | 6419340 | 527403 | 6419346 | 10 | -6 | 11 | -57 | PL | (Corr'd Nav, Kongsberg 14208, img#19) (B) (T.A) |
| 06-Apr-2023 | 11:44:00 | 1893 | ECR_ENV_11 | | | camera | 65 | 527411 | 6419342 | 527403 | 6419346 | 8 | -4 | 9 | -61 | PL | (Corr'd Nav, Kongsberg 14208, img#20) (B) (T.A) |
| 06-Apr-2023 | 11:44:24 | 1894 | ECR_ENV_11 | | | camera | 65 | 527409 | 6419344 | 527403 | 6419346 | 6 | -2 | 7 | -70 | PL | (Corr'd Nav, Kongsberg 14208, img#21) (B) (T.A) |
| 06-Apr-2023 | 11:44:40 | 1895 | ECR_ENV_11 | | | camera | 65 | 527408 | 6419345 | 527403 | 6419346 | 6 | -1 | 6 | -76 | PL | (Corr'd Nav, Kongsberg 14208, img#22) (B) (T.A) |
| 06-Apr-2023 | 11:44:53 | 1896 | ECR_ENV_11 | | | camera | 65 | 527403 | 6419347 | 527403 | 6419346 | 1 | 1 | 1 | -139 | PL | (Corr'd Nav, Kongsberg 14208, img#23) (B) (T.A) |
| 06-Apr-2023 | 11:45:06 | 1897 | ECR_ENV_11 | | | camera | 65 | 527402 | 6419349 | 527403 | 6419346 | -1 | 3 | 3 | 162 | PL | (Corr'd Nav, Kongsberg 14208, img#24) (B) (T.A) |
| 06-Apr-2023 | 11:45:20 | 1898 | ECR_ENV_11 | | | camera | 65 | 527401 | 6419350 | 527403 | 6419346 | -2 | 4 | 4 | 158 | PL | (Corr'd Nav, Kongsberg 14208, img#25) (B) (T.A) |
| 06-Apr-2023 | 11:45:32 | 1899 | ECR_ENV_11 | | | camera | 65 | 527399 | 6419353 | 527403 | 6419346 | -4 | 7 | 8 | 151 | PL | (Corr'd Nav, Kongsberg 14208, img#26) (B) (T.A) |
| 06-Apr-2023 | 11:45:48 | 1900 | ECR_ENV_11 | | | camera | 65 | 527397 | 6419357 | 527403 | 6419346 | -6 | 11 | 12 | 151 | PL | (Corr'd Nav, Kongsberg 14208, img#27) (B) (T.A) |
| 06-Apr-2023 | 11:46:03 | 1901 | ECR_ENV_11 | | | camera | 65 | 527398 | 6419358 | 527403 | 6419346 | -5 | 12 | 13 | 157 | PL | (Corr'd Nav, Kongsberg 14208, img#28) (B) (T.A) |
| 06-Apr-2023 | 11:46:21 | 1902 | ECR_ENV_11 | | | camera | 65 | 527393 | 6419359 | 527403 | 6419346 | -10 | 13 | 16 | 143 | PL | (Corr'd Nav, Kongsberg 14208, img#29) (B) (T.A) |
| 06-Apr-2023 | 11:46:33 | 1903 | ECR_ENV_11 | | | camera | 65 | 527393 | 6419360 | 527403 | 6419346 | -10 | 14 | 17 | 144 | PL | (Corr'd Nav, Kongsberg 14208, img#30) (B) (T.A) |
| 06-Apr-2023 | 11:46:45 | 1904 | ECR_ENV_11 | | | camera | 65 | 527388 | 6419362 | 527403 | 6419346 | -14 | 16 | 21 | 138 | PL | (Corr'd Nav, Kongsberg 14208, img#31) (B) (T.A) |
| 06-Apr-2023 | 11:46:55 | 1905 | ECR_ENV_11 | | | camera | 65 | 527391 | 6419363 | 527403 | 6419346 | -12 | 17 | 21 | 144 | PL | (Corr'd Nav, Kongsberg 14208, img#32) (B) (T.A) |
| 06-Apr-2023 | 11:47:13 | 1906 | ECR_ENV_11 | | | camera | 65 | 527385 | 6419367 | 527403 | 6419346 | -18 | 21 | 27 | 139 | PL | (Corr'd Nav, Kongsberg 14208, img#33) (B) (T.A) |
| 06-Apr-2023 | 11:47:28 | 1907 | ECR_ENV_11 | | | camera | 65 | 527384 | 6419368 | 527403 | 6419346 | -19 | 22 | 29 | 140 | PL | (Corr'd Nav, Kongsberg 14208, img#34) (B) (T.A) |
| 06-Apr-2023 | 11:47:41 | 1908 | ECR_ENV_11 | | | camera | 65 | 527384 | 6419370 | 527403 | 6419346 | -19 | 24 | 31 | 142 | PL | (Corr'd Nav, Kongsberg 14208, img#35) (B) (T.A) |
| 06-Apr-2023 | 11:47:51 | 1909 | ECR_ENV_11 | | | camera | 65 | 527380 | 6419372 | 527403 | 6419346 | -22 | 26 | 34 | 139 | PL | (Corr'd Nav, Kongsberg 14208, img#36) (B) (T.A) |
| 06-Apr-2023 | 11:48:07 | 1910 | ECR_ENV_11 | | | camera | 65 | 527379 | 6419373 | 527403 | 6419346 | -24 | 27 | 36 | 138 | PL | (Corr'd Nav, Kongsberg 14208, img#37) (B) (T.A) |
| 06-Apr-2023 | 11:48:20 | 1911 | ECR_ENV_11 | | | camera | 65 | 527377 | 6419374 | 527403 | 6419346 | -26 | 28 | 38 | 138 | PL | (Corr'd Nav, Kongsberg 14208, img#38) (B) (T.A) |
| 06-Apr-2023 | 11:49:07 | 1912 | ECR_ENV_11 | | | camera | 65 | 527373 | 6419377 | 527403 | 6419346 | -30 | 31 | 43 | 136 | PL | (Corr'd Nav, Kongsberg 14208, img#39) (B) (T.A) |
| 06-Apr-2023 | 11:49:46 | 1913 | ECR_ENV_11 | | | camera | 65 | 527375 | 6419377 | 527403 | 6419346 | -28 | 31 | 42 | 138 | PL | (Corr'd Nav, Kongsberg 14208, img#40) (B) (T.A) |
| 06-Apr-2023 | 11:50:22 | 1914 | ECR_ENV_11 | | | camera | 65 | 527375 | 6419377 | 527403 | 6419346 | -28 | 31 | 42 | 138 | PL | (Corr'd Nav, Kongsberg 14208, img#41) (B) (T.A) |
| 06-Apr-2023 | 13:23:52 | 1915 | ECR_ENV_22 | | | camera | 61 | 526455 | 6421359 | 526406 | 6421398 | 48 | -40 | 62 | -51 | SG | (Corr'd Nav, Kongsberg 14208, img#1) (B) (T.A) |
| 06-Apr-2023 | 13:24:05 | 1916 | ECR_ENV_22 | | | camera | 61 | 526454 | 6421358 | 526406 | 6421398 | 47 | -40 | 62 | -50 | SG | (Corr'd Nav, Kongsberg 14208, img#2) (B) (T.A) |
| 06-Apr-2023 | 13:24:20 | 1917 | ECR_ENV_22 | | | camera | 61 | 526454 | 6421359 | 526406 | 6421398 | 47 | -40 | 62 | -50 | SG | (Corr'd Nav, Kongsberg 14208, img#3) (B) (T.A) |
| 06-Apr-2023 | 13:24:55 | 1918 | ECR_ENV_22 | | | camera | 61 | 526451 | 6421362 | 526406 | 6421398 | 44 | -36 | 57 | -51 | SG | (Corr'd Nav, Kongsberg 14208, img#4) (B) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 | |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 06-Apr-2023 | 13:25:08 | 1919 | ECR_ENV_22 | | | camera | 61 | 526448 | 6421364 | 526406 | 6421398 | 41 | -34 | 53 | -50 | SG | (Corr'd Nav, Kongsberg 14208, img#5) (B) (T.A) |
| 06-Apr-2023 | 13:25:35 | 1920 | ECR_ENV_22 | | | camera | 61 | 526445 | 6421367 | 526406 | 6421398 | 38 | -31 | 49 | -51 | SG | (Corr'd Nav, Kongsberg 14208, img#6) (B) (T.A) |
| 06-Apr-2023 | 13:26:27 | 1921 | ECR_ENV_22 | | | camera | 62 | 526440 | 6421374 | 526406 | 6421398 | 34 | -24 | 41 | -54 | SG | (Raw Nav, Kongsberg 14208, img#7) (B) |
| 06-Apr-2023 | 13:26:37 | 1922 | ECR_ENV_22 | | | camera | 61 | 526438 | 6421376 | 526406 | 6421398 | 31 | -22 | 38 | -55 | SG | (Corr'd Nav, Kongsberg 14208, img#8) (B) (T.A) |
| 06-Apr-2023 | 13:27:00 | 1923 | ECR_ENV_22 | | | camera | 61 | 526435 | 6421380 | 526406 | 6421398 | 29 | -18 | 34 | -58 | SG | (Corr'd Nav, Kongsberg 14208, img#9) (B) (T.A) |
| 06-Apr-2023 | 13:27:16 | 1924 | ECR_ENV_22 | | | camera | 61 | 526433 | 6421383 | 526406 | 6421398 | 27 | -15 | 31 | -60 | SG | (Corr'd Nav, Kongsberg 14208, img#10) (B) (T.A) |
| 06-Apr-2023 | 13:28:05 | 1925 | ECR_ENV_22 | | | camera | 61 | 526426 | 6421390 | 526406 | 6421398 | 19 | -8 | 21 | -68 | SG | (Corr'd Nav, Kongsberg 14208, img#11) (B) (T.A) |
| 06-Apr-2023 | 13:28:19 | 1926 | ECR_ENV_22 | | | camera | 61 | 526423 | 6421392 | 526406 | 6421398 | 16 | -6 | 17 | -70 | SG | (Corr'd Nav, Kongsberg 14208, img#12) (B) (T.A) |
| 06-Apr-2023 | 13:28:28 | 1927 | ECR_ENV_22 | | | camera | 61 | 526421 | 6421392 | 526406 | 6421398 | 15 | -6 | 16 | -67 | SG | (Corr'd Nav, Kongsberg 14208, img#13) (B) (T.A) |
| 06-Apr-2023 | 13:28:45 | 1928 | ECR_ENV_22 | | | camera | 61 | 526420 | 6421393 | 526406 | 6421398 | 14 | -5 | 15 | -72 | SG | (Corr'd Nav, Kongsberg 14208, img#14) (B) (T.A) |
| 06-Apr-2023 | 13:29:02 | 1929 | ECR_ENV_22 | | | camera | 61 | 526417 | 6421392 | 526406 | 6421398 | 11 | -6 | 12 | -62 | SG | (Corr'd Nav, Kongsberg 14208, img#15) (B) (T.A) |
| 06-Apr-2023 | 13:29:23 | 1930 | ECR_ENV_22 | | | camera | 61 | 526416 | 6421393 | 526406 | 6421398 | 9 | -5 | 10 | -61 | SG | (Corr'd Nav, Kongsberg 14208, img#16) (B) (T.A) |
| 06-Apr-2023 | 13:29:40 | 1931 | ECR_ENV_22 | | | camera | 61 | 526415 | 6421394 | 526406 | 6421398 | 8 | -4 | 9 | -61 | SG | (Corr'd Nav, Kongsberg 14208, img#17) (B) (T.A) |
| 06-Apr-2023 | 13:30:11 | 1932 | ECR_ENV_22 | | | camera | 61 | 526409 | 6421395 | 526406 | 6421398 | 3 | -3 | 4 | -42 | SG | (Corr'd Nav, Kongsberg 14208, img#18) (B) (T.A) |
| 06-Apr-2023 | 13:30:40 | 1933 | ECR_ENV_22 | | | camera | 61 | 526408 | 6421397 | 526406 | 6421398 | 1 | -1 | 1 | -61 | SG | (Corr'd Nav, Kongsberg 14208, img#19) (B) (T.A) |
| 06-Apr-2023 | 13:30:47 | 1934 | ECR_ENV_22 | | | camera | 61 | 526405 | 6421399 | 526406 | 6421398 | -1 | 1 | 2 | 115 | SG | (Corr'd Nav, Kongsberg 14208, img#20) (B) (T.A) |
| 06-Apr-2023 | 13:31:02 | 1935 | ECR_ENV_22 | | | camera | 61 | 526402 | 6421401 | 526406 | 6421398 | -4 | 3 | 5 | 127 | SG | (Corr'd Nav, Kongsberg 14208, img#21) (B) (T.A) |
| 06-Apr-2023 | 13:31:15 | 1936 | ECR_ENV_22 | | | camera | 61 | 526402 | 6421403 | 526406 | 6421398 | -5 | 5 | 7 | 136 | SG | (Corr'd Nav, Kongsberg 14208, img#22) (B) (T.A) |
| 06-Apr-2023 | 13:31:30 | 1937 | ECR_ENV_22 | | | camera | 61 | 526400 | 6421406 | 526406 | 6421398 | -7 | 8 | 10 | 140 | SG | (Corr'd Nav, Kongsberg 14208, img#23) (B) (T.A) |
| 06-Apr-2023 | 13:31:46 | 1938 | ECR_ENV_22 | | | camera | 61 | 526400 | 6421409 | 526406 | 6421398 | -7 | 11 | 13 | 147 | SG | (Corr'd Nav, Kongsberg 14208, img#24) (B) (T.A) |
| 06-Apr-2023 | 13:31:59 | 1939 | ECR_ENV_22 | | | camera | 61 | 526398 | 6421410 | 526406 | 6421398 | -9 | 12 | 15 | 144 | SG | (Corr'd Nav, Kongsberg 14208, img#25) (B) (T.A) |
| 06-Apr-2023 | 13:32:22 | 1940 | ECR_ENV_22 | | | camera | 61 | 526392 | 6421412 | 526406 | 6421398 | -14 | 14 | 20 | 134 | SG | (Corr'd Nav, Kongsberg 14208, img#26) (B) (T.A) |
| 06-Apr-2023 | 13:32:34 | 1941 | ECR_ENV_22 | | | camera | 61 | 526391 | 6421413 | 526406 | 6421398 | -15 | 15 | 21 | 134 | SG | (Corr'd Nav, Kongsberg 14208, img#27) (B) (T.A) |
| 06-Apr-2023 | 13:32:50 | 1942 | ECR_ENV_22 | | | camera | 61 | 526387 | 6421414 | 526406 | 6421398 | -20 | 16 | 25 | 129 | SG | (Corr'd Nav, Kongsberg 14208, img#28) (B) (T.A) |
| 06-Apr-2023 | 13:33:00 | 1943 | ECR_ENV_22 | | | camera | 61 | 526388 | 6421413 | 526406 | 6421398 | -19 | 15 | 24 | 130 | SG | (Corr'd Nav, Kongsberg 14208, img#29) (B) (T.A) |
| 06-Apr-2023 | 13:33:09 | 1944 | ECR_ENV_22 | | | camera | 61 | 526385 | 6421416 | 526406 | 6421398 | -22 | 18 | 28 | 129 | SG | (Corr'd Nav, Kongsberg 14208, img#30) (B) (T.A) |
| 06-Apr-2023 | 13:33:17 | 1945 | ECR_ENV_22 | | | camera | 61 | 526384 | 6421417 | 526406 | 6421398 | -23 | 19 | 30 | 130 | SG | (Corr'd Nav, Kongsberg 14208, img#31) (B) (T.A) |
| 06-Apr-2023 | 13:33:30 | 1946 | ECR_ENV_22 | | | camera | 61 | 526383 | 6421420 | 526406 | 6421398 | -24 | 22 | 32 | 132 | SG | (Corr'd Nav, Kongsberg 14208, img#32) (B) (T.A) |
| 06-Apr-2023 | 13:33:37 | 1947 | ECR_ENV_22 | | | camera | 62 | 526381 | 6421420 | 526406 | 6421398 | -25 | 22 | 34 | 131 | SG | (Raw Nav, Kongsberg 14208, img#33) (B) |
| 06-Apr-2023 | 13:33:46 | 1947a | ECR_ENV_22 | | | camera | 61 | 526381 | 6421423 | 526406 | 6421398 | -25 | 25 | 35 | 135 | SG | (Corr'd Nav, Kongsberg 14208, img#34) (B) (T.A) # Double Fix |
| 06-Apr-2023 | 13:33:58 | 1948 | ECR_ENV_22 | | | camera | 61 | 526380 | 6421426 | 526406 | 6421398 | -26 | 28 | 38 | 137 | SG | (Corr'd Nav, Kongsberg 14208, img#35) (B) (T.A) |
| 06-Apr-2023 | 13:34:07 | 1949 | ECR_ENV_22 | | | camera | 61 | 526381 | 6421427 | 526406 | 6421398 | -26 | 29 | 39 | 138 | SG | (Corr'd Nav, Kongsberg 14208, img#36) (B) (T.A) |
| 06-Apr-2023 | 13:34:14 | 1950 | ECR_ENV_22 | | | camera | 61 | 526381 | 6421428 | 526406 | 6421398 | -26 | 30 | 40 | 140 | SG | (Corr'd Nav, Kongsberg 14208, img#37) (B) (T.A) |
| 06-Apr-2023 | 13:34:28 | 1951 | ECR_ENV_22 | | | camera | 61 | 526380 | 6421431 | 526406 | 6421398 | -26 | 33 | 42 | 142 | SG | (Corr'd Nav, Kongsberg 14208, img#38) (B) (T.A) |
| 06-Apr-2023 | 13:34:35 | 1952 | ECR_ENV_22 | | | camera | 61 | 526380 | 6421432 | 526406 | 6421398 | -27 | 34 | 43 | 142 | SG | (Corr'd Nav, Kongsberg 14208, img#39) (B) (T.A) |
| 06-Apr-2023 | 13:34:44 | 1953 | ECR_ENV_22 | | | camera | 61 | 526380 | 6421434 | 526406 | 6421398 | -26 | 36 | 44 | 144 | SG | (Corr'd Nav, Kongsberg 14208, img#40) (B) (T.A) |
| 06-Apr-2023 | 14:37:27 | 1955 | ECR_ENV_03 | | | camera | 72 | 527855 | 6422307 | 527815 | 6422341 | 40 | -34 | 52 | -50 | SG | (Corr'd Nav, Kongsberg 14208, img#41) (B) (T.A) |
| 06-Apr-2023 | 14:37:34 | 1956 | ECR_ENV_03 | | | camera | 72 | 527855 | 6422308 | 527815 | 6422341 | 40 | -33 | 52 | -51 | SG | (Corr'd Nav, Kongsberg 14208, img#42) (B) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

## Seafloor Sampling Positioning Summary

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | | Vessel | MV *Ocean Endeavour* | | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | | Vessel Reference Point (VRP) | COG | | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 | |
| Primary Positioning System | Starpack 1 | | | | Actual Coordinates derived from | Vessel | | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | | Projection | UTM zone 30N | | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 06-Apr-2023 | 14:37:58 | 1957 | ECR_ENV_03 | | | camera | 72 | 527854 | 6422308 | 527815 | 6422341 | 39 | -32 | 51 | -51 | SG | (Corr'd Nav, Kongsberg 14208, img#43) (B) (T.A) |
| 06-Apr-2023 | 14:38:21 | 1958 | ECR_ENV_03 | | | camera | 72 | 527853 | 6422309 | 527815 | 6422341 | 38 | -32 | 49 | -50 | SG | (Corr'd Nav, Kongsberg 14208, img#44) (B) (T.A) |
| 06-Apr-2023 | 14:38:34 | 1959 | ECR_ENV_03 | | | camera | 72 | 527851 | 6422310 | 527815 | 6422341 | 36 | -30 | 47 | -50 | SG | (Corr'd Nav, Kongsberg 14208, img#45) (B) (T.A) |
| 06-Apr-2023 | 14:39:06 | 1960 | ECR_ENV_03 | | | camera | 72 | 527850 | 6422315 | 527815 | 6422341 | 35 | -26 | 43 | -54 | SG | (Raw Nav, Kongsberg 14208, img#46) (B) |
| 06-Apr-2023 | 14:39:13 | 1961 | ECR_ENV_03 | | | camera | 73 | 527847 | 6422314 | 527815 | 6422341 | 32 | -27 | 42 | -50 | SG | (Raw Nav, Kongsberg 14208, img#47) (B) |
| 06-Apr-2023 | 14:39:26 | 1962 | ECR_ENV_03 | | | camera | 72 | 527848 | 6422317 | 527815 | 6422341 | 33 | -24 | 41 | -54 | SG | (Raw Nav, Kongsberg 14208, img#48) (B) |
| 06-Apr-2023 | 14:39:41 | 1963 | ECR_ENV_03 | | | camera | 73 | 527844 | 6422316 | 527815 | 6422341 | 29 | -25 | 38 | -50 | SG | (Raw Nav, Kongsberg 14208, img#49) (B) |
| 06-Apr-2023 | 14:39:53 | 1964 | ECR_ENV_03 | | | camera | 73 | 527843 | 6422317 | 527815 | 6422341 | 28 | -24 | 37 | -50 | SG | (Raw Nav, Kongsberg 14208, img#50) (B) |
| 06-Apr-2023 | 14:40:07 | 1965 | ECR_ENV_03 | | | camera | 73 | 527842 | 6422319 | 527815 | 6422341 | 27 | -22 | 35 | -51 | SG | (Raw Nav, Kongsberg 14208, img#51) (B) |
| 06-Apr-2023 | 14:40:29 | 1966 | ECR_ENV_03 | | | camera | 72 | 527841 | 6422322 | 527815 | 6422341 | 26 | -19 | 32 | -54 | SG | (Raw Nav, Kongsberg 14208, img#52) (B) |
| 06-Apr-2023 | 14:40:53 | 1967 | ECR_ENV_03 | | | camera | 72 | 527838 | 6422324 | 527815 | 6422341 | 23 | -17 | 28 | -54 | SG | (Raw Nav, Kongsberg 14208, img#53) (B) |
| 06-Apr-2023 | 14:41:03 | 1968 | ECR_ENV_03 | | | camera | 73 | 527836 | 6422325 | 527815 | 6422341 | 21 | -16 | 26 | -53 | SG | (Raw Nav, Kongsberg 14208, img#54) (B) |
| 06-Apr-2023 | 14:41:20 | 1969 | ECR_ENV_03 | | | camera | 73 | 527832 | 6422327 | 527815 | 6422341 | 17 | -14 | 22 | -51 | SG | (Raw Nav, Kongsberg 14208, img#55) (B) |
| 06-Apr-2023 | 14:41:42 | 1970 | ECR_ENV_03 | | | camera | 72 | 527829 | 6422331 | 527815 | 6422341 | 14 | -10 | 17 | -55 | SG | (Raw Nav, Kongsberg 14208, img#56) (B) |
| 06-Apr-2023 | 14:41:59 | 1971 | ECR_ENV_03 | | | camera | 73 | 527828 | 6422332 | 527815 | 6422341 | 13 | -9 | 16 | -56 | SG | (Raw Nav, Kongsberg 14208, img#57) (B) |
| 06-Apr-2023 | 14:42:15 | 1972 | ECR_ENV_03 | | | camera | 72 | 527825 | 6422336 | 527815 | 6422341 | 10 | -5 | 11 | -65 | SG | (Raw Nav, Kongsberg 14208, img#58) (B) |
| 06-Apr-2023 | 14:42:30 | 1973 | ECR_ENV_03 | | | camera | 72 | 527824 | 6422338 | 527815 | 6422341 | 9 | -3 | 9 | -74 | SG | (Raw Nav, Kongsberg 14208, img#59) (B) |
| 06-Apr-2023 | 14:42:38 | 1974 | ECR_ENV_03 | | | camera | 72 | 527821 | 6422338 | 527815 | 6422341 | 6 | -3 | 6 | -66 | SG | (Raw Nav, Kongsberg 14208, img#60) (B) |
| 06-Apr-2023 | 14:43:01 | 1975 | ECR_ENV_03 | | | camera | 72 | 527820 | 6422343 | 527815 | 6422341 | 5 | 2 | 5 | -116 | SG | (Raw Nav, Kongsberg 14208, img#61) (B) |
| 06-Apr-2023 | 14:43:14 | 1976 | ECR_ENV_03 | | | camera | 72 | 527816 | 6422342 | 527815 | 6422341 | 1 | 1 | 2 | -146 | SG | (Raw Nav, Kongsberg 14208, img#62) (B) |
| 06-Apr-2023 | 14:43:24 | 1977 | ECR_ENV_03 | | | camera | 72 | 527815 | 6422342 | 527815 | 6422341 | 0 | 1 | 1 | 178 | SG | (Raw Nav, Kongsberg 14208, img#63) (B) |
| 06-Apr-2023 | 14:43:40 | 1978 | ECR_ENV_03 | | | camera | 72 | 527812 | 6422346 | 527815 | 6422341 | -3 | 5 | 6 | 150 | SG | (Raw Nav, Kongsberg 14208, img#64) (B) |
| 06-Apr-2023 | 14:43:55 | 1979 | ECR_ENV_03 | | | camera | 72 | 527810 | 6422350 | 527815 | 6422341 | -5 | 9 | 11 | 152 | SG | (Raw Nav, Kongsberg 14208, img#65) (B) |
| 06-Apr-2023 | 14:44:02 | 1980 | ECR_ENV_03 | | | camera | 73 | 527807 | 6422350 | 527815 | 6422341 | -8 | 9 | 12 | 139 | SG | (Raw Nav, Kongsberg 14208, img#66) (B) |
| 06-Apr-2023 | 14:44:11 | 1981 | ECR_ENV_03 | | | camera | 73 | 527807 | 6422352 | 527815 | 6422341 | -8 | 11 | 14 | 145 | SG | (Raw Nav, Kongsberg 14208, img#67) (B) |
| 06-Apr-2023 | 14:44:30 | 1982 | ECR_ENV_03 | | | camera | 72 | 527806 | 6422355 | 527815 | 6422341 | -9 | 14 | 17 | 148 | SG | (Raw Nav, Kongsberg 14208, img#68) (B)<br># No photo taken |
| 06-Apr-2023 | 14:44:43 | 1983 | ECR_ENV_03 | | | camera | 73 | 527806 | 6422356 | 527815 | 6422341 | -9 | 15 | 18 | 150 | SG | (Raw Nav, Kongsberg 14208, img#69) (B) |
| 06-Apr-2023 | 14:44:54 | 1984 | ECR_ENV_03 | | | camera | 73 | 527806 | 6422361 | 527815 | 6422341 | -9 | 20 | 22 | 156 | SG | (Raw Nav, Kongsberg 14208, img#70) (B) |
| 06-Apr-2023 | 14:45:10 | 1985 | ECR_ENV_03 | | | camera | 72 | 527804 | 6422362 | 527815 | 6422341 | -11 | 21 | 24 | 153 | SG | (Raw Nav, Kongsberg 14208, img#71) (B) |
| 06-Apr-2023 | 14:45:30 | 1986 | ECR_ENV_03 | | | camera | 72 | 527803 | 6422363 | 527815 | 6422341 | -12 | 22 | 25 | 152 | SG | (Raw Nav, Kongsberg 14208, img#72) (B) |
| 06-Apr-2023 | 14:45:37 | 1987 | ECR_ENV_03 | | | camera | 72 | 527801 | 6422362 | 527815 | 6422341 | -14 | 21 | 26 | 147 | SG | (Raw Nav, Kongsberg 14208, img#73) (B) |
| 06-Apr-2023 | 14:46:14 | 1988 | ECR_ENV_03 | | | camera | 72 | 527794 | 6422356 | 527815 | 6422341 | -21 | 15 | 26 | 126 | SG | (Raw Nav, Kongsberg 14208, img#74) (B) |
| 06-Apr-2023 | 14:46:32 | 1989 | ECR_ENV_03 | | | camera | 72 | 527792 | 6422357 | 527815 | 6422341 | -23 | 16 | 28 | 125 | SG | (Raw Nav, Kongsberg 14208, img#75) (B) |
| 06-Apr-2023 | 14:46:45 | 1990 | ECR_ENV_03 | | | camera | 72 | 527788 | 6422357 | 527815 | 6422341 | -27 | 16 | 32 | 121 | SG | (Raw Nav, Kongsberg 14208, img#76) (B) |
| 06-Apr-2023 | 14:46:53 | 1991 | ECR_ENV_03 | | | camera | 72 | 527787 | 6422356 | 527815 | 6422341 | -28 | 15 | 32 | 119 | SG | (Raw Nav, Kongsberg 14208, img#77) (B) |
| 06-Apr-2023 | 14:47:05 | 1992 | ECR_ENV_03 | | | camera | 72 | 527785 | 6422356 | 527815 | 6422341 | -30 | 15 | 34 | 117 | SG | (Raw Nav, Kongsberg 14208, img#78) (B) |
| 06-Apr-2023 | 14:47:37 | 1993 | ECR_ENV_03 | | | camera | 72 | 527782 | 6422361 | 527815 | 6422341 | -33 | 20 | 39 | 122 | SG | (Raw Nav, Kongsberg 14208, img#79) (B) |
| 06-Apr-2023 | 14:47:50 | 1994 | ECR_ENV_03 | | | camera | 72 | 527783 | 6422365 | 527815 | 6422341 | -32 | 24 | 40 | 127 | SG | (Raw Nav, Kongsberg 14208, img#80) (B) |

# APPENDIX B FIELD SAMPLING LOGS

Seafloor Sampling Positioning Summary

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | | Vessel | MV *Ocean Endeavour* | | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | | Vessel Reference Point (VRP) | COG | | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 | |
| Primary Positioning System | Starpack 1 | | | | Actual Coordinates derived from | Vessel | | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | | Projection | UTM zone 30N | | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 06-Apr-2023 | 14:48:05 | 1995 | ECR_ENV_03 | | | camera | 72 | 527781 | 6422369 | 527815 | 6422341 | -34 | 28 | 44 | 130 | SG | (Raw Nav, Kongsberg 14208, img#81) (B) |
| 13-Apr-2023 | 18:59:24 | 1996 | ECR_ENV_29 | | | camera | 81 | 526514 | 6423579 | 526548 | 6423621 | -34 | -42 | 54 | 39 | SG | (Corr'd Nav, Kongsberg 14208, img#1) (B) (T.A) |
| 13-Apr-2023 | 18:59:38 | 1997 | ECR_ENV_29 | | | camera | 81 | 526515 | 6423581 | 526548 | 6423621 | -33 | -40 | 52 | 40 | SG | (Corr'd Nav, Kongsberg 14208, img#2) (B) (T.A) |
| 13-Apr-2023 | 19:00:19 | 1998 | ECR_ENV_29 | | | camera | 81 | 526523 | 6423582 | 526548 | 6423621 | -25 | -39 | 47 | 33 | SG | (Corr'd Nav, Kongsberg 14208, img#3) (B) (T.A) |
| 13-Apr-2023 | 19:00:35 | 1999 | ECR_ENV_29 | | | camera | 81 | 526522 | 6423588 | 526548 | 6423621 | -26 | -33 | 42 | 38 | SG | (Corr'd Nav, Kongsberg 14208, img#4) (B) (T.A) |
| 13-Apr-2023 | 19:01:06 | 2000 | ECR_ENV_29 | | | camera | 81 | 526524 | 6423592 | 526548 | 6423621 | -25 | -29 | 38 | 40 | SG | (Corr'd Nav, Kongsberg 14208, img#5) (B) (T.A) |
| 13-Apr-2023 | 19:01:13 | 2001 | ECR_ENV_29 | | | camera | 81 | 526525 | 6423593 | 526548 | 6423621 | -23 | -28 | 36 | 40 | SG | (Corr'd Nav, Kongsberg 14208, img#6) (B) (T.A) |
| 13-Apr-2023 | 19:01:32 | 2002 | ECR_ENV_29 | | | camera | 81 | 526527 | 6423595 | 526548 | 6423621 | -21 | -26 | 33 | 39 | SG | (Corr'd Nav, Kongsberg 14208, img#7) (B) (T.A) |
| 13-Apr-2023 | 19:02:32 | 2003 | ECR_ENV_29 | | | camera | 81 | 526536 | 6423595 | 526548 | 6423621 | -12 | -26 | 29 | 25 | SG | (Corr'd Nav, Kongsberg 14208, img#8) (B) (T.A) |
| 13-Apr-2023 | 19:03:03 | 2004 | ECR_ENV_29 | | | camera | 81 | 526534 | 6423601 | 526548 | 6423621 | -15 | -20 | 24 | 37 | SG | (Corr'd Nav, Kongsberg 14208, img#9) (B) (T.A) |
| 13-Apr-2023 | 19:03:11 | 2005 | ECR_ENV_29 | | | camera | 81 | 526537 | 6423604 | 526548 | 6423621 | -12 | -17 | 20 | 35 | SG | (Corr'd Nav, Kongsberg 14208, img#10) (B) (T.A) |
| 13-Apr-2023 | 19:03:18 | 2006 | ECR_ENV_29 | | | camera | 81 | 526537 | 6423606 | 526548 | 6423621 | -11 | -15 | 19 | 36 | SG | (Corr'd Nav, Kongsberg 14208, img#11) (B) (T.A) |
| 13-Apr-2023 | 19:03:27 | 2007 | ECR_ENV_29 | | | camera | 81 | 526543 | 6423605 | 526548 | 6423621 | -5 | -16 | 17 | 19 | SG | (Corr'd Nav, Kongsberg 14208, img#12) (B) (T.A) |
| 13-Apr-2023 | 19:03:34 | 2008 | ECR_ENV_29 | | | camera | 81 | 526539 | 6423608 | 526548 | 6423621 | -9 | -13 | 16 | 37 | SG | (Corr'd Nav, Kongsberg 14208, img#13) (B) (T.A) |
| 13-Apr-2023 | 19:04:12 | 2009 | ECR_ENV_29 | | | camera | 81 | 526544 | 6423610 | 526548 | 6423621 | -4 | -11 | 12 | 21 | SG | (Corr'd Nav, Kongsberg 14208, img#14) (B) (T.A) |
| 13-Apr-2023 | 19:04:21 | 2010 | ECR_ENV_29 | | | camera | 81 | 526544 | 6423610 | 526548 | 6423621 | -4 | -11 | 11 | 20 | SG | (Corr'd Nav, Kongsberg 14208, img#15) (B) (T.A) # No photo taken |
| 13-Apr-2023 | 19:04:57 | 2011 | ECR_ENV_29 | | | camera | 82 | 526548 | 6423614 | 526548 | 6423621 | 0 | -7 | 7 | 0 | SG | (Corr'd Nav, Kongsberg 14208, img#16) (B) (T.A) |
| 13-Apr-2023 | 19:05:13 | 2012 | ECR_ENV_29 | | | camera | 81 | 526548 | 6423617 | 526548 | 6423621 | 0 | -4 | 4 | 1 | SG | (Corr'd Nav, Kongsberg 14208, img#17) (B) (T.A) |
| 13-Apr-2023 | 19:05:22 | 2013 | ECR_ENV_29 | | | camera | 81 | 526550 | 6423619 | 526548 | 6423621 | 1 | -2 | 3 | -30 | SG | (Corr'd Nav, Kongsberg 14208, img#18) (B) (T.A) |
| 13-Apr-2023 | 19:05:48 | 2014 | ECR_ENV_29 | | | camera | 81 | 526552 | 6423625 | 526548 | 6423621 | 4 | 4 | 6 | -134 | SG | (Corr'd Nav, Kongsberg 14208, img#19) (B) (T.A) # No photo taken |
| 13-Apr-2023 | 19:05:55 | 2015 | ECR_ENV_29 | | | camera | 82 | 526550 | 6423624 | 526548 | 6423621 | 2 | 3 | 4 | -148 | SG | (Corr'd Nav, Kongsberg 14208, img#20) (B) (T.A) |
| 13-Apr-2023 | 19:06:43 | 2016 | ECR_ENV_29 | | | camera | 81 | 526556 | 6423627 | 526548 | 6423621 | 8 | 7 | 10 | -130 | SG | (Corr'd Nav, Kongsberg 14208, img#21) (B) (T.A) |
| 13-Apr-2023 | 19:07:00 | 2017 | ECR_ENV_29 | | | camera | 82 | 526556 | 6423627 | 526548 | 6423621 | 8 | 6 | 10 | -128 | SG | (Corr'd Nav, Kongsberg 14208, img#22) (B) (T.A) |
| 13-Apr-2023 | 19:07:14 | 2018 | ECR_ENV_29 | | | camera | 82 | 526559 | 6423630 | 526548 | 6423621 | 11 | 9 | 14 | -130 | SG | (Corr'd Nav, Kongsberg 14208, img#23) (B) (T.A) |
| 13-Apr-2023 | 19:07:21 | 2019 | ECR_ENV_29 | | | camera | 81 | 526561 | 6423630 | 526548 | 6423621 | 13 | 9 | 16 | -126 | SG | (Corr'd Nav, Kongsberg 14208, img#24) (B) (T.A) |
| 13-Apr-2023 | 19:07:43 | 2020 | ECR_ENV_29 | | | camera | 82 | 526560 | 6423634 | 526548 | 6423621 | 11 | 13 | 17 | -139 | SG | (Corr'd Nav, Kongsberg 14208, img#25) (B) (T.A) |
| 13-Apr-2023 | 19:08:15 | 2021 | ECR_ENV_29 | | | camera | 82 | 526566 | 6423635 | 526548 | 6423621 | 18 | 14 | 23 | -129 | SG | (Corr'd Nav, Kongsberg 14208, img#26) (B) (T.A) |
| 13-Apr-2023 | 19:08:22 | 2022 | ECR_ENV_29 | | | camera | 82 | 526569 | 6423635 | 526548 | 6423621 | 20 | 15 | 25 | -125 | SG | (Corr'd Nav, Kongsberg 14208, img#27) (B) (T.A) |
| 13-Apr-2023 | 19:08:29 | 2023 | ECR_ENV_29 | | | camera | 82 | 526565 | 6423639 | 526548 | 6423621 | 17 | 18 | 25 | -138 | SG | (Corr'd Nav, Kongsberg 14208, img#28) (B) (T.A) |
| 13-Apr-2023 | 19:08:52 | 2024 | ECR_ENV_29 | | | camera | 82 | 526568 | 6423637 | 526548 | 6423621 | 20 | 16 | 26 | -129 | SG | (Corr'd Nav, Kongsberg 14208, img#29) (B) (T.A) |
| 13-Apr-2023 | 19:09:01 | 2025 | ECR_ENV_29 | | | camera | 82 | 526566 | 6423640 | 526548 | 6423621 | 18 | 19 | 26 | -137 | SG | (Corr'd Nav, Kongsberg 14208, img#30) (B) (T.A) |
| 13-Apr-2023 | 19:09:11 | 2026 | ECR_ENV_29 | | | camera | 82 | 526568 | 6423640 | 526548 | 6423621 | 20 | 19 | 27 | -135 | SG | (Corr'd Nav, Kongsberg 14208, img#31) (B) (T.A) |
| 13-Apr-2023 | 19:09:25 | 2027 | ECR_ENV_29 | | | camera | 82 | 526570 | 6423643 | 526548 | 6423621 | 22 | 22 | 31 | -136 | SG | (Corr'd Nav, Kongsberg 14208, img#32) (B) (T.A) |
| 13-Apr-2023 | 19:09:36 | 2028 | ECR_ENV_29 | | | camera | 82 | 526572 | 6423643 | 526548 | 6423621 | 23 | 22 | 32 | -134 | SG | (Corr'd Nav, Kongsberg 14208, img#33) (B) (T.A) |
| 13-Apr-2023 | 19:09:55 | 2029 | ECR_ENV_29 | | | camera | 82 | 526577 | 6423642 | 526548 | 6423621 | 29 | 22 | 36 | -127 | SG | (Corr'd Nav, Kongsberg 14208, img#34) (B) (T.A) |
| 13-Apr-2023 | 19:10:26 | 2030 | ECR_ENV_29 | | | camera | 82 | 526578 | 6423648 | 526548 | 6423621 | 30 | 27 | 40 | -133 | SG | (Corr'd Nav, Kongsberg 14208, img#35) (B) (T.A) |
| 13-Apr-2023 | 19:10:33 | 2031 | ECR_ENV_29 | | | camera | 82 | 526577 | 6423650 | 526548 | 6423621 | 29 | 29 | 41 | -135 | SG | (Corr'd Nav, Kongsberg 14208, img#36) (B) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | | Vertical / Tidal Datum | VORF, LAT | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 13-Apr-2023 | 19:10:41 | 2032 | ECR_ENV_29 | | | camera | 82 | 526575 | 6423651 | 526548 | 6423621 | 27 | 31 | 41 | -138 | SG | (Corr'd Nav, Kongsberg 14208, img#37) (B) (T.A) |
| 13-Apr-2023 | 19:11:00 | 2033 | ECR_ENV_29 | | | camera | 82 | 526579 | 6423651 | 526548 | 6423621 | 31 | 31 | 43 | -135 | SG | (Corr'd Nav, Kongsberg 14208, img#38) (B) (T.A) |
| 13-Apr-2023 | 19:11:48 | 2034 | ECR_ENV_29 | | | camera | 82 | 526580 | 6423651 | 526548 | 6423621 | 32 | 30 | 43 | -133 | SG | (Corr'd Nav, Kongsberg 14208, img#39) (B) (T.A) |
| 13-Apr-2023 | 19:11:54 | 2035 | ECR_ENV_29 | | | camera | 82 | 526582 | 6423649 | 526548 | 6423621 | 34 | 28 | 44 | -130 | SG | (Corr'd Nav, Kongsberg 14208, img#40) (B) (T.A) |
| 13-Apr-2023 | 19:12:01 | 2036 | ECR_ENV_29 | | | camera | 82 | 526582 | 6423651 | 526548 | 6423621 | 34 | 30 | 45 | -132 | SG | (Corr'd Nav, Kongsberg 14208, img#41) (B) (T.A) |
| 13-Apr-2023 | 22:38:35 | 2037 | ECR_ENV_28 | | | camera | 76 | 527278 | 6425071 | 527328 | 6425044 | -49 | 27 | 56 | 118 | SG | (Corr'd Nav, Kongsberg 14208, img#1) (B) (T.A) |
| 13-Apr-2023 | 22:38:55 | 2038 | ECR_ENV_28 | | | camera | 76 | 527274 | 6425071 | 527328 | 6425044 | -53 | 27 | 60 | 117 | SG | (Corr'd Nav, Kongsberg 14208, img#2) (B) (T.A) |
| 13-Apr-2023 | 22:39:10 | 2039 | ECR_ENV_28 | | | camera | 76 | 527279 | 6425077 | 527328 | 6425044 | -48 | 33 | 58 | 124 | SG | (Corr'd Nav, Kongsberg 14208, img#3) (B) (T.A) |
| 13-Apr-2023 | 22:39:28 | 2040 | ECR_ENV_28 | | | camera | 76 | 527280 | 6425076 | 527328 | 6425044 | -48 | 31 | 57 | 123 | SG | (Corr'd Nav, Kongsberg 14208, img#4) (B) (T.A) |
| 13-Apr-2023 | 22:39:43 | 2041 | ECR_ENV_28 | | | camera | 76 | 527281 | 6425075 | 527328 | 6425044 | -47 | 31 | 56 | 124 | SG | (Corr'd Nav, Kongsberg 14208, img#5) (B) (T.A) |
| 13-Apr-2023 | 22:40:12 | 2042 | ECR_ENV_28 | | | camera | 76 | 527283 | 6425074 | 527328 | 6425044 | -44 | 30 | 54 | 124 | SG | (Corr'd Nav, Kongsberg 14208, img#6) (B) (T.A) |
| 13-Apr-2023 | 22:40:26 | 2043 | ECR_ENV_28 | | | camera | 76 | 527285 | 6425074 | 527328 | 6425044 | -43 | 30 | 52 | 125 | SG | (Corr'd Nav, Kongsberg 14208, img#7) (B) (T.A) |
| 13-Apr-2023 | 22:40:51 | 2044 | ECR_ENV_28 | | | camera | 76 | 527290 | 6425071 | 527328 | 6425044 | -37 | 27 | 46 | 126 | SG | (Corr'd Nav, Kongsberg 14208, img#8) (B) (T.A) |
| 13-Apr-2023 | 22:40:57 | 2045 | ECR_ENV_28 | | | camera | 76 | 527289 | 6425069 | 527328 | 6425044 | -38 | 25 | 46 | 123 | SG | (Corr'd Nav, Kongsberg 14208, img#9) (B) (T.A) |
| 13-Apr-2023 | 22:41:18 | 2046 | ECR_ENV_28 | | | camera | 76 | 527291 | 6425067 | 527328 | 6425044 | -36 | 23 | 43 | 122 | SG | (Corr'd Nav, Kongsberg 14208, img#10) (B) (T.A) |
| 13-Apr-2023 | 22:41:31 | 2047 | ECR_ENV_28 | | | camera | 76 | 527292 | 6425066 | 527328 | 6425044 | -35 | 22 | 42 | 122 | SG | (Corr'd Nav, Kongsberg 14208, img#11) (B) (T.A) |
| 13-Apr-2023 | 22:41:49 | 2048 | ECR_ENV_28 | | | camera | 76 | 527294 | 6425064 | 527328 | 6425044 | -33 | 20 | 39 | 121 | SG | (Corr'd Nav, Kongsberg 14208, img#12) (B) (T.A) |
| 13-Apr-2023 | 22:42:21 | 2049 | ECR_ENV_28 | | | camera | 76 | 527300 | 6425060 | 527328 | 6425044 | -28 | 16 | 32 | 120 | SG | (Raw Nav, Kongsberg 14208, img#13) (B) |
| 13-Apr-2023 | 22:42:30 | 2050 | ECR_ENV_28 | | | camera | 77 | 527301 | 6425059 | 527328 | 6425044 | -26 | 15 | 30 | 119 | SG | (Corr'd Nav, Kongsberg 14208, img#14) (B) (T.A) |
| 13-Apr-2023 | 22:43:14 | 2051 | ECR_ENV_28 | | | camera | 76 | 527308 | 6425057 | 527328 | 6425044 | -20 | 13 | 24 | 124 | SG | (Corr'd Nav, Kongsberg 14208, img#15) (B) (T.A) |
| 13-Apr-2023 | 22:43:27 | 2052 | ECR_ENV_28 | | | camera | 76 | 527311 | 6425058 | 527328 | 6425044 | -16 | 14 | 21 | 130 | SG | (Corr'd Nav, Kongsberg 14208, img#16) (B) (T.A) |
| 13-Apr-2023 | 22:43:47 | 2053 | ECR_ENV_28 | | | camera | 76 | 527315 | 6425056 | 527328 | 6425044 | -13 | 12 | 17 | 132 | SG | (Corr'd Nav, Kongsberg 14208, img#17) (B) (T.A) |
| 13-Apr-2023 | 22:44:00 | 2054 | ECR_ENV_28 | | | camera | 76 | 527317 | 6425055 | 527328 | 6425044 | -10 | 11 | 15 | 138 | SG | (Corr'd Nav, Kongsberg 14208, img#18) (B) (T.A) |
| 13-Apr-2023 | 22:44:12 | 2055 | ECR_ENV_28 | | | camera | 76 | 527319 | 6425055 | 527328 | 6425044 | -8 | 10 | 13 | 142 | SG | (Corr'd Nav, Kongsberg 14208, img#19) (B) (T.A) |
| 13-Apr-2023 | 22:44:26 | 2056 | ECR_ENV_28 | | | camera | 76 | 527321 | 6425053 | 527328 | 6425044 | -6 | 9 | 11 | 143 | SG | (Corr'd Nav, Kongsberg 14208, img#20) (B) (T.A) |
| 13-Apr-2023 | 22:45:20 | 2057 | ECR_ENV_28 | | | camera | 77 | 527320 | 6425051 | 527328 | 6425044 | -7 | 7 | 10 | 136 | SG | (Corr'd Nav, Kongsberg 14208, img#21) (B) (T.A) |
| 13-Apr-2023 | 22:45:34 | 2058 | ECR_ENV_28 | | | camera | 76 | 527321 | 6425049 | 527328 | 6425044 | -6 | 5 | 8 | 130 | SG | (Corr'd Nav, Kongsberg 14208, img#22) (B) (T.A) |
| 13-Apr-2023 | 22:45:46 | 2059 | ECR_ENV_28 | | | camera | 76 | 527322 | 6425048 | 527328 | 6425044 | -6 | 4 | 7 | 125 | SG | (Corr'd Nav, Kongsberg 14208, img#23) (B) (T.A) |
| 13-Apr-2023 | 22:46:03 | 2060 | ECR_ENV_28 | | | camera | 76 | 527323 | 6425046 | 527328 | 6425044 | -4 | 2 | 5 | 120 | SG | (Corr'd Nav, Kongsberg 14208, img#24) (B) (T.A) |
| 13-Apr-2023 | 22:46:32 | 2061 | ECR_ENV_28 | | | camera | 76 | 527327 | 6425044 | 527328 | 6425044 | 0 | 0 | 0 | 73 | SG | (Corr'd Nav, Kongsberg 14208, img#25) (B) (T.A) |
| 13-Apr-2023 | 22:46:51 | 2062 | ECR_ENV_28 | | | camera | 77 | 527328 | 6425041 | 527328 | 6425044 | 0 | -3 | 3 | -6 | SG | (Corr'd Nav, Kongsberg 14208, img#26) (B) (T.A) |
| 13-Apr-2023 | 22:47:00 | 2063 | ECR_ENV_28 | | | camera | 76 | 527330 | 6425040 | 527328 | 6425044 | 3 | -4 | 5 | -31 | SG | (Corr'd Nav, Kongsberg 14208, img#27) (B) (T.A) |
| 13-Apr-2023 | 22:47:44 | 2064 | ECR_ENV_28 | | | camera | 76 | 527334 | 6425034 | 527328 | 6425044 | 7 | -10 | 12 | -33 | SG | (Corr'd Nav, Kongsberg 14208, img#28) (B) (T.A) |
| 13-Apr-2023 | 22:48:00 | 2065 | ECR_ENV_28 | | | camera | 76 | 527338 | 6425029 | 527328 | 6425044 | 10 | -15 | 18 | -35 | SG | (Corr'd Nav, Kongsberg 14208, img#29) (B) (T.A) |
| 13-Apr-2023 | 22:48:14 | 2066 | ECR_ENV_28 | | | camera | 76 | 527338 | 6425028 | 527328 | 6425044 | 11 | -16 | 19 | -35 | SG | (Corr'd Nav, Kongsberg 14208, img#30) (B) (T.A) |
| 13-Apr-2023 | 22:48:42 | 2067 | ECR_ENV_28 | | | camera | 76 | 527337 | 6425026 | 527328 | 6425044 | 10 | -18 | 20 | -28 | SG | (Corr'd Nav, Kongsberg 14208, img#31) (B) (T.A) |
| 13-Apr-2023 | 22:48:49 | 2068 | ECR_ENV_28 | | | camera | 76 | 527338 | 6425025 | 527328 | 6425044 | 10 | -19 | 21 | -28 | SG | (Corr'd Nav, Kongsberg 14208, img#32) (B) (T.A) |
| 13-Apr-2023 | 22:49:02 | 2069 | ECR_ENV_28 | | | camera | 76 | 527344 | 6425021 | 527328 | 6425044 | 16 | -23 | 28 | -35 | SG | (Corr'd Nav, Kongsberg 14208, img#33) (B) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 13-Apr-2023 | 22:49:12 | 2070 | ECR_ENV_28 | | | camera | 76 | 527344 | 6425020 | 527328 | 6425044 | 17 | -24 | 29 | -35 | SG | (Corr'd Nav, Kongsberg 14208, img#34) (B) (T.A) |
| 13-Apr-2023 | 22:49:25 | 2071 | ECR_ENV_28 | | | camera | 76 | 527347 | 6425018 | 527328 | 6425044 | 20 | -27 | 33 | -36 | SG | (Corr'd Nav, Kongsberg 14208, img#35) (B) (T.A) |
| 13-Apr-2023 | 22:49:33 | 2072 | ECR_ENV_28 | | | camera | 76 | 527349 | 6425017 | 527328 | 6425044 | 22 | -28 | 35 | -38 | SG | (Corr'd Nav, Kongsberg 14208, img#36) (B) (T.A) # No photo taken |
| 13-Apr-2023 | 22:49:40 | 2073 | ECR_ENV_28 | | | camera | 76 | 527350 | 6425015 | 527328 | 6425044 | 23 | -29 | 36 | -38 | SG | (Corr'd Nav, Kongsberg 14208, img#37) (B) (T.A) |
| 13-Apr-2023 | 22:49:49 | 2074 | ECR_ENV_28 | | | camera | 77 | 527351 | 6425015 | 527328 | 6425044 | 24 | -29 | 38 | -39 | SG | (Corr'd Nav, Kongsberg 14208, img#38) (B) (T.A) |
| 13-Apr-2023 | 22:50:13 | 2075 | ECR_ENV_28 | | | camera | 76 | 527356 | 6425013 | 527328 | 6425044 | 29 | -31 | 42 | -42 | SG | (Corr'd Nav, Kongsberg 14208, img#39) (B) (T.A) |
| 13-Apr-2023 | 22:50:23 | 2076 | ECR_ENV_28 | | | camera | 77 | 527355 | 6425011 | 527328 | 6425044 | 27 | -33 | 43 | -40 | SG | (Corr'd Nav, Kongsberg 14208, img#40) (B) (T.A) |
| 13-Apr-2023 | 22:50:38 | 2077 | ECR_ENV_28 | | | camera | 77 | 527361 | 6425012 | 527328 | 6425044 | 34 | -32 | 47 | -46 | SG | (Corr'd Nav, Kongsberg 14208, img#41) (B) (T.A) |
| 07-Apr-2023 | | 2078 | ECR_ENV_10 | | | | | | | | | | | | | PL | Lost connection with EELS, no Fix taken |
| 08-Apr-2023 | | 2079 | ECR_ENV_10 | | | | | | | | | | | | | PL | Lost connection with EELS, no Fix taken |
| 09-Apr-2023 | | 2080 | ECR_ENV_10 | | | | | | | | | | | | | PL | Lost connection with EELS, no Fix taken |
| 10-Apr-2023 | | 2081 | ECR_ENV_10 | | | | | | | | | | | | | PL | Lost connection with EELS, no Fix taken |
| 11-Apr-2023 | | 2082 | ECR_ENV_10 | | | | | | | | | | | | | PL | Lost connection with EELS, no Fix taken |
| 12-Apr-2023 | | 2083 | ECR_ENV_10 | | | | | | | | | | | | | PL | Lost connection with EELS, no Fix taken |
| 13-Apr-2023 | | 2084 | ECR_ENV_10 | | | | | | | | | | | | | PL | Lost connection with EELS, no Fix taken |
| 14-Apr-2023 | 00:33:54 | 2085 | ECR_ENV_10 | | | camera | 77 | 526857 | 6427550 | 526894 | 6427550 | -38 | 0 | 37 | 91 | PL | (Raw Nav, Kongsberg 14208, img#1) (B) |
| 14-Apr-2023 | 00:35:10 | 2086 | ECR_ENV_10 | | | camera | 77 | 526857 | 6427548 | 526894 | 6427550 | -38 | -2 | 37 | 88 | PL | (Raw Nav, Kongsberg 14208, img#2) (B) |
| 14-Apr-2023 | 00:35:15 | 2087 | ECR_ENV_10 | | | camera | 76 | 526859 | 6427550 | 526894 | 6427550 | -36 | 0 | 35 | 91 | PL | (Raw Nav, Kongsberg 14208, img#3) (B) |
| 14-Apr-2023 | 00:35:23 | 2088 | ECR_ENV_10 | | | camera | 77 | 526857 | 6427549 | 526894 | 6427550 | -38 | -1 | 37 | 89 | PL | (Raw Nav, Kongsberg 14208, img#4) (B) |
| 14-Apr-2023 | 00:35:32 | 2089 | ECR_ENV_10 | | | camera | 77 | 526859 | 6427550 | 526894 | 6427550 | -36 | 0 | 35 | 91 | PL | (Raw Nav, Kongsberg 14208, img#5) (B) |
| 14-Apr-2023 | 00:35:46 | 2090 | ECR_ENV_10 | | | camera | 76 | 526860 | 6427550 | 526894 | 6427550 | -35 | 0 | 34 | 91 | PL | (Raw Nav, Kongsberg 14208, img#6) (B) |
| 14-Apr-2023 | 00:35:52 | 2091 | ECR_ENV_10 | | | camera | 76 | 526862 | 6427550 | 526894 | 6427550 | -33 | 0 | 32 | 91 | PL | (Raw Nav, Kongsberg 14208, img#7) (B) |
| 14-Apr-2023 | 00:36:07 | 2092 | ECR_ENV_10 | | | camera | 77 | 526859 | 6427548 | 526894 | 6427550 | -36 | -2 | 35 | 88 | PL | (Raw Nav, Kongsberg 14208, img#8) (B) |
| 14-Apr-2023 | 00:36:14 | 2093 | ECR_ENV_10 | | | camera | 76 | 526862 | 6427551 | 526894 | 6427550 | -33 | 1 | 32 | 93 | PL | (Raw Nav, Kongsberg 14208, img#9) (B) |
| 14-Apr-2023 | 00:36:46 | 2094 | ECR_ENV_10 | | | camera | 77 | 526867 | 6427549 | 526894 | 6427550 | -28 | -1 | 27 | 89 | PL | (Raw Nav, Kongsberg 14208, img#10) (B) |
| 14-Apr-2023 | 00:36:54 | 2095 | ECR_ENV_10 | | | camera | 77 | 526867 | 6427549 | 526894 | 6427550 | -28 | -1 | 27 | 89 | PL | (Raw Nav, Kongsberg 14208, img#11) (B) |
| 14-Apr-2023 | 00:37:06 | 2096 | ECR_ENV_10 | | | camera | 76 | 526867 | 6427546 | 526894 | 6427550 | -28 | -4 | 28 | 83 | PL | (Raw Nav, Kongsberg 14208, img#12) (B) |
| 14-Apr-2023 | 00:37:16 | 2097 | ECR_ENV_10 | | | camera | 77 | 526872 | 6427548 | 526894 | 6427550 | -23 | -2 | 23 | 86 | PL | (Raw Nav, Kongsberg 14208, img#13) (B) |
| 14-Apr-2023 | 00:37:22 | 2098 | ECR_ENV_10 | | | camera | 77 | 526873 | 6427548 | 526894 | 6427550 | -22 | -2 | 22 | 86 | PL | (Raw Nav, Kongsberg 14208, img#14) (B) |
| 14-Apr-2023 | 00:37:29 | 2099 | ECR_ENV_10 | | | camera | 76 | 526875 | 6427549 | 526894 | 6427550 | -20 | -1 | 19 | 88 | PL | (Raw Nav, Kongsberg 14208, img#15) (B) |
| 14-Apr-2023 | 00:37:45 | 2100 | ECR_ENV_10 | | | camera | 77 | 526876 | 6427548 | 526894 | 6427550 | -19 | -2 | 19 | 85 | PL | (Raw Nav, Kongsberg 14208, img#16) (B) |
| 14-Apr-2023 | 00:37:52 | 2101 | ECR_ENV_10 | | | camera | 76 | 526873 | 6427545 | 526894 | 6427550 | -22 | -5 | 22 | 78 | PL | (Raw Nav, Kongsberg 14208, img#17) (B) |
| 14-Apr-2023 | 00:37:58 | 2102 | ECR_ENV_10 | | | camera | 76 | 526875 | 6427545 | 526894 | 6427550 | -20 | -5 | 20 | 77 | PL | (Raw Nav, Kongsberg 14208, img#18) (B) |
| 14-Apr-2023 | 00:38:06 | 2103 | ECR_ENV_10 | | | camera | 76 | 526879 | 6427550 | 526894 | 6427550 | -16 | 0 | 15 | 92 | PL | (Raw Nav, Kongsberg 14208, img#19) (B) |
| 14-Apr-2023 | 00:38:25 | 2104 | ECR_ENV_10 | | | camera | 76 | 526883 | 6427548 | 526894 | 6427550 | -12 | -2 | 12 | 82 | PL | (Raw Nav, Kongsberg 14208, img#20) (B) |
| 14-Apr-2023 | 00:38:31 | 2105 | ECR_ENV_10 | | | camera | 76 | 526884 | 6427551 | 526894 | 6427550 | -11 | 1 | 11 | 98 | PL | (Raw Nav, Kongsberg 14208, img#21) (B) |
| 14-Apr-2023 | 00:38:46 | 2106 | ECR_ENV_10 | | | camera | 76 | 526887 | 6427549 | 526894 | 6427550 | -7 | -1 | 7 | 86 | PL | (Raw Nav, Kongsberg 14208, img#22) (B) |
| 14-Apr-2023 | 00:38:53 | 2107 | ECR_ENV_10 | | | camera | 76 | 526890 | 6427549 | 526894 | 6427550 | -4 | -1 | 4 | 83 | PL | (Raw Nav, Kongsberg 14208, img#23) (B) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | | Vertical / Tidal Datum | VORF, LAT | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 14-Apr-2023 | 00:39:26 | 2108 | ECR_ENV_10 | | | camera | 77 | 526896 | 6427549 | 526894 | 6427550 | 2 | -1 | 2 | -71 | PL | (Raw Nav, Kongsberg 14208, img#24) (B) |
| 14-Apr-2023 | 00:39:40 | 2109 | ECR_ENV_10 | | | camera | 76 | 526899 | 6427549 | 526894 | 6427550 | 5 | -1 | 5 | -83 | PL | (Raw Nav, Kongsberg 14208, img#25) (B) |
| 14-Apr-2023 | 00:39:48 | 2110 | ECR_ENV_10 | | | camera | 77 | 526899 | 6427547 | 526894 | 6427550 | 5 | -3 | 5 | -61 | PL | (Raw Nav, Kongsberg 14208, img#26) (B) |
| 14-Apr-2023 | 00:40:20 | 2111 | ECR_ENV_10 | | | camera | 77 | 526909 | 6427547 | 526894 | 6427550 | 15 | -3 | 15 | -80 | PL | (Raw Nav, Kongsberg 14208, img#27) (B) |
| 14-Apr-2023 | 00:40:39 | 2112 | ECR_ENV_10 | | | camera | 76 | 526911 | 6427545 | 526894 | 6427550 | 17 | -5 | 17 | -75 | PL | (Raw Nav, Kongsberg 14208, img#28) (B) |
| 14-Apr-2023 | 00:40:53 | 2113 | ECR_ENV_10 | | | camera | 77 | 526917 | 6427549 | 526894 | 6427550 | 23 | -1 | 23 | -89 | PL | (Raw Nav, Kongsberg 14208, img#29) (B) |
| 14-Apr-2023 | 00:41:07 | 2114 | ECR_ENV_10 | | | camera | 76 | 526919 | 6427550 | 526894 | 6427550 | 25 | 0 | 25 | -91 | PL | (Raw Nav, Kongsberg 14208, img#30) (B) |
| 14-Apr-2023 | 00:41:27 | 2115 | ECR_ENV_10 | | | camera | 77 | 526922 | 6427550 | 526894 | 6427550 | 28 | 0 | 28 | -91 | PL | (Raw Nav, Kongsberg 14208, img#31) (B) |
| 14-Apr-2023 | 00:41:41 | 2116 | ECR_ENV_10 | | | camera | 76 | 526923 | 6427549 | 526894 | 6427550 | 29 | -1 | 29 | -89 | PL | (Raw Nav, Kongsberg 14208, img#32) (B) |
| 14-Apr-2023 | 00:41:54 | 2117 | ECR_ENV_10 | | | camera | 76 | 526926 | 6427550 | 526894 | 6427550 | 32 | 0 | 32 | -91 | PL | (Raw Nav, Kongsberg 14208, img#33) (B) |
| 14-Apr-2023 | 00:42:01 | 2118 | ECR_ENV_10 | | | camera | 76 | 526928 | 6427549 | 526894 | 6427550 | 34 | -1 | 34 | -89 | PL | (Raw Nav, Kongsberg 14208, img#34) (B) |
| 14-Apr-2023 | 00:42:10 | 2119 | ECR_ENV_10 | | | camera | 76 | 526928 | 6427548 | 526894 | 6427550 | 34 | -2 | 34 | -87 | PL | (Raw Nav, Kongsberg 14208, img#35) (B) |
| 14-Apr-2023 | 00:42:24 | 2120 | ECR_ENV_10 | | | camera | 77 | 526929 | 6427545 | 526894 | 6427550 | 35 | -5 | 35 | -83 | PL | (Raw Nav, Kongsberg 14208, img#36) (B) |
| 14-Apr-2023 | 00:42:31 | 2121 | ECR_ENV_10 | | | camera | 76 | 526935 | 6427549 | 526894 | 6427550 | 41 | -1 | 41 | -89 | PL | (Raw Nav, Kongsberg 14208, img#37) (B) |
| 14-Apr-2023 | 00:43:04 | 2122 | ECR_ENV_10 | | | camera | 77 | 526940 | 6427546 | 526894 | 6427550 | 46 | -4 | 46 | -86 | PL | (Raw Nav, Kongsberg 14208, img#38) (B) |
| 14-Apr-2023 | 00:43:16 | 2123 | ECR_ENV_10 | | | camera | 77 | 526946 | 6427551 | 526894 | 6427550 | 52 | 1 | 52 | -92 | PL | (Raw Nav, Kongsberg 14208, img#39) (B) |
| 14-Apr-2023 | 01:20:21 | 2124 | ECR_ENV_10A | | | camera | 76 | 526843 | 6427539 | 526894 | 6427550 | -52 | -10 | 53 | 79 | PL | (Corr'd Nav, Kongsberg 14208, img#1) (B) (T.A) |
| 14-Apr-2023 | 01:21:03 | 2125 | ECR_ENV_10A | | | camera | 76 | 526845 | 6427546 | 526894 | 6427550 | -49 | -3 | 50 | 86 | PL | (Corr'd Nav, Kongsberg 14208, img#2) (B) (T.A) |
| 14-Apr-2023 | 01:21:17 | 2126 | ECR_ENV_10A | | | camera | 76 | 526845 | 6427548 | 526894 | 6427550 | -49 | -2 | 49 | 88 | PL | (Corr'd Nav, Kongsberg 14208, img#3) (B) (T.A) |
| 14-Apr-2023 | 01:22:00 | 2127 | ECR_ENV_10A | | | camera | 76 | 526847 | 6427550 | 526894 | 6427550 | -47 | 0 | 47 | 90 | PL | (Corr'd Nav, Kongsberg 14208, img#4) (B) (T.A) |
| 14-Apr-2023 | 01:22:15 | 2128 | ECR_ENV_10A | | | camera | 76 | 526851 | 6427549 | 526894 | 6427550 | -43 | 0 | 43 | 90 | PL | (Corr'd Nav, Kongsberg 14208, img#5) (B) (T.A) |
| 14-Apr-2023 | 01:22:27 | 2129 | ECR_ENV_10A | | | camera | 76 | 526851 | 6427547 | 526894 | 6427550 | -44 | -3 | 44 | 86 | PL | (Corr'd Nav, Kongsberg 14208, img#6) (B) (T.A) |
| 14-Apr-2023 | 01:23:03 | 2130 | ECR_ENV_10A | | | camera | 76 | 526857 | 6427553 | 526894 | 6427550 | -37 | 3 | 37 | 95 | PL | (Corr'd Nav, Kongsberg 14208, img#7) (B) (T.A) |
| 14-Apr-2023 | 01:23:11 | 2131 | ECR_ENV_10A | | | camera | 76 | 526858 | 6427552 | 526894 | 6427550 | -36 | 2 | 36 | 93 | PL | (Corr'd Nav, Kongsberg 14208, img#8) (B) (T.A) |
| 14-Apr-2023 | 01:23:18 | 2132 | ECR_ENV_10A | | | camera | 76 | 526859 | 6427553 | 526894 | 6427550 | -35 | 4 | 35 | 96 | PL | (Corr'd Nav, Kongsberg 14208, img#9) (B) (T.A) |
| 14-Apr-2023 | 01:23:58 | 2133 | ECR_ENV_10A | | | camera | 76 | 526867 | 6427554 | 526894 | 6427550 | -27 | 4 | 28 | 99 | PL | (Corr'd Nav, Kongsberg 14208, img#10) (B) (T.A) |
| 14-Apr-2023 | 01:24:30 | 2134 | ECR_ENV_10A | | | camera | 76 | 526875 | 6427554 | 526894 | 6427550 | -20 | 4 | 20 | 102 | PL | (Corr'd Nav, Kongsberg 14208, img#11) (B) (T.A) |
| 14-Apr-2023 | 01:24:37 | 2135 | ECR_ENV_10A | | | camera | 76 | 526875 | 6427554 | 526894 | 6427550 | -20 | 5 | 20 | 103 | PL | (Corr'd Nav, Kongsberg 14208, img#12) (B) (T.A) |
| 14-Apr-2023 | 01:25:03 | 2136 | ECR_ENV_10A | | | camera | 76 | 526877 | 6427552 | 526894 | 6427550 | -17 | 2 | 17 | 98 | PL | (Corr'd Nav, Kongsberg 14208, img#13) (B) (T.A) |
| 14-Apr-2023 | 01:25:20 | 2137 | ECR_ENV_10A | | | camera | 76 | 526881 | 6427554 | 526894 | 6427550 | -14 | 5 | 15 | 110 | PL | (Corr'd Nav, Kongsberg 14208, img#14) (B) (T.A) |
| 14-Apr-2023 | 01:25:28 | 2138 | ECR_ENV_10A | | | camera | 76 | 526882 | 6427551 | 526894 | 6427550 | -13 | 1 | 13 | 96 | PL | (Corr'd Nav, Kongsberg 14208, img#15) (B) (T.A) |
| 14-Apr-2023 | 01:25:45 | 2139 | ECR_ENV_10A | | | camera | 76 | 526885 | 6427550 | 526894 | 6427550 | -9 | 0 | 9 | 90 | PL | (Corr'd Nav, Kongsberg 14208, img#16) (B) (T.A) # No photo taken |
| 14-Apr-2023 | 01:26:05 | 2140 | ECR_ENV_10A | | | camera | 76 | 526890 | 6427550 | 526894 | 6427550 | -5 | 0 | 5 | 93 | PL | (Corr'd Nav, Kongsberg 14208, img#17) (B) (T.A) |
| 14-Apr-2023 | 01:26:19 | 2141 | ECR_ENV_10A | | | camera | 76 | 526893 | 6427550 | 526894 | 6427550 | -1 | 1 | 1 | 134 | PL | (Corr'd Nav, Kongsberg 14208, img#18) (B) (T.A) |
| 14-Apr-2023 | 01:26:25 | 2142 | ECR_ENV_10A | | | camera | 76 | 526895 | 6427550 | 526894 | 6427550 | 1 | 1 | 1 | -147 | PL | (Corr'd Nav, Kongsberg 14208, img#19) (B) (T.A) |
| 14-Apr-2023 | 01:26:37 | 2143 | ECR_ENV_10A | | | camera | 76 | 526898 | 6427550 | 526894 | 6427550 | 4 | 1 | 4 | -102 | PL | (Corr'd Nav, Kongsberg 14208, img#20) (B) (T.A) |
| 14-Apr-2023 | 01:26:46 | 2144 | ECR_ENV_10A | | | camera | 76 | 526900 | 6427550 | 526894 | 6427550 | 5 | 0 | 5 | -93 | PL | (Corr'd Nav, Kongsberg 14208, img#21) (B) (T.A) |
| 14-Apr-2023 | 01:26:50 | 2145 | ECR_ENV_10A | | | camera | 76 | 526901 | 6427550 | 526894 | 6427550 | 7 | 1 | 7 | -97 | PL | (Corr'd Nav, Kongsberg 14208, img#22) (B) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | | Vertical / Tidal Datum | VORF, LAT | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 14-Apr-2023 | 01:27:00 | 2146 | ECR_ENV_10A | | | camera | 76 | 526903 | 6427552 | 526894 | 6427550 | 9 | 2 | 9 | -105 | PL | (Corr'd Nav, Kongsberg 14208, img#23) (B) (T.A) |
| 14-Apr-2023 | 01:27:09 | 2147 | ECR_ENV_10A | | | camera | 76 | 526906 | 6427552 | 526894 | 6427550 | 11 | 2 | 12 | -100 | PL | (Corr'd Nav, Kongsberg 14208, img#24) (B) (T.A) |
| 14-Apr-2023 | 01:27:17 | 2148 | ECR_ENV_10A | | | camera | 76 | 526905 | 6427550 | 526894 | 6427550 | 11 | 0 | 11 | -91 | PL | (Corr'd Nav, Kongsberg 14208, img#25) (B) (T.A) |
| 14-Apr-2023 | 01:27:24 | 2149 | ECR_ENV_10A | | | camera | 76 | 526908 | 6427551 | 526894 | 6427550 | 14 | 2 | 14 | -97 | PL | (Corr'd Nav, Kongsberg 14208, img#26) (B) (T.A) |
| 14-Apr-2023 | 01:27:38 | 2150 | ECR_ENV_10A | | | camera | 76 | 526912 | 6427553 | 526894 | 6427550 | 18 | 4 | 18 | -102 | PL | (Corr'd Nav, Kongsberg 14208, img#27) (B) (T.A) |
| 14-Apr-2023 | 01:27:46 | 2151 | ECR_ENV_10A | | | camera | 76 | 526912 | 6427551 | 526894 | 6427550 | 18 | 2 | 18 | -96 | PL | (Corr'd Nav, Kongsberg 14208, img#28) (B) (T.A) |
| 14-Apr-2023 | 01:28:00 | 2152 | ECR_ENV_10A | | | camera | 76 | 526917 | 6427554 | 526894 | 6427550 | 23 | 4 | 23 | -100 | PL | (Corr'd Nav, Kongsberg 14208, img#29) (B) (T.A) |
| 14-Apr-2023 | 01:28:05 | 2153 | ECR_ENV_10A | | | camera | 76 | 526918 | 6427553 | 526894 | 6427550 | 23 | 3 | 23 | -98 | PL | (Corr'd Nav, Kongsberg 14208, img#30) (B) (T.A) |
| 14-Apr-2023 | 01:28:18 | 2154 | ECR_ENV_10A | | | camera | 76 | 526921 | 6427553 | 526894 | 6427550 | 27 | 4 | 27 | -98 | PL | (Corr'd Nav, Kongsberg 14208, img#31) (B) (T.A) |
| 14-Apr-2023 | 01:28:33 | 2155 | ECR_ENV_10A | | | camera | 76 | 526926 | 6427553 | 526894 | 6427550 | 32 | 4 | 32 | -97 | PL | (Corr'd Nav, Kongsberg 14208, img#32) (B) (T.A) |
| 14-Apr-2023 | 01:28:41 | 2156 | ECR_ENV_10A | | | camera | 76 | 526925 | 6427554 | 526894 | 6427550 | 31 | 4 | 31 | -98 | PL | (Corr'd Nav, Kongsberg 14208, img#33) (B) (T.A) |
| 14-Apr-2023 | 01:28:49 | 2157 | ECR_ENV_10A | | | camera | 76 | 526926 | 6427553 | 526894 | 6427550 | 31 | 3 | 31 | -96 | PL | (Corr'd Nav, Kongsberg 14208, img#34) (B) (T.A) |
| 14-Apr-2023 | 01:29:09 | 2158 | ECR_ENV_10A | | | camera | 76 | 526930 | 6427554 | 526894 | 6427550 | 36 | 5 | 36 | -98 | PL | (Corr'd Nav, Kongsberg 14208, img#35) (B) (T.A) |
| 14-Apr-2023 | 01:29:26 | 2159 | ECR_ENV_10A | | | camera | 76 | 526931 | 6427551 | 526894 | 6427550 | 37 | 2 | 37 | -93 | PL | (Corr'd Nav, Kongsberg 14208, img#36) (B) (T.A) |
| 14-Apr-2023 | 01:29:48 | 2160 | ECR_ENV_10A | | | camera | 76 | 526932 | 6427545 | 526894 | 6427550 | 37 | -4 | 37 | -83 | PL | (Corr'd Nav, Kongsberg 14208, img#37) (B) (T.A) |
| 14-Apr-2023 | 01:30:07 | 2161 | ECR_ENV_10A | | | camera | 76 | 526938 | 6427547 | 526894 | 6427550 | 44 | -2 | 44 | -87 | PL | (Corr'd Nav, Kongsberg 14208, img#38) (B) (T.A) |
| 14-Apr-2023 | 01:30:40 | 2162 | ECR_ENV_10A | | | camera | 76 | 526944 | 6427549 | 526894 | 6427550 | 50 | 0 | 50 | -90 | PL | (Corr'd Nav, Kongsberg 14208, img#39) (B) (T.A) |
| 14-Apr-2023 | 01:30:46 | 2163 | ECR_ENV_10A | | | camera | 76 | 526946 | 6427549 | 526894 | 6427550 | 52 | 0 | 52 | -89 | PL | (Corr'd Nav, Kongsberg 14208, img#40) (B) (T.A) |
| 14-Apr-2023 | 05:07:38 | 2164 | ECR_ENV_31 | | | camera | 72 | 529092 | 6429261 | 529151 | 6429215 | -58 | 46 | 74 | 128 | PL | (Corr'd Nav, Kongsberg 14208, img#41) (B) (T.A) |
| 14-Apr-2023 | 05:08:01 | 2165 | ECR_ENV_31 | | | camera | 73 | 529093 | 6429258 | 529151 | 6429215 | -58 | 42 | 72 | 126 | PL | (Corr'd Nav, Kongsberg 14208, img#2) (B) (T.A) |
| 14-Apr-2023 | 05:09:15 | 2166 | ECR_ENV_31 | | | camera | 73 | 529100 | 6429245 | 529151 | 6429215 | -51 | 30 | 59 | 120 | PL | (Corr'd Nav, Kongsberg 14208, img#3) (B) (T.A) |
| 14-Apr-2023 | 05:09:42 | 2167 | ECR_ENV_31 | | | camera | 73 | 529106 | 6429247 | 529151 | 6429215 | -45 | 31 | 55 | 125 | PL | (Corr'd Nav, Kongsberg 14208, img#4) (B) (T.A) |
| 14-Apr-2023 | 05:10:03 | 2168 | ECR_ENV_31 | | | camera | 73 | 529109 | 6429244 | 529151 | 6429215 | -42 | 28 | 50 | 124 | PL | (Corr'd Nav, Kongsberg 14208, img#5) (B) (T.A) |
| 14-Apr-2023 | 05:10:14 | 2169 | ECR_ENV_31 | | | camera | 73 | 529108 | 6429239 | 529151 | 6429215 | -42 | 24 | 49 | 120 | PL | (Corr'd Nav, Kongsberg 14208, img#6) (B) (T.A) |
| 14-Apr-2023 | 05:10:28 | 2170 | ECR_ENV_31 | | | camera | 73 | 529114 | 6429241 | 529151 | 6429215 | -36 | 25 | 44 | 125 | PL | (Corr'd Nav, Kongsberg 14208, img#7) (B) (T.A) |
| 14-Apr-2023 | 05:10:56 | 2171 | ECR_ENV_31 | | | camera | 73 | 529118 | 6429236 | 529151 | 6429215 | -33 | 20 | 39 | 122 | PL | (Corr'd Nav, Kongsberg 14208, img#8) (B) (T.A) |
| 14-Apr-2023 | 05:11:22 | 2172 | ECR_ENV_31 | | | camera | 73 | 529121 | 6429235 | 529151 | 6429215 | -30 | 20 | 35 | 124 | PL | (Corr'd Nav, Kongsberg 14208, img#9) (B) (T.A) |
| 14-Apr-2023 | 05:11:31 | 2173 | ECR_ENV_31 | | | camera | 73 | 529123 | 6429234 | 529151 | 6429215 | -27 | 19 | 33 | 125 | PL | (Corr'd Nav, Kongsberg 14208, img#10) (B) (T.A) |
| 14-Apr-2023 | 05:11:39 | 2174 | ECR_ENV_31 | | | camera | 73 | 529124 | 6429233 | 529151 | 6429215 | -26 | 17 | 32 | 123 | PL | (Corr'd Nav, Kongsberg 14208, img#11) (B) (T.A) |
| 14-Apr-2023 | 05:11:46 | 2175 | ECR_ENV_31 | | | camera | 73 | 529125 | 6429232 | 529151 | 6429215 | -26 | 17 | 31 | 124 | PL | (Corr'd Nav, Kongsberg 14208, img#12) (B) (T.A) |
| 14-Apr-2023 | 05:11:57 | 2176 | ECR_ENV_31 | | | camera | 73 | 529125 | 6429229 | 529151 | 6429215 | -26 | 14 | 29 | 118 | PL | (Corr'd Nav, Kongsberg 14208, img#13) (B) (T.A) |
| 14-Apr-2023 | 05:12:13 | 2177 | ECR_ENV_31 | | | camera | 73 | 529132 | 6429231 | 529151 | 6429215 | -19 | 15 | 24 | 129 | PL | (Corr'd Nav, Kongsberg 14208, img#14) (B) (T.A) |
| 14-Apr-2023 | 05:12:19 | 2178 | ECR_ENV_31 | | | camera | 73 | 529131 | 6429230 | 529151 | 6429215 | -20 | 15 | 24 | 127 | PL | (Corr'd Nav, Kongsberg 14208, img#15) (B) (T.A) |
| 14-Apr-2023 | 05:12:26 | 2179 | ECR_ENV_31 | | | camera | 73 | 529133 | 6429229 | 529151 | 6429215 | -18 | 14 | 22 | 128 | PL | (Corr'd Nav, Kongsberg 14208, img#16) (B) (T.A) |
| 14-Apr-2023 | 05:12:40 | 2180 | ECR_ENV_31 | | | camera | 73 | 529133 | 6429229 | 529151 | 6429215 | -18 | 14 | 23 | 127 | PL | (Corr'd Nav, Kongsberg 14208, img#17) (B) (T.A) |
| 14-Apr-2023 | 05:12:56 | 2181 | ECR_ENV_31 | | | camera | 73 | 529134 | 6429227 | 529151 | 6429215 | -17 | 11 | 20 | 125 | PL | (Corr'd Nav, Kongsberg 14208, img#18) (B) (T.A) |
| 14-Apr-2023 | 05:13:05 | 2182 | ECR_ENV_31 | | | camera | 73 | 529136 | 6429226 | 529151 | 6429215 | -15 | 10 | 18 | 124 | PL | (Corr'd Nav, Kongsberg 14208, img#19) (B) (T.A) |
| 14-Apr-2023 | 05:13:30 | 2183 | ECR_ENV_31 | | | camera | 73 | 529138 | 6429223 | 529151 | 6429215 | -13 | 8 | 15 | 120 | PL | (Corr'd Nav, Kongsberg 14208, img#20) (B) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 14-Apr-2023 | 05:13:44 | 2184 | ECR_ENV_31 | | | camera | 73 | 529136 | 6429217 | 529151 | 6429215 | -15 | 1 | 15 | 96 | PL | (Corr'd Nav, Kongsberg 14208, img#21) (B) (T.A) |
| 14-Apr-2023 | 05:14:19 | 2185 | ECR_ENV_31 | | | camera | 73 | 529143 | 6429215 | 529151 | 6429215 | -7 | 0 | 7 | 90 | PL | (Corr'd Nav, Kongsberg 14208, img#22) (B) (T.A) |
| 14-Apr-2023 | 05:14:26 | 2186 | ECR_ENV_31 | | | camera | 73 | 529142 | 6429216 | 529151 | 6429215 | -9 | 1 | 9 | 96 | PL | (Corr'd Nav, Kongsberg 14208, img#23) (B) (T.A) |
| 14-Apr-2023 | 05:15:07 | 2187 | ECR_ENV_31 | | | camera | 73 | 529145 | 6429210 | 529151 | 6429215 | -6 | -5 | 7 | 49 | PL | (Corr'd Nav, Kongsberg 14208, img#24) (B) (T.A) |
| 14-Apr-2023 | 05:15:17 | 2188 | ECR_ENV_31 | | | camera | 73 | 529147 | 6429209 | 529151 | 6429215 | -4 | -6 | 7 | 33 | PL | (Corr'd Nav, Kongsberg 14208, img#25) (B) (T.A) |
| 14-Apr-2023 | 05:15:35 | 2189 | ECR_ENV_31 | | | camera | 73 | 529150 | 6429208 | 529151 | 6429215 | -1 | -8 | 8 | 6 | PL | (Corr'd Nav, Kongsberg 14208, img#26) (B) (T.A) |
| 14-Apr-2023 | 05:15:54 | 2190 | ECR_ENV_31 | | | camera | 73 | 529151 | 6429203 | 529151 | 6429215 | 0 | -13 | 12 | 1 | PL | (Corr'd Nav, Kongsberg 14208, img#27) (B) (T.A) |
| 14-Apr-2023 | 05:16:09 | 2191 | ECR_ENV_31 | | | camera | 73 | 529154 | 6429203 | 529151 | 6429215 | 3 | -12 | 13 | -14 | PL | (Corr'd Nav, Kongsberg 14208, img#28) (B) (T.A) |
| 14-Apr-2023 | 05:16:28 | 2192 | ECR_ENV_31 | | | camera | 73 | 529156 | 6429203 | 529151 | 6429215 | 5 | -13 | 14 | -23 | PL | (Corr'd Nav, Kongsberg 14208, img#29) (B) (T.A) |
| 14-Apr-2023 | 05:16:52 | 2193 | ECR_ENV_31 | | | camera | 74 | 529160 | 6429199 | 529151 | 6429215 | 9 | -17 | 19 | -29 | PL | (Corr'd Nav, Kongsberg 14208, img#30) (B) (T.A) |
| 14-Apr-2023 | 05:17:05 | 2194 | ECR_ENV_31 | | | camera | 73 | 529162 | 6429199 | 529151 | 6429215 | 11 | -17 | 20 | -34 | PL | (Corr'd Nav, Kongsberg 14208, img#31) (B) (T.A) |
| 14-Apr-2023 | 05:17:44 | 2195 | ECR_ENV_31 | | | camera | 73 | 529168 | 6429194 | 529151 | 6429215 | 17 | -22 | 28 | -39 | PL | (Corr'd Nav, Kongsberg 14208, img#32) (B) (T.A) |
| 14-Apr-2023 | 05:17:50 | 2196 | ECR_ENV_31 | | | camera | 73 | 529166 | 6429188 | 529151 | 6429215 | 16 | -28 | 32 | -30 | PL | (Corr'd Nav, Kongsberg 14208, img#33) (B) (T.A) |
| 14-Apr-2023 | 05:18:14 | 2197 | ECR_ENV_31 | | | camera | 74 | 529170 | 6429187 | 529151 | 6429215 | 19 | -28 | 34 | -34 | PL | (Corr'd Nav, Kongsberg 14208, img#34) (B) (T.A) |
| 14-Apr-2023 | 05:18:29 | 2198 | ECR_ENV_31 | | | camera | 74 | 529171 | 6429188 | 529151 | 6429215 | 20 | -28 | 34 | -36 | PL | (Corr'd Nav, Kongsberg 14208, img#35) (B) (T.A) |
| 14-Apr-2023 | 05:18:42 | 2199 | ECR_ENV_31 | | | camera | 74 | 529172 | 6429187 | 529151 | 6429215 | 21 | -28 | 35 | -36 | PL | (Corr'd Nav, Kongsberg 14208, img#36) (B) (T.A) |
| 14-Apr-2023 | 05:18:50 | 2200 | ECR_ENV_31 | | | camera | 74 | 529172 | 6429184 | 529151 | 6429215 | 21 | -31 | 38 | -34 | PL | (Corr'd Nav, Kongsberg 14208, img#37) (B) (T.A) |
| 14-Apr-2023 | 05:19:04 | 2201 | ECR_ENV_31 | | | camera | 74 | 529173 | 6429183 | 529151 | 6429215 | 23 | -33 | 40 | -35 | PL | (Corr'd Nav, Kongsberg 14208, img#38) (B) (T.A) |
| 14-Apr-2023 | 05:19:16 | 2202 | ECR_ENV_31 | | | camera | 74 | 529175 | 6429181 | 529151 | 6429215 | 25 | -35 | 42 | -36 | PL | (Corr'd Nav, Kongsberg 14208, img#39) (B) (T.A) |
| 14-Apr-2023 | 05:19:30 | 2203 | ECR_ENV_31 | | | camera | 74 | 529174 | 6429175 | 529151 | 6429215 | 23 | -41 | 47 | -30 | PL | (Corr'd Nav, Kongsberg 14208, img#40) (B) (T.A) |
| 14-Apr-2023 | 07:44:07 | 2204 | ECR_ENV_34 | | | camera | 73 | 526343 | 6430532 | 526390 | 6430516 | -47 | 16 | 50 | 108 | PL | (Corr'd Nav, Kongsberg 14208, img#1) (B) (T.A) |
| 14-Apr-2023 | 07:44:51 | 2205 | ECR_ENV_34 | | | camera | 73 | 526340 | 6430527 | 526390 | 6430516 | -50 | 10 | 51 | 101 | PL | (Corr'd Nav, Kongsberg 14208, img#2) (B) (T.A) |
| 14-Apr-2023 | 07:45:08 | 2206 | ECR_ENV_34 | | | camera | 73 | 526338 | 6430525 | 526390 | 6430516 | -53 | 8 | 53 | 99 | PL | (Corr'd Nav, Kongsberg 14208, img#3) (B) (T.A) |
| 14-Apr-2023 | 07:45:16 | 2207 | ECR_ENV_34 | | | camera | 73 | 526337 | 6430523 | 526390 | 6430516 | -54 | 7 | 54 | 97 | PL | (Corr'd Nav, Kongsberg 14208, img#4) (B) (T.A) |
| 14-Apr-2023 | 07:45:45 | 2208 | ECR_ENV_34 | | | camera | 73 | 526335 | 6430518 | 526390 | 6430516 | -56 | 2 | 56 | 92 | PL | (Corr'd Nav, Kongsberg 14208, img#5) (B) (T.A) |
| 14-Apr-2023 | 07:45:52 | 2209 | ECR_ENV_34 | | | camera | 73 | 526335 | 6430518 | 526390 | 6430516 | -55 | 2 | 55 | 92 | PL | (Corr'd Nav, Kongsberg 14208, img#6) (B) (T.A) |
| 14-Apr-2023 | 07:46:33 | 2210 | ECR_ENV_34 | | | camera | 73 | 526341 | 6430517 | 526390 | 6430516 | -49 | 0 | 49 | 90 | PL | (Corr'd Nav, Kongsberg 14208, img#7) (B) (T.A) |
| 14-Apr-2023 | 07:46:48 | 2211 | ECR_ENV_34 | | | camera | 73 | 526343 | 6430515 | 526390 | 6430516 | -47 | -2 | 47 | 88 | PL | (Corr'd Nav, Kongsberg 14208, img#8) (B) (T.A) |
| 14-Apr-2023 | 07:47:26 | 2212 | ECR_ENV_34 | | | camera | 73 | 526348 | 6430514 | 526390 | 6430516 | -43 | -2 | 43 | 87 | PL | (Corr'd Nav, Kongsberg 14208, img#9) (B) (T.A) |
| 14-Apr-2023 | 07:47:41 | 2213 | ECR_ENV_34 | | | camera | 73 | 526351 | 6430514 | 526390 | 6430516 | -40 | -3 | 40 | 86 | PL | (Corr'd Nav, Kongsberg 14208, img#10) (B) (T.A) |
| 14-Apr-2023 | 07:47:58 | 2214 | ECR_ENV_34 | | | camera | 73 | 526353 | 6430512 | 526390 | 6430516 | -37 | -4 | 37 | 84 | PL | (Corr'd Nav, Kongsberg 14208, img#11) (B) (T.A) |
| 14-Apr-2023 | 07:48:12 | 2215 | ECR_ENV_34 | | | camera | 73 | 526355 | 6430513 | 526390 | 6430516 | -35 | -4 | 35 | 84 | PL | (Corr'd Nav, Kongsberg 14208, img#12) (B) (T.A) |
| 14-Apr-2023 | 07:48:35 | 2216 | ECR_ENV_34 | | | camera | 74 | 526359 | 6430512 | 526390 | 6430516 | -31 | -4 | 31 | 82 | PL | (Corr'd Nav, Kongsberg 14208, img#13) (B) (T.A) |
| 14-Apr-2023 | 07:48:54 | 2217 | ECR_ENV_34 | | | camera | 73 | 526363 | 6430514 | 526390 | 6430516 | -27 | -2 | 27 | 85 | PL | (Corr'd Nav, Kongsberg 14208, img#14) (B) (T.A) |
| 14-Apr-2023 | 07:49:08 | 2218 | ECR_ENV_34 | | | camera | 73 | 526365 | 6430514 | 526390 | 6430516 | -26 | -3 | 26 | 84 | PL | (Corr'd Nav, Kongsberg 14208, img#15) (B) (T.A) |
| 14-Apr-2023 | 07:49:23 | 2219 | ECR_ENV_34 | | | camera | 73 | 526368 | 6430511 | 526390 | 6430516 | -23 | -5 | 23 | 77 | PL | (Corr'd Nav, Kongsberg 14208, img#16) (B) (T.A) |
| 14-Apr-2023 | 07:49:37 | 2220 | ECR_ENV_34 | | | camera | 73 | 526370 | 6430514 | 526390 | 6430516 | -21 | -3 | 21 | 82 | PL | (Corr'd Nav, Kongsberg 14208, img#17) (B) (T.A) |
| 14-Apr-2023 | 07:49:49 | 2221 | ECR_ENV_34 | | | camera | 73 | 526371 | 6430516 | 526390 | 6430516 | -20 | 0 | 20 | 89 | PL | (Corr'd Nav, Kongsberg 14208, img#18) (B) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 14-Apr-2023 | 07:49:56 | 2222 | ECR_ENV_34 | | | camera | 73 | 526373 | 6430515 | 526390 | 6430516 | -18 | -1 | 18 | 87 | PL | (Corr'd Nav, Kongsberg 14208, img#19) (B) (T.A) |
| 14-Apr-2023 | 07:50:10 | 2223 | ECR_ENV_34 | | | camera | 73 | 526375 | 6430517 | 526390 | 6430516 | -15 | 0 | 15 | 90 | PL | (Corr'd Nav, Kongsberg 14208, img#20) (B) (T.A) |
| 14-Apr-2023 | 07:50:15 | 2224 | ECR_ENV_34 | | | camera | 73 | 526374 | 6430518 | 526390 | 6430516 | -16 | 1 | 16 | 95 | PL | (Corr'd Nav, Kongsberg 14208, img#21) (B) (T.A) |
| 14-Apr-2023 | 07:50:23 | 2225 | ECR_ENV_34 | | | camera | 73 | 526377 | 6430517 | 526390 | 6430516 | -14 | 1 | 14 | 94 | PL | (Corr'd Nav, Kongsberg 14208, img#22) (B) (T.A) |
| 14-Apr-2023 | 07:50:45 | 2226 | ECR_ENV_34 | | | camera | 73 | 526379 | 6430513 | 526390 | 6430516 | -11 | -3 | 12 | 74 | PL | (Corr'd Nav, Kongsberg 14208, img#23) (B) (T.A) |
| 14-Apr-2023 | 07:50:55 | 2227 | ECR_ENV_34 | | | camera | 73 | 526380 | 6430520 | 526390 | 6430516 | -10 | 4 | 11 | 110 | PL | (Corr'd Nav, Kongsberg 14208, img#24) (B) (T.A) |
| 14-Apr-2023 | 07:51:09 | 2228 | ECR_ENV_34 | | | camera | 73 | 526383 | 6430518 | 526390 | 6430516 | -8 | 2 | 8 | 102 | PL | (Corr'd Nav, Kongsberg 14208, img#25) (B) (T.A) |
| 14-Apr-2023 | 07:51:21 | 2229 | ECR_ENV_34 | | | camera | 73 | 526383 | 6430517 | 526390 | 6430516 | -7 | 1 | 7 | 95 | PL | (Corr'd Nav, Kongsberg 14208, img#26) (B) (T.A) |
| 14-Apr-2023 | 07:52:04 | 2230 | ECR_ENV_34 | | | camera | 74 | 526388 | 6430517 | 526390 | 6430516 | -3 | 0 | 3 | 100 | PL | (Corr'd Nav, Kongsberg 14208, img#27) (B) (T.A) |
| 14-Apr-2023 | 07:52:11 | 2231 | ECR_ENV_34 | | | camera | 73 | 526388 | 6430517 | 526390 | 6430516 | -2 | 1 | 2 | 103 | PL | (Corr'd Nav, Kongsberg 14208, img#28) (B) (T.A) |
| 14-Apr-2023 | 07:52:27 | 2232 | ECR_ENV_34 | | | camera | 73 | 526390 | 6430515 | 526390 | 6430516 | -1 | -1 | 2 | 31 | PL | (Corr'd Nav, Kongsberg 14208, img#29) (B) (T.A) |
| 14-Apr-2023 | 07:52:39 | 2233 | ECR_ENV_34 | | | camera | 73 | 526391 | 6430515 | 526390 | 6430516 | 0 | -1 | 1 | -23 | PL | (Corr'd Nav, Kongsberg 14208, img#30) (B) (T.A) |
| 14-Apr-2023 | 07:53:03 | 2234 | ECR_ENV_34 | | | camera | 73 | 526394 | 6430515 | 526390 | 6430516 | 4 | -2 | 4 | -67 | PL | (Corr'd Nav, Kongsberg 14208, img#31) (B) (T.A) |
| 14-Apr-2023 | 07:53:34 | 2235 | ECR_ENV_34 | | | camera | 73 | 526400 | 6430517 | 526390 | 6430516 | 10 | 1 | 10 | -95 | PL | (Corr'd Nav, Kongsberg 14208, img#32) (B) (T.A) |
| 14-Apr-2023 | 07:53:50 | 2236 | ECR_ENV_34 | | | camera | 73 | 526403 | 6430517 | 526390 | 6430516 | 13 | 1 | 13 | -93 | PL | (Corr'd Nav, Kongsberg 14208, img#33) (B) (T.A) |
| 14-Apr-2023 | 07:54:14 | 2237 | ECR_ENV_34 | | | camera | 73 | 526407 | 6430517 | 526390 | 6430516 | 17 | 0 | 17 | -91 | PL | (Corr'd Nav, Kongsberg 14208, img#34) (B) (T.A) |
| 14-Apr-2023 | 07:54:45 | 2238 | ECR_ENV_34 | | | camera | 73 | 526411 | 6430512 | 526390 | 6430516 | 21 | -5 | 22 | -77 | PL | (Corr'd Nav, Kongsberg 14208, img#35) (B) (T.A) |
| 14-Apr-2023 | 07:54:52 | 2239 | ECR_ENV_34 | | | camera | 73 | 526413 | 6430515 | 526390 | 6430516 | 23 | -2 | 23 | -86 | PL | (Corr'd Nav, Kongsberg 14208, img#36) (B) (T.A) |
| 14-Apr-2023 | 07:55:14 | 2240 | ECR_ENV_34 | | | camera | 73 | 526417 | 6430514 | 526390 | 6430516 | 27 | -2 | 27 | -85 | PL | (Corr'd Nav, Kongsberg 14208, img#37) (B) (T.A) |
| 14-Apr-2023 | 07:55:31 | 2241 | ECR_ENV_34 | | | camera | 73 | 526418 | 6430514 | 526390 | 6430516 | 28 | -3 | 28 | -84 | PL | (Corr'd Nav, Kongsberg 14208, img#38) (B) (T.A) |
| 14-Apr-2023 | 07:56:02 | 2242 | ECR_ENV_34 | | | camera | 73 | 526422 | 6430514 | 526390 | 6430516 | 32 | -2 | 32 | -86 | PL | (Corr'd Nav, Kongsberg 14208, img#39) (B) (T.A) |
| 14-Apr-2023 | 07:56:29 | 2243 | ECR_ENV_34 | | | camera | 73 | 526426 | 6430516 | 526390 | 6430516 | 36 | 0 | 36 | -90 | PL | (Corr'd Nav, Kongsberg 14208, img#40) (B) (T.A) |
| 14-Apr-2023 | 07:56:40 | 2244 | ECR_ENV_34 | | | camera | 73 | 526427 | 6430518 | 526390 | 6430516 | 37 | 1 | 37 | -92 | PL | (Corr'd Nav, Kongsberg 14208, img#41) (B) (T.A) |
| 14-Apr-2023 | 07:57:05 | 2245 | ECR_ENV_34 | | | camera | 73 | 526431 | 6430518 | 526390 | 6430516 | 41 | 1 | 41 | -92 | PL | (Corr'd Nav, Kongsberg 14208, img#42) (B) (T.A) |
| 14-Apr-2023 | 07:57:11 | 2246 | ECR_ENV_34 | | | camera | 73 | 526432 | 6430519 | 526390 | 6430516 | 41 | 2 | 41 | -93 | PL | (Corr'd Nav, Kongsberg 14208, img#43) (B) (T.A) |
| 14-Apr-2023 | 07:57:31 | 2247 | ECR_ENV_34 | | | camera | 73 | 526435 | 6430517 | 526390 | 6430516 | 45 | 0 | 45 | -90 | PL | (Corr'd Nav, Kongsberg 14208, img#44) (B) (T.A) |
| 14-Apr-2023 | 07:58:07 | 2248 | ECR_ENV_34 | | | camera | 73 | 526440 | 6430518 | 526390 | 6430516 | 50 | 2 | 50 | -92 | PL | (Corr'd Nav, Kongsberg 14208, img#45) (B) (T.A) |
| 14-Apr-2023 | 09:22:11 | 2249 | ECR_ENV_30 | | | camera | 72 | 527741 | 6431924 | 527788 | 6431898 | -47 | 26 | 54 | 119 | PL | (Corr'd Nav, Kongsberg 14208, img#1) (B) (T.A) |
| 14-Apr-2023 | 09:22:47 | 2250 | ECR_ENV_30 | | | camera | 72 | 527742 | 6431923 | 527788 | 6431898 | -46 | 25 | 52 | 119 | PL | (Corr'd Nav, Kongsberg 14208, img#2) (B) (T.A) |
| 14-Apr-2023 | 09:23:01 | 2251 | ECR_ENV_30 | | | camera | 71 | 527741 | 6431921 | 527788 | 6431898 | -47 | 24 | 52 | 117 | PL | (Corr'd Nav, Kongsberg 14208, img#3) (B) (T.A) |
| 14-Apr-2023 | 09:23:15 | 2252 | ECR_ENV_30 | | | camera | 72 | 527742 | 6431920 | 527788 | 6431898 | -47 | 22 | 51 | 115 | PL | (Corr'd Nav, Kongsberg 14208, img#4) (B) (T.A) |
| 14-Apr-2023 | 09:23:30 | 2253 | ECR_ENV_30 | | | camera | 72 | 527744 | 6431924 | 527788 | 6431898 | -44 | 26 | 51 | 120 | PL | (Corr'd Nav, Kongsberg 14208, img#5) (B) (T.A) |
| 14-Apr-2023 | 09:23:44 | 2254 | ECR_ENV_30 | | | camera | 72 | 527746 | 6431923 | 527788 | 6431898 | -42 | 25 | 49 | 120 | PL | (Corr'd Nav, Kongsberg 14208, img#6) (B) (T.A) |
| 14-Apr-2023 | 09:24:18 | 2255 | ECR_ENV_30 | | | camera | 72 | 527751 | 6431921 | 527788 | 6431898 | -37 | 23 | 43 | 123 | PL | (Corr'd Nav, Kongsberg 14208, img#7) (B) (T.A) |
| 14-Apr-2023 | 09:24:34 | 2256 | ECR_ENV_30 | | | camera | 72 | 527752 | 6431918 | 527788 | 6431898 | -37 | 20 | 42 | 119 | PL | (Corr'd Nav, Kongsberg 14208, img#8) (B) (T.A) |
| 14-Apr-2023 | 09:24:40 | 2257 | ECR_ENV_30 | | | camera | 72 | 527755 | 6431921 | 527788 | 6431898 | -33 | 23 | 40 | 125 | PL | (Corr'd Nav, Kongsberg 14208, img#9) (B) (T.A) |
| 14-Apr-2023 | 09:24:57 | 2258 | ECR_ENV_30 | | | camera | 72 | 527755 | 6431918 | 527788 | 6431898 | -33 | 20 | 38 | 121 | PL | (Corr'd Nav, Kongsberg 14208, img#10) (B) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | | Vertical / Tidal Datum | VORF, LAT | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 14-Apr-2023 | 09:25:03 | 2259 | ECR_ENV_30 | | | camera | 72 | 527759 | 6431920 | 527788 | 6431898 | -29 | 22 | 36 | 127 | PL | (Corr'd Nav, Kongsberg 14208, img#11) (B) (T.A) |
| 14-Apr-2023 | 09:25:23 | 2260 | ECR_ENV_30 | | | camera | 72 | 527759 | 6431918 | 527788 | 6431898 | -29 | 21 | 35 | 126 | PL | (Corr'd Nav, Kongsberg 14208, img#12) (B) (T.A) |
| 14-Apr-2023 | 09:25:37 | 2261 | ECR_ENV_30 | | | camera | 72 | 527764 | 6431919 | 527788 | 6431898 | -24 | 21 | 32 | 131 | PL | (Corr'd Nav, Kongsberg 14208, img#13) (B) (T.A) |
| 14-Apr-2023 | 09:25:43 | 2262 | ECR_ENV_30 | | | camera | 72 | 527765 | 6431919 | 527788 | 6431898 | -23 | 21 | 31 | 132 | PL | (Corr'd Nav, Kongsberg 14208, img#14) (B) (T.A) |
| 14-Apr-2023 | 09:26:21 | 2263 | ECR_ENV_30 | | | camera | 72 | 527769 | 6431916 | 527788 | 6431898 | -19 | 18 | 26 | 134 | PL | (Corr'd Nav, Kongsberg 14208, img#15) (B) (T.A) |
| 14-Apr-2023 | 09:26:47 | 2264 | ECR_ENV_30 | | | camera | 72 | 527770 | 6431916 | 527788 | 6431898 | -18 | 18 | 26 | 135 | PL | (Corr'd Nav, Kongsberg 14208, img#16) (B) (T.A) |
| 14-Apr-2023 | 09:27:27 | 2265 | ECR_ENV_30 | | | camera | 72 | 527772 | 6431913 | 527788 | 6431898 | -16 | 15 | 21 | 133 | PL | (Corr'd Nav, Kongsberg 14208, img#17) (B) (T.A) |
| 14-Apr-2023 | 09:27:33 | 2266 | ECR_ENV_30 | | | camera | 72 | 527772 | 6431912 | 527788 | 6431898 | -16 | 14 | 21 | 131 | PL | (Corr'd Nav, Kongsberg 14208, img#18) (B) (T.A) |
| 14-Apr-2023 | 09:28:32 | 2267 | ECR_ENV_30 | | | camera | 72 | 527775 | 6431910 | 527788 | 6431898 | -13 | 12 | 18 | 131 | PL | (Corr'd Nav, Kongsberg 14208, img#19) (B) (T.A) |
| 14-Apr-2023 | 09:29:02 | 2268 | ECR_ENV_30 | | | camera | 72 | 527774 | 6431906 | 527788 | 6431898 | -14 | 8 | 16 | 119 | PL | (Corr'd Nav, Kongsberg 14208, img#20) (B) (T.A) |
| 14-Apr-2023 | 09:29:28 | 2269 | ECR_ENV_30 | | | camera | 72 | 527778 | 6431905 | 527788 | 6431898 | -10 | 7 | 12 | 124 | PL | (Corr'd Nav, Kongsberg 14208, img#21) (B) (T.A) |
| 14-Apr-2023 | 09:29:53 | 2270 | ECR_ENV_30 | | | camera | 72 | 527780 | 6431904 | 527788 | 6431898 | -8 | 6 | 10 | 125 | PL | (Corr'd Nav, Kongsberg 14208, img#22) (B) (T.A) |
| 14-Apr-2023 | 09:30:44 | 2271 | ECR_ENV_30 | | | camera | 72 | 527785 | 6431900 | 527788 | 6431898 | -3 | 2 | 4 | 124 | PL | (Corr'd Nav, Kongsberg 14208, img#23) (B) (T.A) |
| 14-Apr-2023 | 09:31:27 | 2272 | ECR_ENV_30 | | | camera | 72 | 527789 | 6431897 | 527788 | 6431898 | 1 | -1 | 1 | -58 | PL | (Corr'd Nav, Kongsberg 14208, img#24) (B) (T.A) |
| 14-Apr-2023 | 09:31:40 | 2273 | ECR_ENV_30 | | | camera | 72 | 527790 | 6431897 | 527788 | 6431898 | 2 | -1 | 2 | -74 | PL | (Corr'd Nav, Kongsberg 14208, img#25) (B) (T.A) |
| 14-Apr-2023 | 09:31:47 | 2274 | ECR_ENV_30 | | | camera | 72 | 527792 | 6431896 | 527788 | 6431898 | 4 | -2 | 5 | -60 | PL | (Corr'd Nav, Kongsberg 14208, img#26) (B) (T.A) |
| 14-Apr-2023 | 09:32:17 | 2275 | ECR_ENV_30 | | | camera | 72 | 527795 | 6431894 | 527788 | 6431898 | 7 | -4 | 9 | -60 | PL | (Corr'd Nav, Kongsberg 14208, img#27) (B) (T.A) |
| 14-Apr-2023 | 09:32:24 | 2276 | ECR_ENV_30 | | | camera | 72 | 527796 | 6431893 | 527788 | 6431898 | 8 | -5 | 9 | -59 | PL | (Corr'd Nav, Kongsberg 14208, img#28) (B) (T.A) |
| 14-Apr-2023 | 09:32:53 | 2277 | ECR_ENV_30 | | | camera | 72 | 527799 | 6431891 | 527788 | 6431898 | 11 | -7 | 13 | -58 | PL | (Corr'd Nav, Kongsberg 14208, img#29) (B) (T.A) |
| 14-Apr-2023 | 09:33:10 | 2278 | ECR_ENV_30 | | | camera | 72 | 527801 | 6431889 | 527788 | 6431898 | 13 | -9 | 16 | -53 | PL | (Corr'd Nav, Kongsberg 14208, img#30) (B) (T.A) |
| 14-Apr-2023 | 09:33:17 | 2279 | ECR_ENV_30 | | | camera | 72 | 527801 | 6431888 | 527788 | 6431898 | 13 | -10 | 16 | -53 | PL | (Corr'd Nav, Kongsberg 14208, img#31) (B) (T.A) |
| 14-Apr-2023 | 09:33:25 | 2280 | ECR_ENV_30 | | | camera | 72 | 527802 | 6431888 | 527788 | 6431898 | 14 | -10 | 17 | -54 | PL | (Corr'd Nav, Kongsberg 14208, img#32) (B) (T.A) |
| 14-Apr-2023 | 09:33:49 | 2281 | ECR_ENV_30 | | | camera | 72 | 527803 | 6431886 | 527788 | 6431898 | 15 | -12 | 19 | -52 | PL | (Corr'd Nav, Kongsberg 14208, img#33) (B) (T.A) |
| 14-Apr-2023 | 09:34:04 | 2282 | ECR_ENV_30 | | | camera | 72 | 527804 | 6431884 | 527788 | 6431898 | 16 | -14 | 21 | -50 | PL | (Corr'd Nav, Kongsberg 14208, img#34) (B) (T.A) |
| 14-Apr-2023 | 09:34:11 | 2283 | ECR_ENV_30 | | | camera | 72 | 527804 | 6431882 | 527788 | 6431898 | 16 | -16 | 22 | -45 | PL | (Corr'd Nav, Kongsberg 14208, img#35) (B) (T.A) |
| 14-Apr-2023 | 09:34:27 | 2284 | ECR_ENV_30 | | | camera | 72 | 527805 | 6431883 | 527788 | 6431898 | 17 | -15 | 22 | -48 | PL | (Corr'd Nav, Kongsberg 14208, img#36) (B) (T.A) |
| 14-Apr-2023 | 09:34:40 | 2285 | ECR_ENV_30 | | | camera | 72 | 527807 | 6431882 | 527788 | 6431898 | 19 | -16 | 25 | -50 | PL | (Corr'd Nav, Kongsberg 14208, img#37) (B) (T.A) |
| 14-Apr-2023 | 09:34:52 | 2286 | ECR_ENV_30 | | | camera | 72 | 527809 | 6431881 | 527788 | 6431898 | 21 | -17 | 27 | -51 | PL | (Corr'd Nav, Kongsberg 14208, img#38) (B) (T.A) |
| 14-Apr-2023 | 09:35:45 | 2287 | ECR_ENV_30 | | | camera | 72 | 527813 | 6431878 | 527788 | 6431898 | 26 | -20 | 33 | -51 | PL | (Corr'd Nav, Kongsberg 14208, img#39) (B) (T.A) |
| 14-Apr-2023 | 09:35:52 | 2288 | ECR_ENV_30 | | | camera | 72 | 527813 | 6431876 | 527788 | 6431898 | 25 | -22 | 33 | -49 | PL | (Corr'd Nav, Kongsberg 14208, img#40) (B) (T.A) |
| 14-Apr-2023 | 09:36:14 | 2289 | ECR_ENV_30 | | | camera | 72 | 527813 | 6431873 | 527788 | 6431898 | 25 | -25 | 35 | -45 | PL | (Corr'd Nav, Kongsberg 14208, img#41) (B) (T.A) |
| 14-Apr-2023 | 09:36:22 | 2290 | ECR_ENV_30 | | | camera | 72 | 527817 | 6431874 | 527788 | 6431898 | 29 | -24 | 38 | -51 | PL | (Corr'd Nav, Kongsberg 14208, img#42) (B) (T.A) |
| 14-Apr-2023 | 09:37:00 | 2291 | ECR_ENV_30 | | | camera | 72 | 527817 | 6431873 | 527788 | 6431898 | 29 | -25 | 38 | -50 | PL | (Corr'd Nav, Kongsberg 14208, img#43) (B) (T.A) |
| 14-Apr-2023 | 09:37:28 | 2292 | ECR_ENV_30 | | | camera | 72 | 527821 | 6431869 | 527788 | 6431898 | 34 | -29 | 44 | -49 | PL | (Corr'd Nav, Kongsberg 14208, img#44) (B) (T.A) |
| 14-Apr-2023 | 09:37:35 | 2293 | ECR_ENV_30 | | | camera | 72 | 527821 | 6431868 | 527788 | 6431898 | 33 | -30 | 45 | -47 | PL | (Corr'd Nav, Kongsberg 14208, img#45) (B) (T.A) |
| 14-Apr-2023 | 09:38:24 | 2294 | ECR_ENV_30 | | | camera | 72 | 527826 | 6431864 | 527788 | 6431898 | 39 | -34 | 51 | -49 | PL | (Corr'd Nav, Kongsberg 14208, img#46) (B) (T.A) |
| 14-Apr-2023 | 11:12:36 | 2295 | ECR_ENV_05 | | | camera | 73 | 529689 | 6431972 | 529726 | 6431936 | -38 | 35 | 52 | 133 | PL | (Corr'd Nav, Kongsberg 14208, img#1) (B) (T.A) |
| 14-Apr-2023 | 11:12:50 | 2296 | ECR_ENV_05 | | | camera | 73 | 529690 | 6431972 | 529726 | 6431936 | -36 | 36 | 51 | 135 | PL | (Corr'd Nav, Kongsberg 14208, img#2) (B) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 14-Apr-2023 | 11:13:04 | 2297 | ECR_ENV_05 | | | camera | 73 | 529691 | 6431973 | 529726 | 6431936 | -35 | 37 | 51 | 136 | PL | (Corr'd Nav, Kongsberg 14208, img#3) (B) (T.A) |
| 14-Apr-2023 | 11:13:20 | 2298 | ECR_ENV_05 | | | camera | 73 | 529693 | 6431971 | 529726 | 6431936 | -33 | 35 | 48 | 137 | PL | (Corr'd Nav, Kongsberg 14208, img#4) (B) (T.A) |
| 14-Apr-2023 | 11:13:40 | 2299 | ECR_ENV_05 | | | camera | 73 | 529697 | 6431971 | 529726 | 6431936 | -30 | 35 | 46 | 139 | PL | (Corr'd Nav, Kongsberg 14208, img#5) (B) (T.A) |
| 14-Apr-2023 | 11:13:58 | 2300 | ECR_ENV_05 | | | camera | 73 | 529701 | 6431971 | 529726 | 6431936 | -25 | 34 | 43 | 144 | PL | (Corr'd Nav, Kongsberg 14208, img#6) (B) (T.A) |
| 14-Apr-2023 | 11:14:15 | 2301 | ECR_ENV_05 | | | camera | 73 | 529706 | 6431970 | 529726 | 6431936 | -21 | 34 | 40 | 149 | PL | (Corr'd Nav, Kongsberg 14208, img#7) (B) (T.A) |
| 14-Apr-2023 | 11:14:46 | 2302 | ECR_ENV_05 | | | camera | 73 | 529709 | 6431968 | 529726 | 6431936 | -18 | 32 | 36 | 151 | PL | (Corr'd Nav, Kongsberg 14208, img#8) (B) (T.A) |
| 14-Apr-2023 | 11:15:03 | 2303 | ECR_ENV_05 | | | camera | 73 | 529709 | 6431965 | 529726 | 6431936 | -17 | 29 | 34 | 149 | PL | (Corr'd Nav, Kongsberg 14208, img#9) (B) (T.A) |
| 14-Apr-2023 | 11:15:21 | 2304 | ECR_ENV_05 | | | camera | 73 | 529711 | 6431964 | 529726 | 6431936 | -16 | 28 | 32 | 151 | PL | (Corr'd Nav, Kongsberg 14208, img#10) (B) (T.A) |
| 14-Apr-2023 | 11:15:40 | 2305 | ECR_ENV_05 | | | camera | 73 | 529710 | 6431962 | 529726 | 6431936 | -16 | 26 | 30 | 148 | PL | (Corr'd Nav, Kongsberg 14208, img#11) (B) (T.A) |
| 14-Apr-2023 | 11:16:00 | 2306 | ECR_ENV_05 | | | camera | 73 | 529710 | 6431959 | 529726 | 6431936 | -16 | 23 | 28 | 145 | PL | (Corr'd Nav, Kongsberg 14208, img#12) (B) (T.A) |
| 14-Apr-2023 | 11:16:44 | 2307 | ECR_ENV_05 | | | camera | 73 | 529707 | 6431952 | 529726 | 6431936 | -19 | 15 | 25 | 129 | PL | (Corr'd Nav, Kongsberg 14208, img#13) (B) (T.A) |
| 14-Apr-2023 | 11:16:55 | 2308 | ECR_ENV_05 | | | camera | 73 | 529712 | 6431951 | 529726 | 6431936 | -15 | 15 | 21 | 135 | PL | (Corr'd Nav, Kongsberg 14208, img#14) (B) (T.A) |
| 14-Apr-2023 | 11:17:13 | 2309 | ECR_ENV_05 | | | camera | 73 | 529712 | 6431947 | 529726 | 6431936 | -14 | 10 | 17 | 126 | PL | (Corr'd Nav, Kongsberg 14208, img#15) (B) (T.A) |
| 14-Apr-2023 | 11:17:52 | 2310 | ECR_ENV_05 | | | camera | 73 | 529719 | 6431941 | 529726 | 6431936 | -7 | 5 | 9 | 125 | PL | (Corr'd Nav, Kongsberg 14208, img#16) (B) (T.A) |
| 14-Apr-2023 | 11:18:02 | 2311 | ECR_ENV_05 | | | camera | 73 | 529720 | 6431939 | 529726 | 6431936 | -7 | 3 | 7 | 115 | PL | (Corr'd Nav, Kongsberg 14208, img#17) (B) (T.A) |
| 14-Apr-2023 | 11:18:15 | 2312 | ECR_ENV_05 | | | camera | 73 | 529724 | 6431938 | 529726 | 6431936 | -3 | 2 | 3 | 122 | PL | (Corr'd Nav, Kongsberg 14208, img#18) (B) (T.A) # No photo taken |
| 14-Apr-2023 | 11:18:29 | 2313 | ECR_ENV_05 | | | camera | 73 | 529725 | 6431937 | 529726 | 6431936 | -1 | 1 | 2 | 142 | PL | (Corr'd Nav, Kongsberg 14208, img#19) (B) (T.A) |
| 14-Apr-2023 | 11:18:38 | 2314 | ECR_ENV_05 | | | camera | 74 | 529727 | 6431935 | 529726 | 6431936 | 1 | -1 | 1 | -21 | PL | (Corr'd Nav, Kongsberg 14208, img#20) (B) (T.A) |
| 14-Apr-2023 | 11:18:51 | 2315 | ECR_ENV_05 | | | camera | 73 | 529730 | 6431933 | 529726 | 6431936 | 4 | -3 | 5 | -54 | PL | (Corr'd Nav, Kongsberg 14208, img#21) (B) (T.A) |
| 14-Apr-2023 | 11:19:02 | 2316 | ECR_ENV_05 | | | camera | 73 | 529732 | 6431931 | 529726 | 6431936 | 6 | -5 | 7 | -49 | PL | (Corr'd Nav, Kongsberg 14208, img#22) (B) (T.A) |
| 14-Apr-2023 | 11:19:16 | 2317 | ECR_ENV_05 | | | camera | 73 | 529735 | 6431929 | 529726 | 6431936 | 9 | -7 | 11 | -52 | PL | (Corr'd Nav, Kongsberg 14208, img#23) (B) (T.A) |
| 14-Apr-2023 | 11:19:46 | 2318 | ECR_ENV_05 | | | camera | 73 | 529740 | 6431925 | 529726 | 6431936 | 13 | -11 | 17 | -51 | PL | (Corr'd Nav, Kongsberg 14208, img#24) (B) (T.A) |
| 14-Apr-2023 | 11:20:01 | 2319 | ECR_ENV_05 | | | camera | 73 | 529743 | 6431923 | 529726 | 6431936 | 17 | -14 | 21 | -50 | PL | (Corr'd Nav, Kongsberg 14208, img#25) (B) (T.A) # No photo taken |
| 14-Apr-2023 | 11:20:07 | 2320 | ECR_ENV_05 | | | camera | 73 | 529744 | 6431921 | 529726 | 6431936 | 17 | -15 | 23 | -50 | PL | (Corr'd Nav, Kongsberg 14208, img#26) (B) (T.A) |
| 14-Apr-2023 | 11:20:14 | 2321 | ECR_ENV_05 | | | camera | 73 | 529744 | 6431921 | 529726 | 6431936 | 18 | -15 | 23 | -50 | PL | (Corr'd Nav, Kongsberg 14208, img#27) (B) (T.A) |
| 14-Apr-2023 | 11:20:22 | 2322 | ECR_ENV_05 | | | camera | 73 | 529745 | 6431918 | 529726 | 6431936 | 19 | -18 | 26 | -46 | PL | (Corr'd Nav, Kongsberg 14208, img#28) (B) (T.A) |
| 14-Apr-2023 | 11:20:35 | 2323 | ECR_ENV_05 | | | camera | 73 | 529748 | 6431917 | 529726 | 6431936 | 22 | -19 | 29 | -49 | PL | (Corr'd Nav, Kongsberg 14208, img#29) (B) (T.A) |
| 14-Apr-2023 | 11:20:49 | 2324 | ECR_ENV_05 | | | camera | 73 | 529750 | 6431915 | 529726 | 6431936 | 24 | -21 | 32 | -49 | PL | (Corr'd Nav, Kongsberg 14208, img#30) (B) (T.A) |
| 14-Apr-2023 | 11:21:04 | 2325 | ECR_ENV_05 | | | camera | 73 | 529752 | 6431913 | 529726 | 6431936 | 25 | -23 | 34 | -48 | PL | (Corr'd Nav, Kongsberg 14208, img#31) (B) (T.A) |
| 14-Apr-2023 | 11:21:11 | 2326 | ECR_ENV_05 | | | camera | 73 | 529753 | 6431912 | 529726 | 6431936 | 27 | -24 | 36 | -48 | PL | (Corr'd Nav, Kongsberg 14208, img#32) (B) (T.A) |
| 14-Apr-2023 | 11:21:25 | 2327 | ECR_ENV_05 | | | camera | 73 | 529756 | 6431911 | 529726 | 6431936 | 29 | -26 | 39 | -49 | PL | (Corr'd Nav, Kongsberg 14208, img#33) (B) (T.A) |
| 14-Apr-2023 | 11:21:39 | 2328 | ECR_ENV_05 | | | camera | 73 | 529756 | 6431909 | 529726 | 6431936 | 30 | -27 | 41 | -48 | PL | (Corr'd Nav, Kongsberg 14208, img#34) (B) (T.A) |
| 14-Apr-2023 | 11:21:51 | 2329 | ECR_ENV_05 | | | camera | 73 | 529758 | 6431907 | 529726 | 6431936 | 32 | -29 | 43 | -48 | PL | (Corr'd Nav, Kongsberg 14208, img#35) (B) (T.A) |
| 14-Apr-2023 | 11:21:58 | 2330 | ECR_ENV_05 | | | camera | 73 | 529760 | 6431906 | 529726 | 6431936 | 33 | -30 | 45 | -48 | PL | (Corr'd Nav, Kongsberg 14208, img#36) (B) (T.A) |
| 14-Apr-2023 | 11:22:12 | 2331 | ECR_ENV_05 | | | camera | 73 | 529761 | 6431903 | 529726 | 6431936 | 35 | -33 | 48 | -47 | PL | (Corr'd Nav, Kongsberg 14208, img#37) (B) (T.A) |
| 14-Apr-2023 | 11:22:19 | 2332 | ECR_ENV_05 | | | camera | 73 | 529763 | 6431903 | 529726 | 6431936 | 36 | -34 | 50 | -47 | PL | (Corr'd Nav, Kongsberg 14208, img#38) (B) (T.A) |
| 14-Apr-2023 | 14:15:07 | 2333 | ECR_ENV_36 | | | camera | 71 | 527555 | 6435817 | 527614 | 6435820 | -59 | -3 | 59 | 87 | SG | (Raw Nav, Kongsberg 14208, img#1) (B) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | | Vertical / Tidal Datum | VORF, LAT | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 14-Apr-2023 | 14:15:43 | 2334 | ECR_ENV_36 | | | camera | 71 | 527559 | 6435814 | 527614 | 6435820 | -55 | -6 | 55 | 84 | SG | (Raw Nav, Kongsberg 14208, img#2) (B) |
| 14-Apr-2023 | 14:15:50 | 2335 | ECR_ENV_36 | | | camera | 71 | 527560 | 6435812 | 527614 | 6435820 | -54 | -8 | 55 | 82 | SG | (Raw Nav, Kongsberg 14208, img#3) (B) |
| 14-Apr-2023 | 14:16:09 | 2336 | ECR_ENV_36 | | | camera | 71 | 527565 | 6435813 | 527614 | 6435820 | -49 | -7 | 50 | 82 | SG | (Raw Nav, Kongsberg 14208, img#4) (B) |
| 14-Apr-2023 | 14:16:26 | 2337 | ECR_ENV_36 | | | camera | 71 | 527569 | 6435816 | 527614 | 6435820 | -45 | -4 | 45 | 85 | SG | (Raw Nav, Kongsberg 14208, img#5) (B) |
| 14-Apr-2023 | 14:16:38 | 2338 | ECR_ENV_36 | | | camera | 71 | 527572 | 6435816 | 527614 | 6435820 | -42 | -4 | 42 | 85 | SG | (Raw Nav, Kongsberg 14208, img#6) (B) |
| 14-Apr-2023 | 14:16:55 | 2339 | ECR_ENV_36 | | | camera | 72 | 527574 | 6435817 | 527614 | 6435820 | -40 | -3 | 40 | 86 | SG | (Raw Nav, Kongsberg 14208, img#7) (B) |
| 14-Apr-2023 | 14:17:05 | 2340 | ECR_ENV_36 | | | camera | 72 | 527576 | 6435817 | 527614 | 6435820 | -38 | -3 | 38 | 85 | SG | (Raw Nav, Kongsberg 14208, img#8) (B) |
| 14-Apr-2023 | 14:17:13 | 2341 | ECR_ENV_36 | | | camera | 71 | 527578 | 6435815 | 527614 | 6435820 | -36 | -5 | 36 | 82 | SG | (Raw Nav, Kongsberg 14208, img#9) (B) |
| 14-Apr-2023 | 14:17:43 | 2342 | ECR_ENV_36 | | | camera | 72 | 527580 | 6435819 | 527614 | 6435820 | -34 | -1 | 34 | 88 | SG | (Raw Nav, Kongsberg 14208, img#10) (B) |
| 14-Apr-2023 | 14:17:50 | 2343 | ECR_ENV_36 | | | camera | 71 | 527581 | 6435815 | 527614 | 6435820 | -33 | -5 | 33 | 81 | SG | (Raw Nav, Kongsberg 14208, img#11) (B) |
| 14-Apr-2023 | 14:18:08 | 2344 | ECR_ENV_36 | | | camera | 71 | 527583 | 6435819 | 527614 | 6435820 | -31 | -1 | 31 | 88 | SG | (Raw Nav, Kongsberg 14208, img#12) (B) |
| 14-Apr-2023 | 14:18:24 | 2345 | ECR_ENV_36 | | | camera | 71 | 527587 | 6435818 | 527614 | 6435820 | -27 | -2 | 27 | 86 | SG | (Raw Nav, Kongsberg 14208, img#13) (B) |
| 14-Apr-2023 | 14:18:39 | 2346 | ECR_ENV_36 | | | camera | 71 | 527589 | 6435818 | 527614 | 6435820 | -25 | -2 | 25 | 85 | SG | (Raw Nav, Kongsberg 14208, img#14) (B) |
| 14-Apr-2023 | 14:19:01 | 2347 | ECR_ENV_36 | | | camera | 71 | 527594 | 6435821 | 527614 | 6435820 | -20 | 1 | 20 | 93 | SG | (Raw Nav, Kongsberg 14208, img#15) (B) |
| 14-Apr-2023 | 14:19:09 | 2348 | ECR_ENV_36 | | | camera | 71 | 527595 | 6435821 | 527614 | 6435820 | -19 | 1 | 19 | 93 | SG | (Raw Nav, Kongsberg 14208, img#16) (B) |
| 14-Apr-2023 | 14:19:26 | 2349 | ECR_ENV_36 | | | camera | 72 | 527600 | 6435822 | 527614 | 6435820 | -14 | 2 | 14 | 98 | SG | (Raw Nav, Kongsberg 14208, img#17) (B) |
| 14-Apr-2023 | 14:19:43 | 2350 | ECR_ENV_36 | | | camera | 71 | 527603 | 6435823 | 527614 | 6435820 | -11 | 3 | 11 | 105 | SG | (Raw Nav, Kongsberg 14208, img#18) (B) |
| 14-Apr-2023 | 14:19:54 | 2351 | ECR_ENV_36 | | | camera | 71 | 527605 | 6435823 | 527614 | 6435820 | -9 | 3 | 10 | 108 | SG | (Raw Nav, Kongsberg 14208, img#19) (B) |
| 14-Apr-2023 | 14:20:24 | 2352 | ECR_ENV_36 | | | camera | 72 | 527613 | 6435823 | 527614 | 6435820 | -1 | 3 | 3 | 160 | SG | (Raw Nav, Kongsberg 14208, img#20) (B) |
| 14-Apr-2023 | 14:20:35 | 2353 | ECR_ENV_36 | | | camera | 72 | 527614 | 6435823 | 527614 | 6435820 | 0 | 3 | 3 | 178 | SG | (Raw Nav, Kongsberg 14208, img#21) (B) |
| 14-Apr-2023 | 14:20:59 | 2354 | ECR_ENV_36 | | | camera | 72 | 527618 | 6435823 | 527614 | 6435820 | 4 | 3 | 5 | -127 | SG | (Raw Nav, Kongsberg 14208, img#22) (B) |
| 14-Apr-2023 | 14:21:12 | 2355 | ECR_ENV_36 | | | camera | 71 | 527620 | 6435823 | 527614 | 6435820 | 6 | 3 | 7 | -117 | SG | (Raw Nav, Kongsberg 14208, img#23) (B) |
| 14-Apr-2023 | 14:21:19 | 2356 | ECR_ENV_36 | | | camera | 72 | 527622 | 6435823 | 527614 | 6435820 | 8 | 3 | 8 | -111 | SG | (Raw Nav, Kongsberg 14208, img#24) (B) |
| 14-Apr-2023 | 14:21:48 | 2357 | ECR_ENV_36 | | | camera | 71 | 527628 | 6435819 | 527614 | 6435820 | 14 | -1 | 14 | -86 | SG | (Raw Nav, Kongsberg 14208, img#25) (B) |
| 14-Apr-2023 | 14:22:08 | 2358 | ECR_ENV_36 | | | camera | 72 | 527635 | 6435822 | 527614 | 6435820 | 21 | 2 | 21 | -95 | SG | (Raw Nav, Kongsberg 14208, img#26) (B) |
| 14-Apr-2023 | 14:22:23 | 2359 | ECR_ENV_36 | | | camera | 72 | 527639 | 6435823 | 527614 | 6435820 | 25 | 3 | 25 | -97 | SG | (Raw Nav, Kongsberg 14208, img#27) (B) |
| 14-Apr-2023 | 14:22:38 | 2360 | ECR_ENV_36 | | | camera | 72 | 527642 | 6435824 | 527614 | 6435820 | 28 | 4 | 28 | -98 | SG | (Raw Nav, Kongsberg 14208, img#28) (B) |
| 14-Apr-2023 | 14:22:54 | 2361 | ECR_ENV_36 | | | camera | 72 | 527645 | 6435825 | 527614 | 6435820 | 31 | 5 | 31 | -99 | SG | (Raw Nav, Kongsberg 14208, img#29) (B) |
| 14-Apr-2023 | 14:23:00 | 2362 | ECR_ENV_36 | | | camera | 72 | 527647 | 6435826 | 527614 | 6435820 | 33 | 6 | 33 | -100 | SG | (Raw Nav, Kongsberg 14208, img#30) (B) |
| 14-Apr-2023 | 14:23:17 | 2363 | ECR_ENV_36 | | | camera | 72 | 527649 | 6435826 | 527614 | 6435820 | 35 | 6 | 35 | -100 | SG | (Raw Nav, Kongsberg 14208, img#31) (B) |
| 14-Apr-2023 | 14:23:26 | 2364 | ECR_ENV_36 | | | camera | 72 | 527651 | 6435825 | 527614 | 6435820 | 37 | 5 | 37 | -98 | SG | (Raw Nav, Kongsberg 14208, img#32) (B) |
| 14-Apr-2023 | 14:23:53 | 2365 | ECR_ENV_36 | | | camera | 72 | 527654 | 6435824 | 527614 | 6435820 | 40 | 4 | 40 | -96 | SG | (Raw Nav, Kongsberg 14208, img#33) (B) |
| 14-Apr-2023 | 14:24:12 | 2366 | ECR_ENV_36 | | | camera | 72 | 527657 | 6435824 | 527614 | 6435820 | 43 | 4 | 43 | -95 | SG | (Raw Nav, Kongsberg 14208, img#34) (B) |
| 14-Apr-2023 | 14:24:35 | 2367 | ECR_ENV_36 | | | camera | 72 | 527658 | 6435821 | 527614 | 6435820 | 44 | 1 | 44 | -91 | SG | (Raw Nav, Kongsberg 14208, img#35) (B) |
| 14-Apr-2023 | 14:24:57 | 2368 | ECR_ENV_36 | | | camera | 72 | 527664 | 6435822 | 527614 | 6435820 | 50 | 2 | 50 | -92 | SG | (Raw Nav, Kongsberg 14208, img#36) (B) |
| 14-Apr-2023 | 16:04:25 | 2369 | ECR_ENV_18 | | | camera | 66 | 529402 | 6435230 | 529459 | 6435225 | -57 | 5 | 58 | 95 | SG | (Corr'd Nav, Kongsberg 14208, img#1) (B) (T.A) |
| 14-Apr-2023 | 16:04:42 | 2370 | ECR_ENV_18 | | | camera | 67 | 529403 | 6435229 | 529459 | 6435225 | -56 | 4 | 56 | 94 | SG | (Corr'd Nav, Kongsberg 14208, img#2) (B) (T.A) |
| 14-Apr-2023 | 16:05:40 | 2371 | ECR_ENV_18 | | | camera | 66 | 529409 | 6435226 | 529459 | 6435225 | -50 | 1 | 50 | 91 | SG | (Corr'd Nav, Kongsberg 14208, img#3) (B) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 | |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 14-Apr-2023 | 16:06:10 | 2372 | ECR_ENV_18 | | | camera | 66 | 529415 | 6435226 | 529459 | 6435225 | -45 | 1 | 45 | 91 | SG | (Corr'd Nav, Kongsberg 14208, img#4) (B) (T.A) |
| 14-Apr-2023 | 16:06:29 | 2373 | ECR_ENV_18 | | | camera | 66 | 529417 | 6435226 | 529459 | 6435225 | -42 | 1 | 42 | 91 | SG | (Corr'd Nav, Kongsberg 14208, img#5) (B) (T.A) |
| 14-Apr-2023 | 16:06:42 | 2374 | ECR_ENV_18 | | | camera | 66 | 529419 | 6435226 | 529459 | 6435225 | -40 | 1 | 40 | 91 | SG | (Corr'd Nav, Kongsberg 14208, img#6) (B) (T.A) # No photo taken |
| 14-Apr-2023 | 16:07:02 | 2375 | ECR_ENV_18 | | | camera | 66 | 529422 | 6435224 | 529459 | 6435225 | -38 | -1 | 38 | 89 | SG | (Corr'd Nav, Kongsberg 14208, img#7) (B) (T.A) |
| 14-Apr-2023 | 16:07:22 | 2376 | ECR_ENV_18 | | | camera | 66 | 529424 | 6435224 | 529459 | 6435225 | -35 | -1 | 35 | 89 | SG | (Corr'd Nav, Kongsberg 14208, img#8) (B) (T.A) |
| 14-Apr-2023 | 16:07:41 | 2377 | ECR_ENV_18 | | | camera | 66 | 529427 | 6435224 | 529459 | 6435225 | -32 | -1 | 32 | 88 | SG | (Corr'd Nav, Kongsberg 14208, img#9) (B) (T.A) |
| 14-Apr-2023 | 16:07:47 | 2378 | ECR_ENV_18 | | | camera | 66 | 529428 | 6435221 | 529459 | 6435225 | -32 | -4 | 32 | 83 | SG | (Corr'd Nav, Kongsberg 14208, img#10) (B) (T.A) |
| 14-Apr-2023 | 16:08:00 | 2379 | ECR_ENV_18 | | | camera | 66 | 529430 | 6435225 | 529459 | 6435225 | -29 | 0 | 29 | 89 | SG | (Corr'd Nav, Kongsberg 14208, img#11) (B) (T.A) |
| 14-Apr-2023 | 16:08:13 | 2380 | ECR_ENV_18 | | | camera | 66 | 529432 | 6435225 | 529459 | 6435225 | -28 | 0 | 28 | 91 | SG | (Corr'd Nav, Kongsberg 14208, img#12) (B) (T.A) |
| 14-Apr-2023 | 16:08:32 | 2381 | ECR_ENV_18 | | | camera | 66 | 529434 | 6435225 | 529459 | 6435225 | -25 | 1 | 25 | 91 | SG | (Corr'd Nav, Kongsberg 14208, img#13) (B) (T.A) |
| 14-Apr-2023 | 16:08:44 | 2382 | ECR_ENV_18 | | | camera | 66 | 529436 | 6435227 | 529459 | 6435225 | -24 | 2 | 24 | 94 | SG | (Corr'd Nav, Kongsberg 14208, img#14) (B) (T.A) |
| 14-Apr-2023 | 16:09:01 | 2383 | ECR_ENV_18 | | | camera | 66 | 529437 | 6435224 | 529459 | 6435225 | -23 | -1 | 23 | 86 | SG | (Corr'd Nav, Kongsberg 14208, img#15) (B) (T.A) |
| 14-Apr-2023 | 16:09:23 | 2384 | ECR_ENV_18 | | | camera | 66 | 529439 | 6435224 | 529459 | 6435225 | -20 | -1 | 20 | 87 | SG | (Corr'd Nav, Kongsberg 14208, img#16) (B) (T.A) |
| 14-Apr-2023 | 16:09:33 | 2385 | ECR_ENV_18 | | | camera | 66 | 529441 | 6435227 | 529459 | 6435225 | -18 | 2 | 18 | 98 | SG | (Corr'd Nav, Kongsberg 14208, img#17) (B) (T.A) |
| 14-Apr-2023 | 16:09:57 | 2386 | ECR_ENV_18 | | | camera | 66 | 529445 | 6435228 | 529459 | 6435225 | -15 | 3 | 15 | 102 | SG | (Corr'd Nav, Kongsberg 14208, img#18) (B) (T.A) |
| 14-Apr-2023 | 16:10:20 | 2387 | ECR_ENV_18 | | | camera | 66 | 529448 | 6435229 | 529459 | 6435225 | -11 | 4 | 12 | 111 | SG | (Corr'd Nav, Kongsberg 14208, img#19) (B) (T.A) |
| 14-Apr-2023 | 16:10:38 | 2388 | ECR_ENV_18 | | | camera | 66 | 529449 | 6435230 | 529459 | 6435225 | -10 | 5 | 12 | 117 | SG | (Corr'd Nav, Kongsberg 14208, img#20) (B) (T.A) |
| 14-Apr-2023 | 16:11:01 | 2389 | ECR_ENV_18 | | | camera | 66 | 529451 | 6435231 | 529459 | 6435225 | -8 | 6 | 10 | 128 | SG | (Corr'd Nav, Kongsberg 14208, img#21) (B) (T.A) |
| 14-Apr-2023 | 16:11:30 | 2390 | ECR_ENV_18 | | | camera | 66 | 529455 | 6435233 | 529459 | 6435225 | -4 | 8 | 9 | 153 | SG | (Corr'd Nav, Kongsberg 14208, img#22) (B) (T.A) |
| 14-Apr-2023 | 16:12:36 | 2391 | ECR_ENV_18 | | | camera | 67 | 529461 | 6435238 | 529459 | 6435225 | 2 | 14 | 14 | -173 | SG | (Corr'd Nav, Kongsberg 14208, img#23) (B) (T.A) |
| 14-Apr-2023 | 16:12:50 | 2392 | ECR_ENV_18 | | | camera | 67 | 529463 | 6435239 | 529459 | 6435225 | 4 | 14 | 15 | -165 | SG | (Corr'd Nav, Kongsberg 14208, img#24) (B) (T.A) |
| 14-Apr-2023 | 16:13:19 | 2393 | ECR_ENV_18 | | | camera | 67 | 529465 | 6435244 | 529459 | 6435225 | 6 | 19 | 20 | -162 | SG | (Corr'd Nav, Kongsberg 14208, img#25) (B) (T.A) |
| 14-Apr-2023 | 16:13:36 | 2394 | ECR_ENV_18 | | | camera | 67 | 529465 | 6435246 | 529459 | 6435225 | 5 | 21 | 22 | -166 | SG | (Corr'd Nav, Kongsberg 14208, img#26) (B) (T.A) |
| 14-Apr-2023 | 16:13:50 | 2395 | ECR_ENV_18 | | | camera | 67 | 529464 | 6435246 | 529459 | 6435225 | 5 | 21 | 22 | -167 | SG | (Corr'd Nav, Kongsberg 14208, img#27) (B) (T.A) |
| 14-Apr-2023 | 16:14:10 | 2396 | ECR_ENV_18 | | | camera | 67 | 529465 | 6435245 | 529459 | 6435225 | 6 | 20 | 21 | -164 | SG | (Corr'd Nav, Kongsberg 14208, img#28) (B) (T.A) |
| 14-Apr-2023 | 16:15:04 | 2397 | ECR_ENV_18 | | | camera | 67 | 529466 | 6435249 | 529459 | 6435225 | 6 | 24 | 25 | -165 | SG | (Corr'd Nav, Kongsberg 14208, img#29) (B) (T.A) |
| 14-Apr-2023 | 16:15:25 | 2398 | ECR_ENV_18 | | | camera | 67 | 529466 | 6435247 | 529459 | 6435225 | 6 | 22 | 23 | -164 | SG | (Corr'd Nav, Kongsberg 14208, img#30) (B) (T.A) |
| 14-Apr-2023 | 16:16:07 | 2399 | ECR_ENV_18 | | | camera | 67 | 529471 | 6435246 | 529459 | 6435225 | 12 | 21 | 24 | -151 | SG | (Corr'd Nav, Kongsberg 14208, img#31) (B) (T.A) |
| 14-Apr-2023 | 16:16:34 | 2400 | ECR_ENV_18 | | | camera | 67 | 529476 | 6435245 | 529459 | 6435225 | 16 | 20 | 25 | -140 | SG | (Corr'd Nav, Kongsberg 14208, img#32) (B) (T.A) |
| 14-Apr-2023 | 16:17:11 | 2401 | ECR_ENV_18 | | | camera | 67 | 529477 | 6435242 | 529459 | 6435225 | 18 | 17 | 25 | -133 | SG | (Corr'd Nav, Kongsberg 14208, img#33) (B) (T.A) |
| 14-Apr-2023 | 16:17:32 | 2402 | ECR_ENV_18 | | | camera | 67 | 529479 | 6435241 | 529459 | 6435225 | 20 | 16 | 25 | -128 | SG | (Corr'd Nav, Kongsberg 14208, img#34) (B) (T.A) |
| 14-Apr-2023 | 16:18:10 | 2403 | ECR_ENV_18 | | | camera | 67 | 529485 | 6435236 | 529459 | 6435225 | 26 | 11 | 28 | -113 | SG | (Corr'd Nav, Kongsberg 14208, img#35) (B) (T.A) |
| 14-Apr-2023 | 16:18:34 | 2404 | ECR_ENV_18 | | | camera | 67 | 529482 | 6435235 | 529459 | 6435225 | 22 | 10 | 25 | -114 | SG | (Corr'd Nav, Kongsberg 14208, img#36) (B) (T.A) |
| 14-Apr-2023 | 16:18:50 | 2405 | ECR_ENV_18 | | | camera | 67 | 529489 | 6435233 | 529459 | 6435225 | 30 | 8 | 31 | -106 | SG | (Corr'd Nav, Kongsberg 14208, img#37) (B) (T.A) |
| 14-Apr-2023 | 16:19:03 | 2406 | ECR_ENV_18 | | | camera | 67 | 529489 | 6435231 | 529459 | 6435225 | 30 | 6 | 31 | -102 | SG | (Corr'd Nav, Kongsberg 14208, img#38) (B) (T.A) |
| 14-Apr-2023 | 16:19:34 | 2407 | ECR_ENV_18 | | | camera | 66 | 529488 | 6435229 | 529459 | 6435225 | 29 | 4 | 29 | -98 | SG | (Corr'd Nav, Kongsberg 14208, img#39) (B) (T.A) |
| 14-Apr-2023 | 16:19:51 | 2408 | ECR_ENV_18 | | | camera | 66 | 529490 | 6435230 | 529459 | 6435225 | 31 | 5 | 31 | -99 | SG | (Corr'd Nav, Kongsberg 14208, img#40) (B) (T.A) |
| 14-Apr-2023 | 16:20:13 | 2409 | ECR_ENV_18 | | | camera | 66 | 529492 | 6435228 | 529459 | 6435225 | 33 | 3 | 33 | -96 | SG | (Corr'd Nav, Kongsberg 14208, img#41) (B) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 14-Apr-2023 | 16:20 | 2410 | ECR_ENV_18 | | | camera | 66 | 529496 | 6435225 | 529459 | 6435225 | 37 | 1 | 37 | -91 | SG | (Corr'd Nav, Kongsberg 14208, img#42) (B) (T.A) |
| 14-Apr-2023 | 16:21 | 2411 | ECR_ENV_18 | | | camera | 66 | 529501 | 6435223 | 529459 | 6435225 | 42 | -2 | 42 | -87 | SG | (Corr'd Nav, Kongsberg 14208, img#43) (B) (T.A) |
| 14-Apr-2023 | 16:21 | 2412 | ECR_ENV_18 | | | camera | 66 | 529505 | 6435221 | 529459 | 6435225 | 46 | -4 | 46 | -85 | SG | (Corr'd Nav, Kongsberg 14208, img#44) (B) (T.A) |
| 19-May-2023 | 19:41 | 4195 | ECR_ENV_61 | | | camera | 50 | 523340 | 6398255 | 523346 | 6398196 | -7 | 59 | 60 | 174 | | (Corr'd Nav, Kongsberg 14208, img#1) (V) (T.A) |
| 19-May-2023 | 19:41 | 4196 | ECR_ENV_61 | | | camera | 50 | 523339 | 6398254 | 523346 | 6398196 | -7 | 58 | 59 | 173 | | (Corr'd Nav, Kongsberg 14208, img#2) (V) (T.A) |
| 19-May-2023 | 19:42 | 4197 | ECR_ENV_61 | | | camera | 50 | 523338 | 6398247 | 523346 | 6398196 | -8 | 51 | 51 | 171 | | (Corr'd Nav, Kongsberg 14208, img#3) (V) (T.A) |
| 19-May-2023 | 19:44 | 4198 | ECR_ENV_61 | | | camera | 50 | 523334 | 6398229 | 523346 | 6398196 | -12 | 33 | 35 | 160 | | (Corr'd Nav, Kongsberg 14208, img#4) (V) (T.A) |
| 19-May-2023 | 19:45 | 4199 | ECR_ENV_61 | | | camera | 50 | 523338 | 6398225 | 523346 | 6398196 | -9 | 29 | 30 | 163 | | (Corr'd Nav, Kongsberg 14208, img#5) (V) (T.A) |
| 19-May-2023 | 19:46 | 4200 | ECR_ENV_61 | | | camera | 49 | 523344 | 6398219 | 523346 | 6398196 | -2 | 23 | 23 | 175 | | (Corr'd Nav, Kongsberg 14208, img#6) (V) (T.A) |
| 19-May-2023 | 19:46 | 4201 | ECR_ENV_61 | | | camera | 49 | 523345 | 6398217 | 523346 | 6398196 | -1 | 21 | 21 | 177 | | (Corr'd Nav, Kongsberg 14208, img#7) (V) (T.A) |
| 19-May-2023 | 19:47 | 4202 | ECR_ENV_61 | | | camera | 49 | 523348 | 6398207 | 523346 | 6398196 | 1 | 12 | 12 | -173 | | (Corr'd Nav, Kongsberg 14208, img#8) (V) (T.A) |
| 19-May-2023 | 19:49 | 4203 | ECR_ENV_61 | | | camera | 50 | 523347 | 6398201 | 523346 | 6398196 | 0 | 5 | 5 | -179 | | (Corr'd Nav, Kongsberg 14208, img#9) (V) (T.A) |
| 19-May-2023 | 19:50 | 4204 | ECR_ENV_61 | | | camera | 49 | 523345 | 6398193 | 523346 | 6398196 | -2 | -3 | 3 | 31 | | (Corr'd Nav, Kongsberg 14208, img#10) (V) (T.A) |
| 19-May-2023 | 19:50 | 4205 | ECR_ENV_61 | | | camera | 49 | 523345 | 6398190 | 523346 | 6398196 | -2 | -6 | 6 | 19 | | (Corr'd Nav, Kongsberg 14208, img#11) (V) (T.A) |
| 19-May-2023 | 19:51 | 4206 | ECR_ENV_61 | | | camera | 49 | 523344 | 6398185 | 523346 | 6398196 | -3 | -11 | 11 | 14 | | (Corr'd Nav, Kongsberg 14208, img#12) (V) (T.A) |
| 19-May-2023 | 19:51 | 4207 | ECR_ENV_61 | | | camera | 50 | 523343 | 6398181 | 523346 | 6398196 | -3 | -15 | 15 | 12 | | (Corr'd Nav, Kongsberg 14208, img#13) (V) (T.A) |
| 19-May-2023 | 19:52 | 4208 | ECR_ENV_61 | | | camera | 49 | 523342 | 6398176 | 523346 | 6398196 | -4 | -20 | 20 | 11 | | (Corr'd Nav, Kongsberg 14208, img#14) (V) (T.A) |
| 19-May-2023 | 19:53 | 4209 | ECR_ENV_61 | | | camera | 49 | 523344 | 6398166 | 523346 | 6398196 | -2 | -30 | 30 | 4 | | (Corr'd Nav, Kongsberg 14208, img#15) (V) (T.A) |
| 19-May-2023 | 19:53 | 4210 | ECR_ENV_61 | | | camera | 49 | 523346 | 6398163 | 523346 | 6398196 | -1 | -33 | 33 | 1 | | (Corr'd Nav, Kongsberg 14208, img#16) (V) (T.A) |
| 19-May-2023 | 19:54 | 4211 | ECR_ENV_61 | | | camera | 49 | 523347 | 6398162 | 523346 | 6398196 | 0 | -34 | 34 | 0 | | (Corr'd Nav, Kongsberg 14208, img#17) (V) (T.A) |
| 19-May-2023 | 19:54 | 4212 | ECR_ENV_61 | | | camera | 49 | 523348 | 6398159 | 523346 | 6398196 | 1 | -37 | 37 | -2 | | (Corr'd Nav, Kongsberg 14208, img#18) (V) (T.A) |
| 19-May-2023 | 19:55 | 4213 | ECR_ENV_61 | | | camera | 49 | 523352 | 6398153 | 523346 | 6398196 | 6 | -43 | 43 | -7 | | (Corr'd Nav, Kongsberg 14208, img#19) (V) (T.A) |
| 19-May-2023 | 19:55 | 4214 | ECR_ENV_61 | | | camera | 49 | 523354 | 6398152 | 523346 | 6398196 | 7 | -44 | 44 | -9 | | (Corr'd Nav, Kongsberg 14208, img#20) (V) (T.A) |
| 19-May-2023 | 19:55 | 4215 | ECR_ENV_61 | | | camera | 49 | 523356 | 6398150 | 523346 | 6398196 | 10 | -46 | 47 | -12 | | (Corr'd Nav, Kongsberg 14208, img#21) (V) (T.A) |
| 19-May-2023 | 19:55 | 4216 | ECR_ENV_61 | | | camera | 49 | 523359 | 6398149 | 523346 | 6398196 | 12 | -47 | 49 | -14 | | (Corr'd Nav, Kongsberg 14208, img#22) (V) (T.A) |
| 19-May-2023 | 19:55 | 4217 | ECR_ENV_61 | | | camera | 49 | 523362 | 6398148 | 523346 | 6398196 | 15 | -48 | 51 | -18 | | (Corr'd Nav, Kongsberg 14208, img#23) (V) (T.A) |
| 19-May-2023 | 19:56 | 4218 | ECR_ENV_61 | | | camera | 49 | 523364 | 6398146 | 523346 | 6398196 | 17 | -50 | 53 | -19 | | (Corr'd Nav, Kongsberg 14208, img#24) (V) (T.A) |
| 19-May-2023 | 19:56 | 4219 | ECR_ENV_61 | | | camera | 49 | 523366 | 6398144 | 523346 | 6398196 | 19 | -52 | 55 | -20 | | (Corr'd Nav, Kongsberg 14208, img#25) (V) (T.A) |
| 19-May-2023 | 19:56 | 4220 | ECR_ENV_61 | | | camera | 49 | 523368 | 6398143 | 523346 | 6398196 | 22 | -53 | 57 | -22 | | (Corr'd Nav, Kongsberg 14208, img#26) (V) (T.A) |
| 19-May-2023 | 19:57 | 4221 | ECR_ENV_61 | | | camera | 50 | 523370 | 6398140 | 523346 | 6398196 | 24 | -56 | 60 | -23 | | (Corr'd Nav, Kongsberg 14208, img#27) (V) (T.A) |
| 19-May-2023 | 19:57 | 4222 | ECR_ENV_61 | | | camera | 50 | 523371 | 6398139 | 523346 | 6398196 | 25 | -57 | 62 | -23 | | (Corr'd Nav, Kongsberg 14208, img#28) (V) (T.A) |
| 19-May-2023 | 19:57 | 4223 | ECR_ENV_61 | | | camera | 50 | 523372 | 6398138 | 523346 | 6398196 | 26 | -58 | 64 | -24 | | (Corr'd Nav, Kongsberg 14208, img#29) (V) (T.A) |
| 19-May-2023 | 19:58 | 4224 | ECR_ENV_61 | | | camera | 50 | 523374 | 6398135 | 523346 | 6398196 | 27 | -61 | 66 | -24 | | (Corr'd Nav, Kongsberg 14208, img#30) (V) (T.A) |
| 19-May-2023 | 19:58 | 4225 | ECR_ENV_61 | | | camera | 50 | 523375 | 6398134 | 523346 | 6398196 | 29 | -62 | 69 | -25 | | (Corr'd Nav, Kongsberg 14208, img#31) (V) (T.A) |
| 19-May-2023 | 21:16 | 4226 | ECR_ENV_62 | | | camera | 44 | 524128 | 6397218 | 524122 | 6397153 | 6 | 65 | 66 | -174 | | (Corr'd Nav, Kongsberg 14208, img#32) (V) (T.A) |
| 19-May-2023 | 21:16:55 | 4227 | ECR_ENV_62 | | | camera | 46 | 524126 | 6397214 | 524122 | 6397153 | 4 | 62 | 62 | 4 | | (Raw Nav, Kongsberg 14208, img#33) (V) |
| 19-May-2023 | 21:17:27 | 4228 | ECR_ENV_62 | | | camera | 46 | 524124 | 6397211 | 524122 | 6397153 | 2 | 59 | 59 | 2 | | (Raw Nav, Kongsberg 14208, img#34) (V) |

# APPENDIX B FIELD SAMPLING LOGS

Seafloor Sampling Positioning Summary

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | | Vessel | MV *Ocean Endeavour* | | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | | Vessel Reference Point (VRP) | COG | | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 | |
| Primary Positioning System | Starpack 1 | | | | Actual Coordinates derived from | Vessel | | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | | Projection | UTM zone 30N | | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 19-May-2023 | 21:17:37 | 4229 | ECR_ENV_62 | | | camera | 46 | 524124 | 6397211 | 524122 | 6397153 | 2 | 58 | 58 | 2 | | (Raw Nav, Kongsberg 14208, img#35) (V) |
| 19-May-2023 | 21:18:11 | 4230 | ECR_ENV_62 | | | camera | 46 | 524124 | 6397207 | 524122 | 6397153 | 2 | 54 | 54 | 2 | | (Raw Nav, Kongsberg 14208, img#36) (V) |
| 19-May-2023 | 21:18:42 | 4231 | ECR_ENV_62 | | | camera | 46 | 524123 | 6397204 | 524122 | 6397153 | 1 | 51 | 51 | 1 | | (Raw Nav, Kongsberg 14208, img#37) (V) |
| 19-May-2023 | 21:19:21 | 4232 | ECR_ENV_62 | | | camera | 46 | 524124 | 6397198 | 524122 | 6397153 | 2 | 46 | 46 | 3 | | (Raw Nav, Kongsberg 14208, img#38) (V) |
| 19-May-2023 | 21:19:37 | 4233 | ECR_ENV_62 | | | camera | 46 | 524125 | 6397196 | 524122 | 6397153 | 3 | 44 | 44 | 4 | | (Raw Nav, Kongsberg 14208, img#39) (V) |
| 19-May-2023 | 21:20:00 | 4234 | ECR_ENV_62 | | | camera | 46 | 524127 | 6397193 | 524122 | 6397153 | 5 | 41 | 41 | 7 | | (Raw Nav, Kongsberg 14208, img#40) (V) |
| 19-May-2023 | 21:20:13 | 4235 | ECR_ENV_62 | | | camera | 46 | 524128 | 6397192 | 524122 | 6397153 | 6 | 39 | 40 | 9 | | (Raw Nav, Kongsberg 14208, img#41) (V) |
| 19-May-2023 | 21:21:03 | 4236 | ECR_ENV_62 | | | camera | 46 | 524126 | 6397187 | 524122 | 6397153 | 4 | 34 | 34 | 7 | | (Raw Nav, Kongsberg 14208, img#42) (V) |
| 19-May-2023 | 21:22:21 | 4237 | ECR_ENV_62 | | | camera | 46 | 524125 | 6397181 | 524122 | 6397153 | 3 | 29 | 29 | 7 | | (Raw Nav, Kongsberg 14208, img#43) (V) |
| 19-May-2023 | 21:23:22 | 4238 | ECR_ENV_62 | | | camera | 46 | 524124 | 6397174 | 524122 | 6397153 | 2 | 22 | 22 | 5 | | (Raw Nav, Kongsberg 14208, img#44) (V) |
| 19-May-2023 | 21:23:30 | 4239 | ECR_ENV_62 | | | camera | 46 | 524124 | 6397173 | 524122 | 6397153 | 2 | 20 | 20 | 5 | | (Raw Nav, Kongsberg 14208, img#45) (V) |
| 19-May-2023 | 21:23:57 | 4240 | ECR_ENV_62 | | | camera | 46 | 524124 | 6397170 | 524122 | 6397153 | 2 | 17 | 17 | 5 | | (Raw Nav, Kongsberg 14208, img#46) (V) |
| 19-May-2023 | 21:24:32 | 4241 | ECR_ENV_62 | | | camera | 46 | 524123 | 6397165 | 524122 | 6397153 | 1 | 12 | 12 | 6 | | (Raw Nav, Kongsberg 14208, img#47) (V) |
| 19-May-2023 | 21:24:38 | 4242 | ECR_ENV_62 | | | camera | 46 | 524123 | 6397164 | 524122 | 6397153 | 1 | 11 | 11 | 7 | | (Raw Nav, Kongsberg 14208, img#48) (V) |
| 19-May-2023 | 21:25:12 | 4243 | ECR_ENV_62 | | | camera | 46 | 524124 | 6397158 | 524122 | 6397153 | 2 | 5 | 6 | 17 | | (Raw Nav, Kongsberg 14208, img#49) (V) |
| 19-May-2023 | 21:25:33 | 4244 | ECR_ENV_62 | | | camera | 46 | 524124 | 6397155 | 524122 | 6397153 | 2 | 2 | 3 | 46 | | (Raw Nav, Kongsberg 14208, img#50) (V) |
| 19-May-2023 | 21:25:51 | 4245 | ECR_ENV_62 | | | camera | 46 | 524124 | 6397153 | 524122 | 6397153 | 2 | 0 | 2 | 92 | | (Raw Nav, Kongsberg 14208, img#51) (V) |
| 19-May-2023 | 21:27:02 | 4246 | ECR_ENV_62 | | | camera | 46 | 524125 | 6397147 | 524122 | 6397153 | 3 | -6 | 6 | 155 | | (Raw Nav, Kongsberg 14208, img#52) (V) |
| 19-May-2023 | 21:27:26 | 4247 | ECR_ENV_62 | | | camera | 46 | 524125 | 6397144 | 524122 | 6397153 | 3 | -9 | 9 | 158 | | (Raw Nav, Kongsberg 14208, img#53) (V) |
| 19-May-2023 | 21:27:39 | 4248 | ECR_ENV_62 | | | camera | 46 | 524126 | 6397142 | 524122 | 6397153 | 4 | -11 | 12 | 158 | | (Raw Nav, Kongsberg 14208, img#54) (V) |
| 19-May-2023 | 21:27:54 | 4249 | ECR_ENV_62 | | | camera | 46 | 524128 | 6397140 | 524122 | 6397153 | 6 | -13 | 14 | 156 | | (Raw Nav, Kongsberg 14208, img#55) (V) |
| 19-May-2023 | 21:28:21 | 4250 | ECR_ENV_62 | | | camera | 46 | 524127 | 6397137 | 524122 | 6397153 | 5 | -16 | 17 | 161 | | (Raw Nav, Kongsberg 14208, img#56) (V) |
| 19-May-2023 | 21:29:09 | 4251 | ECR_ENV_62 | | | camera | 46 | 524126 | 6397132 | 524122 | 6397153 | 4 | -21 | 21 | 168 | | (Raw Nav, Kongsberg 14208, img#57) (V) |
| 19-May-2023 | 21:29:36 | 4252 | ECR_ENV_62 | | | camera | 46 | 524126 | 6397129 | 524122 | 6397153 | 4 | -24 | 24 | 171 | | (Raw Nav, Kongsberg 14208, img#58) (V) |
| 19-May-2023 | 21:30:10 | 4253 | ECR_ENV_62 | | | camera | 46 | 524126 | 6397125 | 524122 | 6397153 | 4 | -28 | 28 | 173 | | (Raw Nav, Kongsberg 14208, img#59) (V) |
| 19-May-2023 | 21:30:22 | 4254 | ECR_ENV_62 | | | camera | 46 | 524126 | 6397124 | 524122 | 6397153 | 4 | -29 | 29 | 172 | | (Raw Nav, Kongsberg 14208, img#60) (V) |
| 19-May-2023 | 21:30:42 | 4255 | ECR_ENV_62 | | | camera | 46 | 524126 | 6397122 | 524122 | 6397153 | 4 | -31 | 31 | 172 | | (Raw Nav, Kongsberg 14208, img#61) (V) |
| 19-May-2023 | 21:31:01 | 4256 | ECR_ENV_62 | | | camera | 46 | 524126 | 6397120 | 524122 | 6397153 | 4 | -33 | 33 | 173 | | (Raw Nav, Kongsberg 14208, img#62) (V) |
| 19-May-2023 | 21:31:23 | 4257 | ECR_ENV_62 | | | camera | 46 | 524126 | 6397117 | 524122 | 6397153 | 4 | -35 | 36 | 174 | | (Raw Nav, Kongsberg 14208, img#63) (V) |
| 19-May-2023 | 21:31:34 | 4258 | ECR_ENV_62 | | | camera | 46 | 524126 | 6397116 | 524122 | 6397153 | 3 | -37 | 37 | 175 | | (Raw Nav, Kongsberg 14208, img#64) (V) |
| 19-May-2023 | 21:31:40 | 4259 | ECR_ENV_62 | | | camera | 46 | 524125 | 6397115 | 524122 | 6397153 | 3 | -38 | 38 | 175 | | (Raw Nav, Kongsberg 14208, img#65) (V) |
| 19-May-2023 | 21:32:01 | 4260 | ECR_ENV_62 | | | camera | 46 | 524126 | 6397112 | 524122 | 6397153 | 4 | -40 | 40 | 175 | | (Raw Nav, Kongsberg 14208, img#66) (V) |
| 19-May-2023 | 21:32:14 | 4261 | ECR_ENV_62 | | | camera | 46 | 524126 | 6397110 | 524122 | 6397153 | 4 | -42 | 42 | 175 | | (Raw Nav, Kongsberg 14208, img#67) (V) |
| 19-May-2023 | 21:32:26 | 4262 | ECR_ENV_62 | | | camera | 46 | 524126 | 6397109 | 524122 | 6397153 | 4 | -44 | 44 | 175 | | (Raw Nav, Kongsberg 14208, img#68) (V) |
| 19-May-2023 | 21:32:40 | 4263 | ECR_ENV_62 | | | camera | 46 | 524127 | 6397107 | 524122 | 6397153 | 5 | -46 | 46 | 174 | | (Raw Nav, Kongsberg 14208, img#69) (V) |
| 19-May-2023 | 21:33:03 | 4264 | ECR_ENV_62 | | | camera | 46 | 524128 | 6397103 | 524122 | 6397153 | 6 | -50 | 50 | 174 | | (Raw Nav, Kongsberg 14208, img#70) (V) |
| 19-May-2023 | 21:33:34 | 4265 | ECR_ENV_62 | | | camera | 46 | 524130 | 6397098 | 524122 | 6397153 | 8 | -54 | 55 | 171 | | (Raw Nav, Kongsberg 14208, img#71) (V) |
| 19-May-2023 | 21:34:02 | 4266 | ECR_ENV_62 | | | camera | 46 | 524130 | 6397094 | 524122 | 6397153 | 8 | -58 | 59 | 172 | | (Raw Nav, Kongsberg 14208, img#72) (V) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 | | |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Vessel | | | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | | Vertical / Tidal Datum | VORF, LAT | | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 19-May-2023 | 21:34:43 | 4267 | ECR_ENV_62 | | | camera | 46 | 524129 | 6397087 | 524122 | 6397153 | 7 | -65 | 66 | 174 | | (Raw Nav, Kongsberg 14208, img#73) (V) |
| 19-May-2023 | 21:35:05 | 4268 | ECR_ENV_62 | | | camera | 46 | 524130 | 6397084 | 524122 | 6397153 | 8 | -69 | 69 | 174 | | (Raw Nav, Kongsberg 14208, img#74) (V) |
| 19-May-2023 | 21:35:23 | 4269 | ECR_ENV_62 | | | camera | 46 | 524130 | 6397081 | 524122 | 6397153 | 8 | -71 | 72 | 174 | | (Raw Nav, Kongsberg 14208, img#75) (V) |
| 19-May-2023 | 21:35:52 | 4270 | ECR_ENV_62 | | | camera | 45 | 524128 | 6397078 | 524122 | 6397153 | 6 | -75 | 75 | 175 | | (Raw Nav, Kongsberg 14208, img#76) (V) |
| 19-May-2023 | 21:36:19 | 4271 | ECR_ENV_62 | | | camera | 45 | 524127 | 6397074 | 524122 | 6397153 | 5 | -79 | 79 | 176 | | (Raw Nav, Kongsberg 14208, img#77) (V) |
| 19-May-2023 | 21:36:46 | 4272 | ECR_ENV_62 | | | camera | 45 | 524124 | 6397069 | 524122 | 6397153 | 2 | -83 | 83 | 179 | | (Raw Nav, Kongsberg 14208, img#78) (V) |
| 19-May-2023 | 21:37:06 | 4273 | ECR_ENV_62 | | | camera | 45 | 524122 | 6397066 | 524122 | 6397153 | 0 | -86 | 86 | 180 | | (Raw Nav, Kongsberg 14208, img#79) (V) |
| 19-May-2023 | 21:39:05 | 4274 | ECR_ENV_62 | | | camera | 45 | 524129 | 6397049 | 524122 | 6397153 | 7 | -104 | 104 | 176 | | (Raw Nav, Kongsberg 14208, img#80) (V) |
| 19-May-2023 | 21:39:46 | 4275 | ECR_ENV_62 | | | camera | 45 | 524132 | 6397040 | 524122 | 6397153 | 10 | -112 | 113 | 175 | | (Raw Nav, Kongsberg 14208, img#81) (V) |
| 19-May-2023 | 21:40 | 4276 | ECR_ENV_62 | | | camera | 42 | 524139 | 6397035 | 524122 | 6397153 | 17 | -117 | 119 | -8 | | (Corr'd Nav, Kongsberg 14208, img#82) (V) (T.A) |
| 19-May-2023 | 22:26 | 4277 | ECR_ENV_60 | | | camera | 38 | 522606 | 6397251 | 522593 | 6397194 | 13 | 57 | 58 | -167 | | (Corr'd Nav, Kongsberg 14208, img#83) (V) (T.A) |
| 19-May-2023 | 22:29 | 4289 | ECR_ENV_60 | | | camera | 38 | 522609 | 6397242 | 522593 | 6397194 | 16 | 48 | 51 | -161 | | (Corr'd Nav, Kongsberg 14208, img#95) (V) (T.A) |
| 19-May-2023 | 22:29 | 4290 | ECR_ENV_60 | | | camera | 38 | 522610 | 6397239 | 522593 | 6397194 | 17 | 45 | 48 | -160 | | (Corr'd Nav, Kongsberg 14208, img#96) (V) (T.A) |
| 19-May-2023 | 22:29 | 4291 | ECR_ENV_60 | | | camera | 38 | 522608 | 6397238 | 522593 | 6397194 | 15 | 44 | 46 | -161 | | (Corr'd Nav, Kongsberg 14208, img#97) (V) (T.A) |
| 19-May-2023 | 22:30 | 4292 | ECR_ENV_60 | | | camera | 38 | 522608 | 6397236 | 522593 | 6397194 | 15 | 41 | 44 | -161 | | (Corr'd Nav, Kongsberg 14208, img#98) (V) (T.A) |
| 19-May-2023 | 22:30 | 4293 | ECR_ENV_60 | | | camera | 39 | 522606 | 6397232 | 522593 | 6397194 | 13 | 38 | 40 | -161 | | (Corr'd Nav, Kongsberg 14208, img#99) (V) (T.A) |
| 19-May-2023 | 22:30 | 4294 | ECR_ENV_60 | | | camera | 39 | 522605 | 6397231 | 522593 | 6397194 | 12 | 37 | 39 | -162 | | (Corr'd Nav, Kongsberg 14208, img#100) (V) (T.A) |
| 19-May-2023 | 22:30 | 4295 | ECR_ENV_60 | | | camera | 38 | 522605 | 6397230 | 522593 | 6397194 | 12 | 36 | 38 | -162 | | (Corr'd Nav, Kongsberg 14208, img#101) (V) (T.A) |
| 19-May-2023 | 22:30 | 4296 | ECR_ENV_60 | | | camera | 38 | 522605 | 6397228 | 522593 | 6397194 | 12 | 34 | 36 | -161 | | (Corr'd Nav, Kongsberg 14208, img#102) (V) (T.A) |
| 19-May-2023 | 22:31 | 4297 | ECR_ENV_60 | | | camera | 39 | 522604 | 6397227 | 522593 | 6397194 | 11 | 33 | 34 | -161 | | (Corr'd Nav, Kongsberg 14208, img#103) (V) (T.A) |
| 19-May-2023 | 22:31 | 4298 | ECR_ENV_60 | | | camera | 39 | 522603 | 6397225 | 522593 | 6397194 | 10 | 31 | 33 | -162 | | (Corr'd Nav, Kongsberg 14208, img#104) (V) (T.A) |
| 19-May-2023 | 22:31 | 4299 | ECR_ENV_60 | | | camera | 39 | 522603 | 6397224 | 522593 | 6397194 | 10 | 30 | 32 | -162 | | (Corr'd Nav, Kongsberg 14208, img#105) (V) (T.A) |
| 19-May-2023 | 22:32 | 4300 | ECR_ENV_60 | | | camera | 39 | 522600 | 6397219 | 522593 | 6397194 | 7 | 25 | 26 | -164 | | (Corr'd Nav, Kongsberg 14208, img#106) (V) (T.A) |
| 19-May-2023 | 22:32 | 4301 | ECR_ENV_60 | | | camera | 39 | 522600 | 6397218 | 522593 | 6397194 | 7 | 23 | 24 | -164 | | (Corr'd Nav, Kongsberg 14208, img#107) (V) (T.A) |
| 19-May-2023 | 22:32 | 4302 | ECR_ENV_60 | | | camera | 39 | 522599 | 6397216 | 522593 | 6397194 | 6 | 22 | 23 | -165 | | (Corr'd Nav, Kongsberg 14208, img#108) (V) (T.A) |
| 19-May-2023 | 22:32 | 4303 | ECR_ENV_60 | | | camera | 39 | 522599 | 6397214 | 522593 | 6397194 | 6 | 20 | 21 | -162 | | (Corr'd Nav, Kongsberg 14208, img#109) (V) (T.A) |
| 19-May-2023 | 22:32 | 4304 | ECR_ENV_60 | | | camera | 39 | 522600 | 6397213 | 522593 | 6397194 | 7 | 19 | 20 | -160 | | (Corr'd Nav, Kongsberg 14208, img#110) (V) (T.A) |
| 19-May-2023 | 22:33 | 4305 | ECR_ENV_60 | | | camera | 39 | 522598 | 6397209 | 522593 | 6397194 | 5 | 15 | 15 | -163 | | (Corr'd Nav, Kongsberg 14208, img#111) (V) (T.A) |
| 19-May-2023 | 22:33 | 4306 | ECR_ENV_60 | | | camera | 39 | 522598 | 6397206 | 522593 | 6397194 | 5 | 12 | 13 | -159 | | (Corr'd Nav, Kongsberg 14208, img#112) (V) (T.A) |
| 19-May-2023 | 22:33 | 4307 | ECR_ENV_60 | | | camera | 39 | 522597 | 6397203 | 522593 | 6397194 | 4 | 9 | 10 | -158 | | (Corr'd Nav, Kongsberg 14208, img#113) (V) (T.A) |
| 19-May-2023 | 22:34 | 4308 | ECR_ENV_60 | | | camera | 39 | 522597 | 6397198 | 522593 | 6397194 | 4 | 3 | 5 | -131 | | (Corr'd Nav, Kongsberg 14208, img#114) (V) (T.A) |
| 19-May-2023 | 22:35 | 4309 | ECR_ENV_60 | | | camera | 39 | 522594 | 6397194 | 522593 | 6397194 | 1 | 0 | 1 | -89 | | (Corr'd Nav, Kongsberg 14208, img#115) (V) (T.A) |
| 19-May-2023 | 22:35 | 4310 | ECR_ENV_60 | | | camera | 39 | 522593 | 6397193 | 522593 | 6397194 | 0 | -1 | 1 | -3 | | (Corr'd Nav, Kongsberg 14208, img#116) (V) (T.A) |
| 19-May-2023 | 22:35 | 4311 | ECR_ENV_60 | | | camera | 39 | 522593 | 6397193 | 522593 | 6397194 | 0 | -2 | 2 | 14 | | (Corr'd Nav, Kongsberg 14208, img#117) (V) (T.A) |
| 19-May-2023 | 22:35 | 4312 | ECR_ENV_60 | | | camera | 39 | 522591 | 6397190 | 522593 | 6397194 | -2 | -4 | 5 | 24 | | (Corr'd Nav, Kongsberg 14208, img#118) (V) (T.A) |
| 19-May-2023 | 22:36 | 4313 | ECR_ENV_60 | | | camera | 39 | 522589 | 6397188 | 522593 | 6397194 | -4 | -7 | 8 | 28 | | (Corr'd Nav, Kongsberg 14208, img#119) (V) (T.A) |
| 19-May-2023 | 22:36 | 4314 | ECR_ENV_60 | | | camera | 39 | 522589 | 6397186 | 522593 | 6397194 | -4 | -9 | 9 | 23 | | (Corr'd Nav, Kongsberg 14208, img#120) (V) (T.A) |
| 19-May-2023 | 22:36 | 4315 | ECR_ENV_60 | | | camera | 39 | 522589 | 6397182 | 522593 | 6397194 | -4 | -13 | 13 | 19 | | (Corr'd Nav, Kongsberg 14208, img#121) (V) (T.A) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | | | Vessel | MV *Ocean Endeavour* | | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | | | Vessel Reference Point (VRP) | COG | | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 | |
| Primary Positioning System | Starpack 1 | | | | | Actual Coordinates derived from | Vessel | | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | | | Projection | UTM zone 30N | | | | Vertical / Tidal Datum | VORF, LAT | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 19-May-2023 | 22:36 | 4316 | ECR_ENV_60 | | | camera | 39 | 522589 | 6397180 | 522593 | 6397194 | -4 | -15 | 15 | 16 | | (Corr'd Nav, Kongsberg 14208, img#122) (V) (T.A) |
| 19-May-2023 | 22:37 | 4317 | ECR_ENV_60 | | | camera | 39 | 522591 | 6397176 | 522593 | 6397194 | -2 | -19 | 19 | 7 | | (Corr'd Nav, Kongsberg 14208, img#123) (V) (T.A) |
| 19-May-2023 | 22:37 | 4318 | ECR_ENV_60 | | | camera | 39 | 522592 | 6397173 | 522593 | 6397194 | -1 | -22 | 22 | 2 | | (Corr'd Nav, Kongsberg 14208, img#124) (V) (T.A) |
| 19-May-2023 | 22:37 | 4319 | ECR_ENV_60 | | | camera | 39 | 522592 | 6397171 | 522593 | 6397194 | -1 | -23 | 23 | 2 | | (Corr'd Nav, Kongsberg 14208, img#125) (V) (T.A) |
| 19-May-2023 | 22:38 | 4320 | ECR_ENV_60 | | | camera | 38 | 522591 | 6397165 | 522593 | 6397194 | -2 | -29 | 29 | 4 | | (Corr'd Nav, Kongsberg 14208, img#126) (V) (T.A) |
| 19-May-2023 | 22:38 | 4321 | ECR_ENV_60 | | | camera | 38 | 522590 | 6397163 | 522593 | 6397194 | -3 | -32 | 32 | 5 | | (Corr'd Nav, Kongsberg 14208, img#127) (V) (T.A) |
| 19-May-2023 | 22:39 | 4322 | ECR_ENV_60 | | | camera | 38 | 522592 | 6397159 | 522593 | 6397194 | -1 | -35 | 35 | 1 | | (Corr'd Nav, Kongsberg 14208, img#128) (V) (T.A) |
| 19-May-2023 | 22:39 | 4323 | ECR_ENV_60 | | | camera | 38 | 522591 | 6397158 | 522593 | 6397194 | -2 | -36 | 36 | 3 | | (Corr'd Nav, Kongsberg 14208, img#129) (V) (T.A) |
| 19-May-2023 | 22:40 | 4324 | ECR_ENV_60 | | | camera | 38 | 522588 | 6397152 | 522593 | 6397194 | -5 | -43 | 43 | 7 | | (Corr'd Nav, Kongsberg 14208, img#130) (V) (T.A) |
| 19-May-2023 | 22:40 | 4325 | ECR_ENV_60 | | | camera | 38 | 522587 | 6397148 | 522593 | 6397194 | -6 | -47 | 47 | 8 | | (Corr'd Nav, Kongsberg 14208, img#131) (V) (T.A) |
| 19-May-2023 | 22:41 | 4326 | ECR_ENV_60 | | | camera | 38 | 522588 | 6397142 | 522593 | 6397194 | -5 | -52 | 53 | 6 | | (Corr'd Nav, Kongsberg 14208, img#132) (V) (T.A) |
| 19-May-2023 | 22:41 | 4327 | ECR_ENV_60 | | | camera | 38 | 522587 | 6397139 | 522593 | 6397194 | -6 | -56 | 56 | 6 | | (Corr'd Nav, Kongsberg 14208, img#133) (V) (T.A) |
| 19-May-2023 | 22:41 | 4328 | ECR_ENV_60 | | | camera | 38 | 522590 | 6397134 | 522593 | 6397194 | -3 | -60 | 60 | 3 | | (Corr'd Nav, Kongsberg 14208, img#134) (V) (T.A) |
| 19-May-2023 | 22:42 | 4329 | ECR_ENV_60 | | | camera | 38 | 522589 | 6397127 | 522593 | 6397194 | -4 | -68 | 68 | 3 | | (Corr'd Nav, Kongsberg 14208, img#135) (V) (T.A) |
| 19-May-2023 | 22:43 | 4330 | ECR_ENV_60 | | | camera | 38 | 522588 | 6397123 | 522593 | 6397194 | -5 | -71 | 71 | 4 | | (Corr'd Nav, Kongsberg 14208, img#136) (V) (T.A) |
| 19-May-2023 | 22:43 | 4331 | ECR_ENV_60 | | | camera | 38 | 522590 | 6397122 | 522593 | 6397194 | -3 | -72 | 72 | 3 | | (Corr'd Nav, Kongsberg 14208, img#137) (V) (T.A) |
| 19-May-2023 | 22:43 | 4332 | ECR_ENV_60 | | | camera | 38 | 522591 | 6397118 | 522593 | 6397194 | -2 | -76 | 76 | 2 | | (Corr'd Nav, Kongsberg 14208, img#138) (V) (T.A) |
| 19-May-2023 | 22:43 | 4333 | ECR_ENV_60 | | | camera | 38 | 522591 | 6397116 | 522593 | 6397194 | -2 | -79 | 79 | 1 | | (Corr'd Nav, Kongsberg 14208, img#139) (V) (T.A) |
| 19-May-2023 | 22:44 | 4334 | ECR_ENV_60 | | | camera | 38 | 522592 | 6397114 | 522593 | 6397194 | -1 | -80 | 80 | 1 | | (Corr'd Nav, Kongsberg 14208, img#140) (V) (T.A) |
| 19-May-2023 | 22:44 | 4335 | ECR_ENV_60 | | | camera | 38 | 522593 | 6397113 | 522593 | 6397194 | 0 | -82 | 82 | 0 | | (Corr'd Nav, Kongsberg 14208, img#141) (V) (T.A) |
| 19-May-2023 | 22:44 | 4336 | ECR_ENV_60 | | | camera | 38 | 522594 | 6397112 | 522593 | 6397194 | 1 | -82 | 82 | -1 | | (Corr'd Nav, Kongsberg 14208, img#142) (V) (T.A) |
| 19-May-2023 | 22:45 | 4337 | ECR_ENV_60 | | | camera | 38 | 522599 | 6397106 | 522593 | 6397194 | 6 | -89 | 89 | -4 | | (Corr'd Nav, Kongsberg 14208, img#143) (V) (T.A) |
| 19-May-2023 | 22:45 | 4338 | ECR_ENV_60 | | | camera | 38 | 522600 | 6397105 | 522593 | 6397194 | 7 | -89 | 90 | -5 | | (Corr'd Nav, Kongsberg 14208, img#144) (V) (T.A) |
| 20-May-2023 | 02:42:49 | 4339 | ECR_ENV_64 | | | camera | 66 | 525502 | 6419161 | 525481 | 6419113 | 22 | 49 | 53 | 24 | | (Raw Nav, Kongsberg 14208, img#1) (B) |
| 20-May-2023 | 02:43:09 | 4340 | ECR_ENV_64 | | | camera | 66 | 525502 | 6419161 | 525481 | 6419113 | 21 | 49 | 53 | 24 | | (Raw Nav, Kongsberg 14208, img#2) (B) |
| 20-May-2023 | 03:03:42 | 4341 | ECR_ENV_64 | | | camera | 65 | 525489 | 6419167 | 525481 | 6419113 | 8 | 54 | 55 | 9 | | (Raw Nav, Kongsberg 14208, no img) (B) no image |
| 20-May-2023 | 03:03:51 | 4342 | ECR_ENV_64 | | | camera | 65 | 525489 | 6419167 | 525481 | 6419113 | 8 | 54 | 55 | 9 | | (Raw Nav, Kongsberg 14208, no img) (B) no image |
| 20-May-2023 | 03:04 | 4343 | ECR_ENV_64 | | | camera | 64 | 525488 | 6419166 | 525481 | 6419113 | 8 | 53 | 54 | -172 | | (Corr'd Nav, Kongsberg 14208, img#3) (B) (T.A) |
| 20-May-2023 | 03:08:01 | 4344 | ECR_ENV_64 | | | camera | 65 | 525488 | 6419167 | 525481 | 6419113 | 7 | 54 | 54 | 8 | | (Raw Nav, Kongsberg 14208, img#4) (B) |
| 20-May-2023 | 03:08:14 | 4345 | ECR_ENV_64 | | | camera | 65 | 525487 | 6419166 | 525481 | 6419113 | 6 | 53 | 54 | 7 | | (Raw Nav, Kongsberg 14208, img#5) (B) |
| 20-May-2023 | 03:08:59 | 4346 | ECR_ENV_64 | | | camera | 65 | 525486 | 6419161 | 525481 | 6419113 | 6 | 48 | 49 | 7 | | (Raw Nav, Kongsberg 14208, img#6) (B) |
| 20-May-2023 | 03:12:21 | 4347 | ECR_ENV_64 | | | camera | 66 | 525481 | 6419166 | 525481 | 6419113 | 1 | 53 | 53 | 1 | | (Raw Nav, Kongsberg 14208, img#7) (B) |
| 20-May-2023 | 03:13:34 | 4348 | ECR_ENV_64 | | | camera | 65 | 525480 | 6419156 | 525481 | 6419113 | 0 | 43 | 43 | 360 | | (Raw Nav, Kongsberg 14208, img#8) (B) |
| 20-May-2023 | 03:14:21 | 4349 | ECR_ENV_64 | | | camera | 65 | 525481 | 6419148 | 525481 | 6419113 | 1 | 36 | 36 | 1 | | (Raw Nav, Kongsberg 14208, img#9) (B) |
| 20-May-2023 | 03:14:40 | 4350 | ECR_ENV_64 | | | camera | 65 | 525481 | 6419146 | 525481 | 6419113 | 1 | 33 | 33 | 1 | | (Raw Nav, Kongsberg 14208, img#10) (B) |
| 20-May-2023 | 03:15:25 | 4351 | ECR_ENV_64 | | | camera | 64 | 525481 | 6419139 | 525481 | 6419113 | 1 | 26 | 26 | 2 | | (Raw Nav, Kongsberg 14208, img#11) (B) |
| 20-May-2023 | 03:16:13 | 4352 | ECR_ENV_64 | | | camera | 64 | 525481 | 6419131 | 525481 | 6419113 | 1 | 19 | 19 | 2 | | (Raw Nav, Kongsberg 14208, img#12) (B) |
| 20-May-2023 | 03:17:09 | 4353 | ECR_ENV_64 | | | camera | 63 | 525482 | 6419123 | 525481 | 6419113 | 1 | 10 | 10 | 5 | | (Raw Nav, Kongsberg 14208, img#13) (B) |

# APPENDIX B FIELD SAMPLING LOGS

Seafloor Sampling Positioning Summary

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | | Vessel | MV *Ocean Endeavour* | | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | | Vessel Reference Point (VRP) | COG | | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 | |
| Primary Positioning System | Starpack 1 | | | | Actual Coordinates derived from | Vessel | | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | | Projection | UTM zone 30N | | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 20-May-2023 | 03:17:18 | 4354 | ECR_ENV_64 | | | camera | 63 | 525482 | 6419121 | 525481 | 6419113 | 1 | 9 | 9 | 6 | | (Raw Nav, Kongsberg 14208, img#14) (B) |
| 20-May-2023 | 03:17:34 | 4355 | ECR_ENV_64 | | | camera | 63 | 525482 | 6419119 | 525481 | 6419113 | 1 | 7 | 7 | 9 | | (Raw Nav, Kongsberg 14208, img#15) (B) |
| 20-May-2023 | 03:17:40 | 4356 | ECR_ENV_64 | | | camera | 63 | 525482 | 6419118 | 525481 | 6419113 | 1 | 6 | 6 | 11 | | (Raw Nav, Kongsberg 14208, img#16) (B) |
| 20-May-2023 | 03:18:05 | 4357 | ECR_ENV_64 | | | camera | 63 | 525482 | 6419115 | 525481 | 6419113 | 2 | 3 | 3 | 34 | | (Raw Nav, Kongsberg 14208, img#17) (B) |
| 20-May-2023 | 03:18:26 | 4358 | ECR_ENV_64 | | | camera | 63 | 525483 | 6419112 | 525481 | 6419113 | 3 | -1 | 3 | 102 | | (Raw Nav, Kongsberg 14208, img#18) (B) |
| 20-May-2023 | 03:18:33 | 4359 | ECR_ENV_64 | | | camera | 63 | 525484 | 6419111 | 525481 | 6419113 | 3 | -1 | 3 | 114 | | (Raw Nav, Kongsberg 14208, img#19) (B) |
| 20-May-2023 | 03:18:47 | 4360 | ECR_ENV_64 | | | camera | 63 | 525484 | 6419109 | 525481 | 6419113 | 4 | -4 | 5 | 136 | | (Raw Nav, Kongsberg 14208, img#20) (B) |
| 20-May-2023 | 03:18:54 | 4361 | ECR_ENV_64 | | | camera | 63 | 525484 | 6419108 | 525481 | 6419113 | 4 | -5 | 6 | 141 | | (Raw Nav, Kongsberg 14208, img#21) (B) |
| 20-May-2023 | 03:19:03 | 4362 | ECR_ENV_64 | | | camera | 63 | 525485 | 6419107 | 525481 | 6419113 | 4 | -6 | 7 | 145 | | (Raw Nav, Kongsberg 14208, img#22) (B) |
| 20-May-2023 | 03:19:58 | 4363 | ECR_ENV_64 | | | camera | 63 | 525485 | 6419099 | 525481 | 6419113 | 4 | -14 | 14 | 164 | | (Raw Nav, Kongsberg 14208, img#23) (B) |
| 20-May-2023 | 03:20:43 | 4364 | ECR_ENV_64 | | | camera | 64 | 525484 | 6419093 | 525481 | 6419113 | 3 | -20 | 20 | 171 | | (Raw Nav, Kongsberg 14208, img#24) (B) |
| 20-May-2023 | 03:22:01 | 4365 | ECR_ENV_64 | | | camera | 65 | 525481 | 6419083 | 525481 | 6419113 | 0 | -30 | 30 | 179 | | (Raw Nav, Kongsberg 14208, img#25) (B) |
| 20-May-2023 | 03:22:52 | 4366 | ECR_ENV_64 | | | camera | 66 | 525480 | 6419075 | 525481 | 6419113 | -1 | -37 | 37 | 182 | | (Raw Nav, Kongsberg 14208, img#26) (B) |
| 20-May-2023 | 03:23:36 | 4367 | ECR_ENV_64 | | | camera | 67 | 525479 | 6419069 | 525481 | 6419113 | -1 | -44 | 44 | 182 | | (Raw Nav, Kongsberg 14208, img#27) (B) |
| 20-May-2023 | 03:23:56 | 4368 | ECR_ENV_64 | | | camera | 67 | 525479 | 6419066 | 525481 | 6419113 | -1 | -47 | 47 | 182 | | (Raw Nav, Kongsberg 14208, img#28) (B) |
| 20-May-2023 | 03:24:44 | 4369 | ECR_ENV_64 | | | camera | 67 | 525479 | 6419062 | 525481 | 6419113 | -2 | -51 | 51 | 182 | | (Raw Nav, Kongsberg 14208, img#29) (B) |
| 20-May-2023 | 03:24:55 | 4370 | ECR_ENV_64 | | | camera | 67 | 525479 | 6419061 | 525481 | 6419113 | -2 | -52 | 52 | 182 | | (Raw Nav, Kongsberg 14208, img#30) (B) |
| 20-May-2023 | 03:25:33 | 4371 | ECR_ENV_64 | | | camera | 67 | 525480 | 6419055 | 525481 | 6419113 | -1 | -58 | 58 | 181 | | (Raw Nav, Kongsberg 14208, img#31) (B) |
| 20-May-2023 | 03:26:42 | 4372 | ECR_ENV_64 | | | camera | 67 | 525481 | 6419049 | 525481 | 6419113 | 1 | -64 | 64 | 179 | | (Raw Nav, Kongsberg 14208, img#32) (B) |
| 20-May-2023 | 03:26:52 | 4373 | ECR_ENV_64 | | | camera | 67 | 525482 | 6419048 | 525481 | 6419113 | 1 | -65 | 65 | 179 | | (Raw Nav, Kongsberg 14208, img#33) (B) |
| 20-May-2023 | 03:27:29 | 4374 | ECR_ENV_64 | | | camera | 67 | 525483 | 6419044 | 525481 | 6419113 | 2 | -69 | 69 | 178 | | (Raw Nav, Kongsberg 14208, img#34) (B) |
| 20-May-2023 | 03:27:54 | 4375 | ECR_ENV_64 | | | camera | 67 | 525483 | 6419041 | 525481 | 6419113 | 3 | -72 | 72 | 178 | | (Raw Nav, Kongsberg 14208, img#35) (B) |
| 20-May-2023 | 04:19:39 | 4376 | ECR_ENV_63 | | | camera | 60 | 525796 | 6420133 | 525481 | 6419113 | 315 | 1020 | 66 | 290 | | (Raw Nav, Kongsberg 14208, img#36) (B) |
| 20-May-2023 | 04:20:05 | 4377 | ECR_ENV_63 | | | camera | 61 | 525800 | 6420134 | 525858 | 6420111 | -58 | 23 | 62 | 292 | | (Raw Nav, Kongsberg 14208, img#37) (B) |
| 20-May-2023 | 04:20:35 | 4378 | ECR_ENV_63 | | | camera | 60 | 525804 | 6420133 | 525858 | 6420111 | -54 | 22 | 59 | 293 | | (Raw Nav, Kongsberg 14208, img#38) (B) |
| 20-May-2023 | 04:21:16 | 4379 | ECR_ENV_63 | | | camera | 61 | 525810 | 6420132 | 525858 | 6420111 | -49 | 21 | 53 | 294 | | (Raw Nav, Kongsberg 14208, img#39) (B) |
| 20-May-2023 | 04:21:29 | 4380 | ECR_ENV_63 | | | camera | 61 | 525811 | 6420132 | 525858 | 6420111 | -47 | 21 | 52 | 294 | | (Raw Nav, Kongsberg 14208, img#40) (B) |
| 20-May-2023 | 04:22:16 | 4381 | ECR_ENV_63 | | | camera | 61 | 525817 | 6420130 | 525858 | 6420111 | -41 | 19 | 45 | 295 | | (Raw Nav, Kongsberg 14208, img#41) (B) |
| 20-May-2023 | 04:22:58 | 4382 | ECR_ENV_63 | | | camera | 61 | 525823 | 6420128 | 525858 | 6420111 | -35 | 17 | 39 | 296 | | (Raw Nav, Kongsberg 14208, img#42) (B) |
| 20-May-2023 | 04:23:09 | 4383 | ECR_ENV_63 | | | camera | 61 | 525825 | 6420127 | 525858 | 6420111 | -33 | 16 | 37 | 296 | | (Raw Nav, Kongsberg 14208, img#43) (B) |
| 20-May-2023 | 04:23:52 | 4384 | ECR_ENV_63 | | | camera | 61 | 525830 | 6420124 | 525858 | 6420111 | -28 | 14 | 31 | 296 | | (Raw Nav, Kongsberg 14208, img#44) (B) |
| 20-May-2023 | 04:24:10 | 4385 | ECR_ENV_63 | | | camera | 60 | 525833 | 6420123 | 525858 | 6420111 | -26 | 12 | 28 | 295 | | (Raw Nav, Kongsberg 14208, img#45) (B) |
| 20-May-2023 | 04:24:45 | 4386 | ECR_ENV_63 | | | camera | 60 | 525837 | 6420121 | 525858 | 6420111 | -21 | 10 | 24 | 296 | | (Raw Nav, Kongsberg 14208, img#46) (B) |
| 20-May-2023 | 04:25:06 | 4387 | ECR_ENV_63 | | | camera | 60 | 525839 | 6420120 | 525858 | 6420111 | -19 | 9 | 21 | 296 | | (Raw Nav, Kongsberg 14208, img#47) (B) |
| 20-May-2023 | 04:25:46 | 4388 | ECR_ENV_63 | | | camera | 60 | 525845 | 6420118 | 525858 | 6420111 | -13 | 8 | 16 | 300 | | (Raw Nav, Kongsberg 14208, img#48) (B) |
| 20-May-2023 | 04:25:53 | 4389 | ECR_ENV_63 | | | camera | 60 | 525845 | 6420118 | 525858 | 6420111 | -13 | 7 | 15 | 300 | | (Raw Nav, Kongsberg 14208, img#49) (B) |
| 20-May-2023 | 04:26:01 | 4390 | ECR_ENV_63 | | | camera | 60 | 525847 | 6420118 | 525858 | 6420111 | -11 | 7 | 13 | 302 | | (Raw Nav, Kongsberg 14208, img#50) (B) |
| 20-May-2023 | 04:26:15 | 4391 | ECR_ENV_63 | | | camera | 60 | 525849 | 6420117 | 525858 | 6420111 | -9 | 6 | 11 | 303 | | (Raw Nav, Kongsberg 14208, img#51) (B) |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | | Vessel | MV *Ocean Endeavour* | | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | | Vessel Reference Point (VRP) | COG | | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 | |
| Primary Positioning System | Starpack 1 | | | | Actual Coordinates derived from | Vessel | | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | | Projection | UTM zone 30N | | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 20-May-2023 | 04:26:40 | 4392 | ECR_ENV_63 | | | camera | 60 | 525851 | 6420115 | 525858 | 6420111 | -7 | 5 | 8 | 304 | | (Raw Nav, Kongsberg 14208, img#52) (B) |
| 20-May-2023 | 04:27:12 | 4393 | ECR_ENV_63 | | | camera | 60 | 525856 | 6420114 | 525858 | 6420111 | -3 | 3 | 4 | 322 | | (Raw Nav, Kongsberg 14208, img#53) (B) |
| 20-May-2023 | 04:27:37 | 4394 | ECR_ENV_63 | | | camera | 60 | 525859 | 6420113 | 525858 | 6420111 | 1 | 2 | 2 | 23 | | (Raw Nav, Kongsberg 14208, img#54) (B) |
| 20-May-2023 | 04:27:56 | 4395 | ECR_ENV_63 | | | camera | 60 | 525861 | 6420112 | 525858 | 6420111 | 3 | 1 | 4 | 71 | | (Raw Nav, Kongsberg 14208, img#55) (B) |
| 20-May-2023 | 04:28:28 | 4396 | ECR_ENV_63 | | | camera | 61 | 525865 | 6420110 | 525858 | 6420111 | 7 | -1 | 7 | 95 | | (Raw Nav, Kongsberg 14208, img#56) (B) |
| 20-May-2023 | 04:28:46 | 4397 | ECR_ENV_63 | | | camera | 61 | 525867 | 6420109 | 525858 | 6420111 | 9 | -1 | 9 | 98 | | (Raw Nav, Kongsberg 14208, img#57) (B) |
| 20-May-2023 | 04:29:18 | 4398 | ECR_ENV_63 | | | camera | 61 | 525871 | 6420108 | 525858 | 6420111 | 13 | -3 | 14 | 102 | | (Raw Nav, Kongsberg 14208, img#58) (B) |
| 20-May-2023 | 04:30:18 | 4399 | ECR_ENV_63 | | | camera | 62 | 525878 | 6420104 | 525858 | 6420111 | 20 | -7 | 21 | 110 | | (Raw Nav, Kongsberg 14208, img#59) (B) |
| 20-May-2023 | 04:30:42 | 4400 | ECR_ENV_63 | | | camera | 62 | 525880 | 6420102 | 525858 | 6420111 | 22 | -8 | 23 | 111 | | (Raw Nav, Kongsberg 14208, img#60) (B) |
| 20-May-2023 | 04:31:01 | 4401 | ECR_ENV_63 | | | camera | 62 | 525882 | 6420101 | 525858 | 6420111 | 24 | -10 | 26 | 113 | | (Raw Nav, Kongsberg 14208, img#61) (B) |
| 20-May-2023 | 04:31:40 | 4402 | ECR_ENV_63 | | | camera | 63 | 525885 | 6420097 | 525858 | 6420111 | 27 | -13 | 30 | 116 | | (Raw Nav, Kongsberg 14208, img#62) (B) |
| 20-May-2023 | 04:32:22 | 4403 | ECR_ENV_63 | | | camera | 63 | 525888 | 6420094 | 525858 | 6420111 | 30 | -17 | 35 | 119 | | (Raw Nav, Kongsberg 14208, img#63) (B) |
| 20-May-2023 | 04:32:46 | 4404 | ECR_ENV_63 | | | camera | 63 | 525891 | 6420091 | 525858 | 6420111 | 33 | -19 | 38 | 121 | | (Raw Nav, Kongsberg 14208, img#64) (B) |
| 20-May-2023 | 04:33:47 | 4405 | ECR_ENV_63 | | | camera | 63 | 525898 | 6420086 | 525858 | 6420111 | 40 | -25 | 47 | 122 | | (Raw Nav, Kongsberg 14208, img#65) (B) |
| 20-May-2023 | 04:34:10 | 4406 | ECR_ENV_63 | | | camera | 63 | 525901 | 6420084 | 525858 | 6420111 | 43 | -27 | 51 | 122 | | (Raw Nav, Kongsberg 14208, img#66) (B) |
| 20-May-2023 | 04:34:16 | 4407 | ECR_ENV_63 | | | camera | 63 | 525902 | 6420083 | 525858 | 6420111 | 44 | -28 | 52 | 122 | | (Raw Nav, Kongsberg 14208, img#67) (B) |
| 20-May-2023 | 04:34:40 | 4408 | ECR_ENV_63 | | | camera | 64 | 525904 | 6420080 | 525858 | 6420111 | 46 | -31 | 55 | 124 | | (Raw Nav, Kongsberg 14208, img#68) (B) |
| 20-May-2023 | 04:35:06 | 4409 | ECR_ENV_63 | | | camera | 64 | 525907 | 6420077 | 525858 | 6420111 | 48 | -34 | 59 | 125 | | (Raw Nav, Kongsberg 14208, img#69) (B) |
| 20-May-2023 | 04:35:45 | 4410 | ECR_ENV_63 | | | camera | 64 | 525912 | 6420075 | 525858 | 6420111 | 54 | -36 | 65 | 124 | | (Raw Nav, Kongsberg 14208, img#70) (B) |
| 20-May-2023 | 04:36:09 | 4411 | ECR_ENV_63 | | | camera | 64 | 525916 | 6420074 | 525858 | 6420111 | 58 | -37 | 68 | 122 | | (Raw Nav, Kongsberg 14208, img#71) (B) |
| 20-May-2023 | 04:36:56 | 4412 | ECR_ENV_63 | | | camera | 64 | 525919 | 6420071 | 525858 | 6420111 | 61 | -40 | 73 | 123 | | (Raw Nav, Kongsberg 14208, img#72) (B) |

# APPENDIX B FIELD SAMPLING LOGS

| SEABED IMAGERY LOG SHEET (Deck) | | | | | | | | | | | | | FOR-ENV-0538 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No: | 54463 | | Area: | North Sea | | | | Scale: Green Lasers Lines (99mm) | | | | | |
| Project: | Caledonia OWF Phase 2 | | | | | | | Equipment: 1Cam / OE14-208 / CT3022 | | | | | |
| Client: | Caledonia Offshore Windfarm Limited | | | | | | | Vessel: MV *Ocean Endeavour* | | | | | |
| Station Number | Date | Time on Overlay Start | Time on Overlay Finish | Duration | HD Video HDD File Name(s) | Topside SD Video File Name (s) | Sediment Description | Fauna Description | Operator(s) | No. of Photos | First Fix No. | Last Fix No. | Comments |
| ECR_ENV_39 | 19-Mar-2023 | 13:39:13 | 13:59:01 | 0:19:48 | 54463_ECR_ENV_39 00002.MTS | 54463_ECR_ENV_39_2023-03-19_133913_Ch1/2_00 | Fine sand with occasional shell fragments, cobbles and boulders | Annelida (Polychaeta), Arthropoda (Galatheoidea, Paguroidea), Chordata (Actinopterygii, Pleuronectiformes), Echinodermata (Echinoidea), Mollusca (Bivalvia) | RH, MC | 46 | 1 | 46 | |
| ECR_ENV_38 | 19-Mar-2023 | 15:08:57 | 15:23:28 | 0:14:31 | 54463_ECR_ENV_38 00003.MTS | 54463_ECR_ENV_38_2023-03-19_150857_Ch1/2_00 | Fine sand with occasional shell fragments | Annelida (Polychaeta), Arthropoda (Brachyura, Galatheoidea, Paguroidea), Chordata (Ascidiacea, Triglidae), Cnidaria (Anthozoa, Hydrozoa, *P. phosphorea* ), Mollusca (Bivalvia, Gastropoda) | RH, MC | 46 | 47 | 92 | Issue with C-Tecnics camera, some images out of focus |
| ECR_ENV_37 | 19-Mar-2023 | 16:21:42 | 16:37:08 | 0:15:26 | 54463_ECR_ENV_37 - 01/02 00004.MTS 00005.MTS | 54463_ECR_ENV_37_2023-03-19_162142_Ch1/2_00 | Fine sand with occasional shell fragments and faunal burrows | Annelida (Polychaeta), Arthropoda (Paguroidea), Chordata (Actinopterygii), Cnidaria *(P. phosphorea* ) | RH, MC | 39 | 93 | 135 | Issue with camera flash for first six images |
| ECR_ENV_51 | 19-Mar-2023 | 17:56:24 | 18:08:48 | 0:12:24 | 54463_ECR_ENV_51 00006.MTS | 54463_ECR_ENV_51_2023-03-19_175624_Ch1/2_00 | Fine sand with occasional shell fragments and faunal burrows | Arthropoda (*N. norvegicus* ), Chordata (Actinopterygii), Cnidaria (*P. phosphorea* , *Tubularia),* Mollusca | RH, MC | 39 | 136 | 174 | |
| ECR_ENV_52 | 19-Mar-2023 | 19:16:49 | 19:29:36 | 00:12:47 | 54463_ECR_ENV_52 00007.MTS | 54463_ECR_ENV_52_2023-03-19_191649_Ch1/2_00 | Fine sand with occasional shell fragments and faunal burrows | Chordata (Actinopterygii, Gadidae), Cnidaria (*P. phosphorea* , *Tubularia* ), Echinodermata (*Ophiura* ) | RH, MC | 38 | 175 | 215 | Issue with topside SD Ch2 video |
| ECR_ENV_50 | 19-Mar-2023 | 20:49:18 | 21:04:56 | 00:15:38 | 54463_ECR_ENV_50 00008.MTS | 54463_ECR_ENV_50_2023-03-19_204918_Ch1/2_00 | Fine sand with occasional shell fragments and faunal burrows | Arthropoda, Chordata (Actinopterygii, Pleuronectiformes), Cnidaria (*Tubularia* ), Echinodermata (*Henricia* ) | RH, MC | 43 | 216 | 258 | |
| ECR_ENV_49 | 19-Mar-2023 | 22:11:05 | 22:29:00 | 00:17:55 | 54463_ECR_ENV_49 00009.MTS | 54463_ECR_ENV_49_2023-03-19_221105_Ch1/2_00 | Fine sand with occasional shell fragments and faunal burrows | Chordata (Actinopterygii, Pleuronectiformes), Cnidaria (Hydrozoa, *P. phosphorea* ) | RH, MC | 41 | 259 | 299 | |

# APPENDIX B FIELD SAMPLING LOGS

| SEABED IMAGERY LOG SHEET (Deck) | | | | | | | | | | | | | FOR-ENV-0538 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No: | 54463 | | Area: | North Sea | | | | Scale: Green Lasers Lines (99mm) | | | | | |
| Project: | Caledonia OWF Phase 2 | | | | | | | Equipment: 1Cam / OE14-208 / CT3022 | | | | | |
| Client: | Caledonia Offshore Windfarm Limited | | | | | | | Vessel: MV *Ocean Endeavour* | | | | | |
| Station Number | Date | Time on Overlay Start | Time on Overlay Finish | Duration | HD Video HDD File Name(s) | Topside SD Video File Name (s) | Sediment Description | Fauna Description | Operator(s) | No. of Photos | First Fix No. | Last Fix No. | Comments |
| ECR_ENV_48 | 19-Mar-2023 | 23:31:27 | 23:42:40 | 00:11:13 | 54463_ECR_ENV_48 00010.MTS | 54463_ECR_ENV_48_2023-03-19_233127_Ch1/2_00 | Fine sand with occasional shell fragments and faunal burrows | Annelida (Sabellidae), Arthropoda (*G. rhomboides* , Nephropidae), Chordata (Actinopterygii), Cnidaria (Hydrozoa, *P. phosphorea* , *Tubularia)* | RH, MC | 39 | 300 | 338 | |
| ECR_ENV_47 | 20-Mar-2023 | 01:02:15 | 01:17:16 | 00:15:01 | 54463_ECR_ENV_47 00011.MTS | 54463_ECR_ENV_47_2023-03-20_010215_Ch1/2_00 | Fine sand with occasional shell fragments and faunal burrows | Arthropoda (Paguroidea), Chordata (Actinopterygii), Cnidaria (*P. phosphorea* ) | MJ, JH | 36 | 339 | 374 | |
| ECR_ENV_46 | 20-Mar-2023 | 02:33:19 | 02:47:36 | 00:14:17 | 54463_ECR_ENV_46 00012.MTS | 54463_ECR_ENV_46_2023-03-20_023319_Ch1/2_00 | Fine sand with occasional shell fragments and faunal burrows | Arthropoda (*C. pagurus,* Nephropidae), Chordata (Actinopterygii, Pleuronectiformes), Cnidaria (*P. phosphorea* , *Virgularia* ) | MJ, JH | 48 | 375 | 422 | |
| ECR_ENV_45 | 20-Mar-2023 | 04:05:40 | 04:20:33 | 00:14:53 | 54463_ECR_ENV_45 00013.MTS | 54463_ECR_ENV_45_2023-03-20_040540_Ch1/2_00 | Fine sand with occasional shell fragments and faunal burrows | Arthropoda (*N. norvegicus* ), Chordata (Actinopterygii, Pleuronectiformes), Cnidaria (*P. phosphorea* , *Tubularia, Virgularia* ) | MJ, JH | 38 | 423 | 460 | |
| ECR_ENV_44 | 20-Mar-2023 | 05:32:03 | 05:47:54 | 00:15:51 | 54463_ECR_ENV_44 00014.MTS | 54463_ECR_ENV_44_2023-03-20_053202_Ch1/2_00 | Fine sand with occasional shell fragments and faunal burrows | Chordata (Actinopterygii), Cnidaria (Hydrozoa, *P. phosphorea* , *Tubularia)* | MJ, JH | 40 | 460 | 500 | |
| ECR_ENV_43 | 20-Mar-2023 | 07:31:35 | 07:48:43 | 00:17:08 | 54463_ECR_ENV_43 00015.MTS | 54463_ECR_ENV_43_2023-03-20_073135_Ch1/2_00 | Fine sand with occasional shell fragments, cobbles, boulders and faunal burrows | Annelida (Sabellidae), Arthropoda (Decapoda, Galatheoidea, *N. norvegicus* , Paguroidea), Chordata (Actinopterygii, Pleuronectiformes), Cnidaria (Actinaria, Hydrozoa, *P. phosphorea* , *Tubularia* ), Echinodermata (Asteroidea, Echinoidea, Henricia), Mollusca (Gastropoda, Scaphopoda) | MJ, JH | 60 | 501 | 560 | |
| ECR_ENV_42 | 20-Mar-2023 | 09:37:49 | 09:51:26 | 00:13:37 | 54463_ECR_ENV_42 00016.MTS | 54463_ECR_ENV_42_2023-03-20_093749_Ch1/2_00 | Fine sand with occasional shell fragments and faunal burrows | Arthropoda (*N. norvegicus* ), Chordata (Pleuronectiformes), Cnidaria (*P. phosphorea* ) | MJ, JH | 39 | 561 | 599 | |

# APPENDIX B FIELD SAMPLING LOGS

| SEABED IMAGERY LOG SHEET (Deck) | | | | | | | | | | | | | FOR-ENV-0538 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No: | 54463 | | Area: | North Sea | | | | Scale: Green Lasers Lines (99mm) | | | | | |
| Project: | Caledonia OWF Phase 2 | | | | | | | Equipment: 1Cam / OE14-208 / CT3022 | | | | | |
| Client: | Caledonia Offshore Windfarm Limited | | | | | | | Vessel: MV *Ocean Endeavour* | | | | | |
| Station Number | Date | Time on Overlay Start | Time on Overlay Finish | Duration | HD Video HDD File Name(s) | Topside SD Video File Name (s) | Sediment Description | Fauna Description | Operator(s) | No. of Photos | First Fix No. | Last Fix No. | Comments |
| ECR_ENV_41 | 20-Mar-2023 | 11:20:51 | 11:31:32 | 00:10:41 | 54463_ECR_ENV_41 00017.MTS | 54463_ECR_ENV_41_2023-03-20_112051_Ch1/2_00 | Fine sand with occasional shell fragments and faunal burrows | Chordata (Actinopterygii), Cnidaria (*P. phosphorea, Virgularia* ) | MJ, JH | 39 | 600 | 639 | |
| ECR_ENV_40 | 20-Mar-2023 | 13:14:56 | 13:31:56 | 00:17:00 | 54463_ECR_ENV_40 00018.MTS | 54463_ECR_ENV_40_2023-03-20_131456_Ch1/2_00 | Fine sand with occasional shell fragments and faunal burrows | Chordata (Actinopterygii), Cnidaria (*P. phosphorea* ), Echinodermata, (*Henricia* ) | RH, MC | 41 | 640 | 681 | Bow thruster failure |
| ECR_ENV_08 | 29-Mar-2023 | 14:49:18 | 15:08:10 | 00:18:52 | 54463_ECR_ENV_08 00000.MTS | 54463_ECR_ENV_08_2023-03-29_144918_Ch1/2_00 | Fine sand with ripples and occasional shell fragments | Arthropoda (Paguroidea), Chordata (Actinopterygii, *Callionymus* , Pleuronectiformes), Cnidaria (*P. phosphorea* ), Mollusca (*A. islandica* , Bivalvia, Gastropoda) | MJ, JH | 45 | 682 | 726 | Presence of *Arctica islandica* |
| ECR_ENV_15 | 30-Mar-2023 | 01:56:02 | 02:10:18 | 00:14:16 | 54463_ECR_ENV_15 00001.MTS | 54463_ECR_ENV_15_2023-03-30_015602_Ch1/2_00 | Fine sand with occasional shell fragments | Chordata (Actinopterygii, Pleuronectiformes, Triglidae), Cnidaria (Anthozoa), Mollusca (*A. islandica* , Bivalvia, Pectinidae) | MJ, JH | 43 | 727 | 769 | Presence of *Arctica islandica* |
| ECR_ENV_20 | 30-Mar-2023 | 03:50:13 | 04:04:49 | 00:14:36 | 54463_ECR_ENV_20 00002.MTS | 54463_ECR_ENV_20_2023-03-30_035013_Ch1/2_00 | Fine sand with occasional shell fragments, cobbles and boulders | Arthropoda (Caridea, Brachyura, Galatheoidea), Chordata (Actinopterygii), Cnidaria (*A. digitatum* , Metridium), Echinodermata (Asteroidea, Echinoidea, *Henricia* ) | MJ, JH | 46 | 770 | 815 | |
| ECR_ENV_07 | 30-Mar-2023 | 06:37:34 | 07:01:56 | 00:24:22 | 54463_ECR_ENV_07 00003.MTS | 54463_ECR_ENV_07_2023-03-30_063734_Ch1/2_00 | Fine sand with occasional shell fragments | Chordata (Actinopterygii, Pleuronectiformes), Echinodermata (Asteroidea, *Henricia* ) | MJ, JH | 70 | 816 | 885 | Issue with EELS, photo taken but no fix 865 to 875 |
| ECR_ENV_16 | 02-Apr-2023 | 12:35:23 | 12:49:14 | 00:13:51 | 54463_ECR_ENV_16 00000.MTS | 54463_ECR_ENV_16_2023-04-02_123523_Ch1/2_00 | Fine sand with occasional shell fragments | Chordata (Actinopterygii), Echinodermata (Asteroidea) | RH, MC | 43 | 886 | 928 | Large swell |
| ECR_ENV_25 | 02-Apr-2023 | 14:48:21 | 15:03:14 | 00:14:53 | 54463_ECR_ENV_25 00001.MTS | 55463_ECR_ENV_25_2023-04-02_144821_Ch1/2_00 | Fine sand with occasional shell fragments | Chordata (Actinopterygii, Pleuronectiformes), Cnidaria (*P. phosphorea* ), Mollusca (*A. islandica* ) | RH, MC | 43 | 929 | 971 | Presence of *Arctica islandica* Large swell |
| ECR_ENV_33 | 02-Apr-2023 | 16:37:15 | 16:49:53 | 00:12:38 | 54463_ECR_ENV_33 00002.MTS | 55463_ECR_ENV_33_2023-04-02_163715_Ch1/2_00 | Fine sand with occasional shell fragments | Arthropoda (*N. norvegicus* ), Chordata (Actinopterygii, Pleuronectiformes), Cnidaria (*P. phosphorea* ), Echinodermata (Ophiuroidea) | RH, MC | 40 | 972 | 1011 | |

# APPENDIX B FIELD SAMPLING LOGS

| SEABED IMAGERY LOG SHEET (Deck) | | | | | | | | | | | | | FOR-ENV-0538 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No: | 54463 | | Area: | North Sea | | | | Scale: Green Lasers Lines (99mm) | | | | | |
| Project: | Caledonia OWF Phase 2 | | | | | | | Equipment: 1Cam / OE14-208 / CT3022 | | | | | |
| Client: | Caledonia Offshore Windfarm Limited | | | | | | | Vessel: MV *Ocean Endeavour* | | | | | |
| Station Number | Date | Time on Overlay Start | Time on Overlay Finish | Duration | HD Video HDD File Name(s) | Topside SD Video File Name (s) | Sediment Description | Fauna Description | Operator(s) | No. of Photos | First Fix No. | Last Fix No. | Comments |
| ECR_ENV_17 | 03-Apr-2023 | 03:17:41 | 03:34:06 | 00:16:25 | 54463_ECR_ENV_17 00003.MTS | 55463_ECR_ENV_17_2023-04-03_031741_Ch1/2_00 | Fine sand with occasional shell fragments | Annelida (Polychaeta), Chordata (Actinopterygii, Plueronectiformes), Cnidaria (*P. phosphorea* ), Echinodermata (Asteroidea), Mollusca (*A. islandica* , Pectinidae) | MJ, JH | 43 | 1012 | 1055 | Presence of *Arctica islandica* Issue with camera focus |
| ECR_ENV_26 | 03-Apr-2023 | 14:11:13 | 14:24:47 | 00:13:34 | 54463_ECR_ENV_26 00004.MTS | 55463_ECR_ENV_26_2023-04-03_141113_Ch1/2_00 | Fine sand | Arthropoda (Caridea, *N. norvegicus* ), Cnidaria (*P. phosphorea* , *Tubularia* ) | RH, MC | 40 | 1056 | 1094 | |
| ECR_ENV_21 | 04-Apr-2023 | 03:34:58 | 03:50:23 | 00:15:25 | 54463_ECR_ENV_21 00005.MTS | 55463_ECR_ENV_21_2023-04-04_033458_Ch1/2_00 | Fine sand with ripples and occasional shell fragments | Arthropoda (Brachyura, Caridea, Paguroidea), Chordata (Actinopterygii, Pleuronectiformes), Cnidaria (*P. phosphorea* ), Mollusca (*A. islandica* , Bivalvia) | MJ, JH | 40 | 1095 | 1134 | Presence of *Arctica islandica* |
| ECR_ENV_53 | 04-Apr-2023 | 07:35:41 | 07:52:57 | 00:17:16 | 54463_ECR_ENV_53 00006.MTS | 55463_ECR_ENV_53_2023-04-04_073541_Ch1/2_00 | Coarse sand with occasional shell fragments, cobbles and boulders | Annelida (Polychaeta), Arthropoda (*C. pagurus* , Galatheoidea), Bryozoa, Chordata (Pleuronectiformes), Cnidaria (*A. digitatum* ), Echinodermata (*A. rubens, C. papposus* , Echinoidea, *Luidia* ) | MJ, JH | 45 | 1135 | 1179 | |
| ECR_ENV_01 | 04-Apr-2023 | 10:06:57 | 10:22:15 | 00:15:18 | 54463_ECR_ENV_01 00007.MTS | 55463_ECR_ENV_01_2023-04-04_100657_Ch1/2_00 | Coarse sand with occasional shell fragments, cobbles and boulders | Arthropoda, Chordata (Actinopterygii, Pleuronectiformes), Cnidaria (Anthozoa), Echinodermata (Echinoidea, Asteroidea), Mollusca (Bivalvia) | RH, MC | 43 | 1180 | 1222 | |
| ECR_ENV_54 | 04-Apr-2023 | 12:38:02 | 13:11:20 | 00:33:18 | 54463_ECR_ENV_54 00008/9.MTS | 55463_ECR_ENV_54_2023-04-04_123802_Ch1/2_00 55463_ECR_ENV_54_2023-04-04_130802_Ch1/2_01 | Fine sand and very large boulder in centre of target | Arthropoda (Paguroidea, Galatheoidea), Chordata (Actinopterygii, Pleuronectiformes), Cnidaria (Anthozoa), Echinodermata (Echinoidea) | RH, MC | 48 | 1223 | 1275 | Issue with EELs, no fix (1224-1228) |
| ECR_ENV_55 | 04-Apr-2023 | 14:07:54 | 14:44:00 | 00:36:06 | 54463_ECR_ENV_55 00010/11.MTS | 55463_ECR_ENV_55_2023-04-04_140754_Ch1/2_00 55463_ECR_ENV_55_2023-04-04_143754_Ch1/2_01 | Fine sand and very large boulder in centre of target | Arthropoda (Galatheoidea, *N. norvegicus* ), Chordata (Actinopterygii, Pleuronectiformes), Cnidaria (Anthozoa) | RH, MC | 49 | 1276 | 1324 | |

# APPENDIX B FIELD SAMPLING LOGS

| SEABED IMAGERY LOG SHEET (Deck) | | | | | | | | | | | | | FOR-ENV-0538 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No: | 54463 | | Area: | North Sea | | | Scale: Green Lasers Lines (99mm) | | | | | | |
| Project: | Caledonia OWF Phase 2 | | | | | | Equipment: 1Cam / OE14-208 / CT3022 | | | | | | |
| Client: | Caledonia Offshore Windfarm Limited | | | | | | Vessel: MV *Ocean Endeavour* | | | | | | |
| Station Number | Date | Time on Overlay Start | Time on Overlay Finish | Duration | HD Video HDD File Name(s) | Topside SD Video File Name (s) | Sediment Description | Fauna Description | Operator(s) | No. of Photos | First Fix No. | Last Fix No. | Comments |
| ECR_ENV_02 | 04-Apr-2023 | 15:45:59 | 16:01:16 | 00:15:17 | 54463_ECR_ENV_02 00012.MTS | 55463_ECR_ENV_02_2023-04-04_154559_Ch1/2_00 | Fine sand | Arthropoda (*N. norvegicus* ), Chordata (Actinopterygii), Cnidaria (*P. phosphorea* , *Tubularia* ) | RH, MC | 39 | 1325 | 1363 | |
| ECR_ENV_14 | 04-Apr-2023 | 23:06:09 | 23:22:16 | 00:16:07 | 54463_ECR_ENV_14 00000.MTS | 55463_ECR_ENV_14_2023-04-04_230609_Ch1/2_00 | Fine sand with occasional shell fragments, cobbles and boulders | Arthropoda (Brachyura, Galatheoidea, *N. norvegicus* ), Chordata (Actinopterygii, Pleuronectiformes), Cnidaria (*P. phosphorea* ) | MJ, JH | 42 | 1364 | 1405 | |
| ECR_ENV_35 | 05-Apr-2023 | 01:48:42 | 02:01:14 | 00:12:32 | 54463_ECR_ENV_35 00001.MTS | 55463_ECR_ENV_35_2023-04-05_014842_Ch1/2_00 | Fine sand | Arthropoda (Brachyura), Chordata (Actinopterygii, Pleuronectiformes), Cnidaria (Hydrozoa, *P. phosphorea* ) | MJ, JH | 37 | 1406 | 1442 | |
| ECR_ENV_12 | 05-Apr-2023 | 04:01:17 | 04:17:41 | 00:16:24 | 54463_ECR_ENV_12 00002.MTS | 55463_ECR_ENV_12_2023-04-05_040117_Ch1/2_00 | Fine sand | Arthropoda (Galatheoidea), Chordata (Actinopterygii), Cnidaria (Hydrozoa, *P. phosphorea* ) | MJ, JH | 40 | 1443 | 1482 | |
| ECR_ENV_24 | 05-Apr-2023 | 12:35:56 | 12:46:36 | 00:10:40 | 54463_ECR_ENV_24 (1/2) 00003.MTS 00004.MTS | 55463_ECR_ENV_24_2023-04-05_123556_Ch1/2_00 | Fine sand | Chordata (Pleuronectiformes), Cnidaria (*P. phosphorea* ) | RH, MC | 43 | 1489 | 1525 | Break in 1Cam recording |
| ECR_ENV_09 | 05-Apr-2023 | 15:08:26 | 15:16:41 | 00:08:15 | 54463_ECR_ENV_09 00005.MTS | 54463_ECR-ENV_09_2023-04-05_150626_Ch1/2_00 | Fine sand with shell fragments | Chordata (Actinopterygii, Pleuronectiformes), Cnidaria (*P. phosphorea* ) | RH, MC | 40 | 1526 | 1565 | |
| ECR_ENV_27 | 05-Apr-2023 | 16:49:10 | 17:02:40 | 00:13:30 | 54463_ECR_ENV_27 00006.MTS | 54463_ECR_ENV_27_2023-04-05_164910_Ch1/2_00 | Fine sand with shell fragments | Chordata (Actinopterygii), Cnidaria (*P. phosphorea* , *Tubularia* ) | RH, MC | 41 | 1566 | 1608 | |
| ECR_ENV_04 | 05-Apr-2023 | 20:01:44 | 20:16:59 | 00:15:15 | 54463_ECR_ENV_04 00007.MTS | 54463_ECR_ENV_04_2023-04-05_200144_Ch1/2_00 | Fine sand with occasional shell fragments | Arthropoda (Galatheoidea), Chordata (Actinopterygii, Pleuroneciformes), Cnidaria (*P. phosphorea* ), Mollusca (*A. islandica* , Bivalvia) | RH, MC | 45 | 1609 | 1653 | Presence of *Arctica islandica* |
| ECR_ENV_19 | 05-Apr-2023 | 21:49:58 | 22:05:25 | 00:15:27 | 54463_ECR_ENV_19 00008.MTS | 54463_ECR_ENV_19_2023-04-05_214958_Ch1/2_00 | Fine sand with occasional shell fragments | Arthropoda (Brachyura), Chordata (Actinopterygii), Cnidaria (Actiniaria, *P. phosphorea* ) | RH, MC | 46 | 1654 | 1699 | |
| ECR_ENV_23 | 05-Apr-2023 | 23:47:14 | 23:58:45 | 00:11:31 | 54463_ECR_ENV_23 00009.MTS | 54463_ECR_ENV_23_2023-04-05_234714_Ch1/2_00 | Fine sand with occasional shell fragments | Chordata (Actinopterygii, Pleuronectiformes), Cnidaria (*P. phosphorea* ), Echinodermata (Asteroidea) | MJ, JH | 40 | 1700 | 1739 | |
| ECR_ENV_06 | 06-Apr-2023 | 01:40:33 | 01:57:13 | 00:16:40 | 54463_ECR_ENV_06 00010.MTS | 54463_ECR_ENV_06_2023-04-06_014033_Ch1/2_00 | Fine sand with occasional shell fragments | Chordata (Actinopterygii, Pleuronectiformes), Cnidaria (Hydrozoa), Mollusca (*A. islandica* , Bivalvia) | MJ, JH | 42 | 1740 | 1781 | Presence of *Arctica islandica* |
| ECR_ENV_13 | 06-Apr-2023 | 05:30:59 | 05:43:46 | 00:12:47 | 54463_ECR_ENV_13 00011.MTS | 54463_ECR_ENV_13_2023-04-06_053059_Ch1/2_00 | Fine sand with occasional shell fragments | Annelida (Polychaeta), Arthropoda (Caridea), Chordata (Actinopterygii, Pleuronectiformes) | MJ, JH | 40 | 1782 | 1821 | |

# APPENDIX B FIELD SAMPLING LOGS

| SEABED IMAGERY LOG SHEET (Deck) | | | | | | | | | | | | | FOR-ENV-0538 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No: | 54463 | | Area: | North Sea | | | | Scale: Green Lasers Lines (99mm) | | | | | |
| Project: | Caledonia OWF Phase 2 | | | | | | | Equipment: 1Cam / OE14-208 / CT3022 | | | | | |
| Client: | Caledonia Offshore Windfarm Limited | | | | | | | Vessel: MV *Ocean Endeavour* | | | | | |
| Station Number | Date | Time on Overlay Start | Time on Overlay Finish | Duration | HD Video HDD File Name(s) | Topside SD Video File Name (s) | Sediment Description | Fauna Description | Operator(s) | No. of Photos | First Fix No. | Last Fix No. | Comments |
| ECR_ENV_32 | 06-Apr-2023 | 08:04:28 | 08:25:34 | 00:21:06 | 54463_ECR_ENV_32 00012.MTS | 54463_ECR_ENV_32_2023-04-06_080428_Ch1/2_00 | Fine sand with occasional shell fragments, cobbles and boulders | Arthropoda (Galatheoidea, Paguroidea), Chordata (Actinopterygii, Pleuronectiformes), Cnidaria (Actiniaria, Hydrozoa), Echinodermata (Asteroidea, Echinoidea, *Luidia* ) | MJ, JH | 52 | 1822 | 1873 | |
| ECR_ENV_11 | 06-Apr-2023 | 10:38:17 | 10:50:31 | 00:12:14 | 54463_ECR_ENV_11 00013.MTS | 54463_ECR_ENV_11_2023-04-06_103817_Ch1/2_00 | Fine sand with occasional shell fragments | Chordata (Actinopterygii, Pleuronectiformes), Cnidaria (*P. phosphorea* ), Echinodermata (Asteroidea, Echinoidea), Mollusca (Bivalvia) | RH, MC | 41 | 1874 | 1914 | |
| ECR_ENV_22 | 06-Apr-2023 | 12:23:27 | 12:34:48 | 00:11:21 | 54463_ECR_ENV_22 00014.MTS | 54463_ECR_ENV_22_2023-04-06_122327_Ch1/2_00 | Fine sand with occasional shell fragments | Chordata (Actinopterygii), Cnidaria (*P. phosphorea* ), Echinodermata (Asteroidea), Mollusca (Gastropoda) | RH, MC | 40 | 1915 | 1953 | |
| ECR_ENV_03 | 06-Apr-2023 | 14:37:19 | 14:48:20 | 00:11:01 | 54463_ECR_ENV_03 00015.MTS | 54463_ECR_ENV_03_2023-04-06_133719_Ch1/2_00 | Fine sand | Chordata (Actinopterygii), Cnidaria (*P. phosphorea* ) | RH, MC | 40 | 1955 | 1995 | |
| ECR_ENV_29 | 13-Apr-2023 | 17:58:44 | 18:12:24 | 00:13:40 | 54463_ECR_ENV_29 00000.MTS | 54463_ECR_ENV_29_2023-04-13_175844_Ch1/2_00 | Fine sand with faunal burrows | Arthropoda (Galatheoidea), Chordata (Actinopterygii, Pleuronectiformes), Cnidaria (*P. phosphorea* ) | RH, MC | 39 | 1996 | 2036 | Large swell |
| ECR_ENV_28 | 13-Apr-2023 | 21:38:19 | 21:51:03 | 00:12:44 | 54463_ECR_ENV_28 00001.MTS | 54463_ECR_ENV_28_2023-04-13_213819_Ch1/2_00 | Fine sand with faunal burrows | Arthropoda (Galatheoidea), Chordata (Actinopterygii, Pleuronectiformes), Cnidaria (Anthozoa, *P. phosphorea* , *Virgularia* ), Echinodermata (Asteroidea) | RH, MC | 40 | 2037 | 2077 | Large swell |
| ECR_ENV_10 | 13-Apr-2023 | 23:22:40 | 23:43:33 | 00:20:53 | 54463_ECR_ENV_10 00002.MTS | 54463_ECR_ENV_10_2023-04-13_232240_Ch1/2_00 | Fine sand with faunal burrows | Arthropoda (Galatheoidea), Chordata (Actinopterygii), Cnidaria (*P. phosphorea* ) | MJ, JH | 39 | 2085 | 2123 | Issue with EELs, no fix (2078-2084)<br>Repeated station due to issue with EELs and Voyager |
| ECR_ENV_10A | 14-Apr-2023 | 00:19:53 | 00:30:56 | 00:11:03 | 54463_ECR_ENV_10A 00003.MTS | 54463_ECR_ENV_10A_2023-04-14_001953_Ch1/2_00 | Fine sand with faunal burrows | Arthropoda (Galatheoidea), Chordata (Actinopterygii, Pleuronectiformes), Cnidaria (*P. phosphorea* ), Echinodermata (Asteroidea) | MJ, JH | 39 | 2124 | 2163 | Repeat of ECR_ENV_10 |
| ECR_ENV_31 | 14-Apr-2023 | 04:07:11 | 04:20:19 | 00:13:08 | 54463_ECR_ENV_31 00004.MTS | 54463_ECR_ENV_31_2023-04-14_040711_Ch1/2_00 | Fine sand with faunal burrows | Chordata (Actinopterygii, Pleuronectiformes), Cnidaria (*P. phosphorea* ), Echinodermata (Asteroidea) | MJ, JH | 40 | 2164 | 2203 | |

# APPENDIX B FIELD SAMPLING LOGS

| SEABED IMAGERY LOG SHEET (Deck) | | | | | | | | | | | | | FOR-ENV-0538 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No: | 54463 | | Area: | North Sea | | | Scale: Green Lasers Lines (99mm) | | | | | | |
| Project: | Caledonia OWF Phase 2 | | | | | | Equipment: 1Cam / OE14-208 / CT3022 | | | | | | |
| Client: | Caledonia Offshore Windfarm Limited | | | | | | Vessel: MV *Ocean Endeavour* | | | | | | |
| Station Number | Date | Time on Overlay Start | Time on Overlay Finish | Duration | HD Video HDD File Name(s) | Topside SD Video File Name (s) | Sediment Description | Fauna Description | Operator(s) | No. of Photos | First Fix No. | Last Fix No. | Comments |
| ECR_ENV_34 | 14-Apr-2023 | 06:43:37 | 06:58:33 | 00:14:56 | 54463_ECR_ENV_35 00005.MTS | 54463_ECR_ENV_34_2023-04-14_064337_Ch1/2_00 | Fine sand with faunal burrows | Chordata (Actinopterygii, Pleuronectiformes), Cnidaria (*P. phosphorea*) | MJ, JH | 45 | 2204 | 2248 | |
| ECR_ENV_30 | 14-Apr-2023 | 08:21:35 | 08:38:52 | 00:17:17 | 54463_ECR_ENV_30 00006.MTS | 54463_ECR_ENV_30_2023-04-14_082135_Ch1/2_00 | Fine sand with faunal burrows | Chordata (Actinopterygii, Pleuronectiformes), Cnidaria (Hydrozoa, *P. phosphorea*) | MJ, JH | 46 | 2249 | 2294 | |
| ECR_ENV_05 | 14-Apr-2023 | 10:12:09 | 10:22:23 | 00:10:14 | 54463_ECR_ENV_05 00007.MTS | 54463_ECR_ENV_05_2023-04-14_101209_Ch1/2_00 | Fine sand with faunal burrows | Chordata (Actinopterygii, Pleuronectiformes), Cnidaria (*P. phosphorea*) | MJ, JH | 36 | 2295 | 2332 | |
| ECR_ENV_36 | 14-Apr-2023 | 13:14:55 | 13:25:13 | 00:10:18 | 54463_ECR_ENV_36 00008.MTS | 54463_ECR_ENV_36_2023-04-14_131455_Ch1/2_00 | Fine sand with faunal burrows | Cnidaria (*P. phosphorea*) | RH, MC | 36 | 2333 | 2368 | |
| ECR_ENV_18 | 14-Apr-2023 | 15:03:59 | 15:21:53 | 00:17:54 | 54463_ECR_ENV_18 00009.MTS | 54463_ECR_ENV_18_2023-04-14_150359_Ch1/2_00 | Fine sand with faunal burrows | Chordata (Actinopterygii, Pleuronectiformes), Cnidaria (*P. phosphorea*), Mollusca (Gastropoda) | RH, MC | 43 | 2369 | 2412 | |
| ECR_ENV_61 | 19-May-2023 | 19:39:18 | 19:58:34 | 00:19:16 | 54463_ECR_ENV_61.MTS | 54463_ECR_ENV_61_2023-05-19_183919_Ch1/2_00 | Coarse sand with shells fragments, gravel. | Arthropoda (Galatheoidea, Paguroidae) Chordata (*Callionymus Lyra,* Pleuronectidae), Cnidaria (Plumulariidae), Mollusca (Buccinidae, Pectinidae) | JE | 30 | 4195 | 4225 | |
| ECR_ENV_62 | 19-May-2023 | 21:14:56 | 21:40:18 | 00:25:21 | 54463_ECR_ENV_62.MTS | 54463_ECR_ENV_62_2023-05-19_201457_Ch1/2_00 | Coarse sand with gravel pebbles and occasionally boulders. | Arthropoda (*Cancer pagurus*, Galatheoidea, Paguroidea), Bryozoa (Flustridae) Chordata (Actinopterygii, Gadidae, Pleuronectidae, Triglidae), Echinodermata (Asteroidea, *Astropecten irregularis*, *Asterias rubens*, *Porania pulvillus*), Mollusca (Buccinidae, Pectinidae, Solenidae) | JE | 50 | 4226 | 4276 | EELS log not populating all positional information. |
| ECR_ENV_60 | 19-May-2023 | 22:25:17 | 22:45:51 | 00:20:33 | 54463_ECR_ENV_60.MTS | 54463_ECR_ENV_60_2023-05-19_212518_Ch1/2_00 | Coarse sand with gravel pebbles and boulders. | Arthropoda (*Cancer pagurus*, Galatheoidea, Paguroidea), Chordata (Actinopterygii, Pleuronectidae,Triglidae), Cnidaria (*Alcyionium digitatum*, Plumulariidae, Sertulariidae), Echinodermata (*Asteria rubens*,*Crossaster pappo sus*, *Echinidae*) | JE | 61 | 4277 | 4338 | Issues with HD video recording. EELS log not populating all positional information. Debris: thick rope / wire debris in images 9699 and 9670. |

# APPENDIX B FIELD SAMPLING LOGS

| SEABED IMAGERY LOG SHEET (Deck) | | | | | | | | | | | | | FOR-ENV-0538 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No: | 54463 | | Area: | North Sea | | | | Scale: Green Lasers Lines (99mm) | | | | | |
| Project: | Caledonia OWF Phase 2 | | | | | | | Equipment: 1Cam / OE14-208 / CT3022 | | | | | |
| Client: | Caledonia Offshore Windfarm Limited | | | | | | | Vessel: MV *Ocean Endeavour* | | | | | |
| Station Number | Date | Time on Overlay Start | Time on Overlay Finish | Duration | HD Video HDD File Name(s) | Topside SD Video File Name (s) | Sediment Description | Fauna Description | Operator(s) | No. of Photos | First Fix No. | Last Fix No. | Comments |
| ECR_ENV_64 | 20-May-2023 | 02:42:23 | 03:28:33 | 00:22:11 | 54463_ECR_ENV_64-01/2/3/4.MTS | 54463_ECR_ENV_64_2023-05-20_014223_Ch1/2_00<br>54463_ECR_ENV_64_2023-05-20_014536_Ch1/2_00<br>54463_ECR_ENV_64_2023-05-20_020728_Ch1/2_00 | Coarse sand with gravel pebbles and boulders. Occasionally fine sand with sea pens and burrowing megafauna community | Arthropoda (*Cancer pagurus* , Galatheoidea, Paguroidae), Chordata (*Callionymus Lyra* , Gadidae, Pleuronectidae), Cnidaria (Actiniidae, Plumulariidae, *P. phosphorea,* Sertulariidae), Echinodermata (*Asterias rubens* , Luidia, Echinoidea, Ophiuroidea, *Porania pulvillus* ) | GB | 36 | 4339 | 4375 | Issues with EELS. Transect extended due to potential sea pen and burrowing megafauna habitat. |
| ECR_ENV_63 | 20-May-2023 | 04:19:01 | 04:37:07 | 00:18:09 | 54463_ECR_ENV_63-01/2.MTS | 54463_ECR_ENV_63_2023-05-20_031902_Ch1/2_00 | Coarse sand with gravel pebbles and boulders | Arthropoda (Galatheidae), Chordata (Gadidae), Cnidaria (Actiniidae, Plumulariidae, Sertulariidae), Echinodermata (*Asterias rubens* , Luidia, Echinoidea, *Porania pulvillus* ) | GB | 36 | 4376 | 4412 | EELS log not populating all positional information. |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | CoG | | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 | |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Grab Deployment Node | | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 29-Mar-2023 | 16:36 | 1 | ECR_ENV_08 | 20% | No Sample | HG | 74 | 526625 | 6398004 | 526624 | 6398007 | 1 | -3 | 3 | 165 | SG | Low retention |
| 29-Mar-2023 | 16:57 | 2 | ECR_ENV_08 | 30% | No Sample | HG | 74 | 526618 | 6398010 | 526624 | 6398007 | -6 | 3 | 7 | 295 | SG | Low retention |
| 29-Mar-2023 | 17:06 | 3 | ECR_ENV_08 | 30% | No Sample | HG | 74 | 526623 | 6398010 | 526624 | 6398007 | -2 | 3 | 3 | 330 | SG | Low retention |
| 29-Mar-2023 | 00:28 | 4 | ECR_ENV_08 | 20% | MFA | HG | 73 | 526635 | 6398008 | 526624 | 6398007 | 11 | 0 | 11 | 88 | PL | Moved 10m E, Low retention sample accepted |
| 29-Mar-2023 | 00:40 | 5 | ECR_ENV_08 | 20% | MFB | HG | 73 | 526633 | 6398002 | 526624 | 6398007 | 9 | -5 | 10 | 121 | PL | Low retention sample accepted |
| 29-Mar-2023 | 00:52 | 6 | ECR_ENV_08 | 20% | PSA | HG | 73 | 526633 | 6398007 | 526624 | 6398007 | 9 | 0 | 9 | 89 | PL | Low retention sample accepted |
| 30-Mar-2023 | 03:24 | 7 | ECR_ENV_15 | 70% | MFA | HG | 52 | 524540 | 6397552 | 524538 | 6397554 | 2 | -2 | 3 | 135 | PL | |
| 30-Mar-2023 | 03:42 | 8 | ECR_ENV_15 | 60% | MFB | HG | 52 | 524537 | 6397553 | 524538 | 6397554 | -1 | -1 | 1 | 242 | PL | |
| 30-Mar-2023 | 05:18 | 9 | ECR_ENV_20 | 20% | MFA | HG | 32 | 522010 | 6396359 | 522015 | 6396359 | -5 | 0 | 5 | 270 | PL | Low retention sample accepted |
| 30-Mar-2023 | 05:38 | 10 | ECR_ENV_20 | 20% | No Sample | HG | 32 | 522013 | 6396361 | 522015 | 6396359 | -2 | 2 | 3 | 304 | PL | Rock in jaws, wash out. |
| 30-Mar-2023 | 05:48 | 11 | ECR_ENV_20 | 20% | No Sample | HG | 32 | 522019 | 6396365 | 522015 | 6396359 | 3 | 6 | 7 | 31 | PL | Low retention |
| 30-Mar-2023 | 06:33 | 12 | ECR_ENV_20 | 20% | No Sample | HG | 32 | 521967 | 6396352 | 522015 | 6396359 | -48 | -7 | 49 | 262 | PL | Rock in jaws, wash out. |
| 30-Mar-2023 | 06:40 | 13 | ECR_ENV_20 | 20% | No Sample | HG | 32 | 521968 | 6396356 | 522015 | 6396359 | -47 | -3 | 48 | 266 | PL | Rock in jaws, wash out. |
| 30-Mar-2023 | 06:48 | 14 | ECR_ENV_20 | 10% | MFB | HG | 33 | 521963 | 6396359 | 522015 | 6396359 | -53 | 0 | 53 | 270 | PL | Moved 50m SW, Low retention sample accepted |
| 30-Mar-2023 | 08:24 | 15 | ECR_ENV_07 | 90% | MFA | HG | 32 | 523783 | 6395199 | 523782 | 6395200 | 1 | -1 | 1 | 124 | PL | |
| 30-Mar-2023 | 08:33 | 16 | ECR_ENV_07 | 80% | MFB | HG | 32 | 523782 | 6395200 | 523782 | 6395200 | 0 | 0 | 0 | 246 | PL | |
| 02-Apr-2023 | 14:10 | 17 | ECR_ENV_16 | 80% | MFA | HG | 40 | 525426 | 6395984 | 525425 | 6395985 | 2 | -2 | 2 | 136 | SG | |
| 02-Apr-2023 | 14:24 | 18 | ECR_ENV_16 | 70% | MFB | HG | 40 | 525422 | 6395982 | 525425 | 6395985 | -3 | -3 | 4 | 222 | SG | |
| 02-Apr-2023 | 16:17 | 19 | ECR_ENV_25 | 40% | MFA | HG | 75 | 528432 | 6398321 | 528441 | 6398316 | -9 | 6 | 10 | 303 | SG | |
| 02-Apr-2023 | 16:25 | 20 | ECR_ENV_25 | 30% | No Sample | HG | 75 | 528441 | 6398316 | 528441 | 6398316 | 0 | 0 | 0 | 38 | SG | Low retention |
| 02-Apr-2023 | 16:33 | 21 | ECR_ENV_25 | 40% | MFB | HG | 75 | 528435 | 6398316 | 528442 | 6398317 | -7 | -1 | 7 | 262 | SG | |
| 02-Apr-2023 | 18:07 | 22 | ECR_ENV_33 | 30% | No Sample | HG | 92 | 527778 | 6399736 | 527780 | 6399737 | -1 | -1 | 2 | 221 | SG | Low retention |
| 02-Apr-2023 | 18:40 | 23 | ECR_ENV_33 | 20% | No Sample | HG | 92 | 527779 | 6399734 | 527780 | 6399737 | -1 | -3 | 3 | 193 | SG | Low retention |
| 02-Apr-2023 | 18:58 | 24 | ECR_ENV_33 | 40% | MFA | HG | 92 | 527772 | 6399745 | 527780 | 6399737 | -8 | 8 | 11 | 318 | SG | |
| 02-Apr-2023 | 19:28 | 25 | ECR_ENV_33 | 40% | MFB | HG | 93 | 527780 | 6399742 | 527780 | 6399737 | 0 | 5 | 5 | 360 | SG | |
| 03-Apr-2023 | 05:12 | 26 | ECR_ENV_17 | 60% | MFA | HG | 75 | 525687 | 6399992 | 525686 | 6399992 | 2 | 0 | 2 | 84 | PL | |
| 03-Apr-2023 | 05:31 | 27 | ECR_ENV_17 | 50% | MFB | HG | 75 | 525685 | 6399989 | 525686 | 6399992 | 0 | -3 | 3 | 189 | PL | |
| 03-Apr-2023 | 06:08 | 28 | ECR_ENV_17 | 40% | CHEM | DG | 76 | 525686 | 6399992 | 525686 | 6399992 | 1 | 0 | 1 | 85 | PL | |
| 03-Apr-2023 | 15:48 | 29 | ECR_ENV_26 | 90% | MFA | HG | 110 | 528614 | 6402534 | 528618 | 6402532 | -4 | 3 | 5 | 307 | SG | |
| 03-Apr-2023 | 15:59 | 30 | ECR_ENV_26 | 90% | MFB | HG | 109 | 528617 | 6402536 | 528618 | 6402532 | -1 | 4 | 4 | 352 | SG | |
| 03-Apr-2023 | 16:25 | 31 | ECR_ENV_26 | 90% | CHEM | DG | 109 | 528614 | 6402536 | 528618 | 6402532 | -4 | 5 | 6 | 319 | SG | |
| 04-Apr-2023 | 05:15 | 32 | ECR_ENV_21 | 60% | MFA | HG | 48 | 528144 | 6396764 | 528145 | 6396764 | -1 | 0 | 1 | 288 | PL | |
| 04-Apr-2023 | 05:28 | 33 | ECR_ENV_21 | 30% | No Sample | HG | 48 | 528144 | 6396768 | 528145 | 6396764 | -1 | 4 | 4 | 351 | PL | Rock in jaws, wash out |
| 04-Apr-2023 | 05:37 | 34 | ECR_ENV_21 | 50% | MFB | HG | 48 | 528145 | 6396764 | 528145 | 6396764 | 1 | 0 | 1 | 76 | PL | |

# APPENDIX B FIELD SAMPLING LOGS

## Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | | Vessel | MV *Ocean Endeavour* | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | | Vessel Reference Point (VRP) | CoG | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | | Actual Coordinates derived from | Grab Deployment Node | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | | Projection | UTM zone 30N | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 04-Apr-2023 | 09:11 | 35 | ECR_ENV_53 | 70% | MFA | HG | 31 | 525615 | 6394768 | 525615 | 6394765 | 0 | 3 | 3 | 358 | PL | |
| 04-Apr-2023 | 09:24 | 36 | ECR_ENV_53 | 70% | MFB | HG | 31 | 525616 | 6394764 | 525615 | 6394765 | 0 | -1 | 1 | 148 | PL | |
| 04-Apr-2023 | 09:48 | 37 | ECR_ENV_53 | 60% | CHEM | DG | 31 | 525615 | 6394768 | 525615 | 6394765 | 0 | 3 | 3 | 0 | PL | |
| 04-Apr-2023 | 11:32 | 38 | ECR_ENV_01 | 50% | MFA | HG | 35 | 527942 | 6394892 | 527943 | 6394888 | -1 | 3 | 3 | 349 | SG | |
| 04-Apr-2023 | 11:37 | 39 | ECR_ENV_01 | 0% | No Sample | HG | 35 | 527945 | 6394887 | 527943 | 6394888 | 2 | -1 | 2 | 121 | SG | Rock in jaws, wash out |
| 04-Apr-2023 | 11:41 | 40 | ECR_ENV_01 | 0% | No Sample | HG | 35 | 527946 | 6394887 | 527943 | 6394888 | 4 | -1 | 4 | 112 | SG | Rock in jaws, wash out |
| 04-Apr-2023 | 11:46 | 41 | ECR_ENV_01 | 0% | No Sample | HG | 35 | 527945 | 6394888 | 527943 | 6394888 | 2 | 0 | 2 | 102 | SG | Rock in jaws, wash out |
| 04-Apr-2023 | 11:52 | 42 | ECR_ENV_01 | 50% | MFB | HG | 35 | 527935 | 6394889 | 527943 | 6394888 | -7 | 0 | 7 | 272 | SG | Moved 10m W |
| 04-Apr-2023 | 17:22 | 43 | ECR_ENV_02 | 90% | MFA | HG | 88 | 524999 | 6404670 | 525003 | 6404670 | -3 | -1 | 3 | 258 | SG | |
| 04-Apr-2023 | 17:33 | 44 | ECR_ENV_02 | 90% | MFB | HG | 88 | 525001 | 6404672 | 525003 | 6404670 | -2 | 1 | 2 | 312 | SG | |
| 05-Apr-2023 | 00:58 | 45 | ECR_ENV_14 | 0% | No Sample | HG | 70 | 528137 | 6404767 | 528139 | 6404768 | -2 | -2 | 3 | 229 | PL | Rock in jaws, wash out |
| 05-Apr-2023 | 01:03 | 46 | ECR_ENV_14 | 0% | No Sample | HG | 70 | 528139 | 6404767 | 528139 | 6404768 | 1 | -1 | 1 | 151 | PL | Rock in jaws, wash out |
| 05-Apr-2023 | 01:13 | 47 | ECR_ENV_14 | 0% | No Sample | HG | 70 | 528147 | 6404762 | 528139 | 6404768 | 8 | -7 | 10 | 131 | PL | Rock in jaws, wash out |
| 05-Apr-2023 | 01:25 | 48 | ECR_ENV_14 | 40% | MFA | HG | 69 | 528122 | 6404750 | 528139 | 6404768 | -16 | -18 | 25 | 221 | PL | |
| 05-Apr-2023 | 01:35 | 49 | ECR_ENV_14 | 0% | No Sample | HG | 70 | 528123 | 6404751 | 528139 | 6404768 | -16 | -18 | 24 | 221 | PL | Rock in jaws, wash out |
| 05-Apr-2023 | 01:45 | 50 | ECR_ENV_14 | 50% | MFB | HG | 69 | 528126 | 6404751 | 528139 | 6404768 | -12 | -18 | 22 | 215 | PL | |
| 05-Apr-2023 | 03:28 | 51 | ECR_ENV_35 | 70% | MFA | HG | 78 | 528928 | 6405415 | 528927 | 6405414 | 1 | 2 | 2 | 34 | PL | |
| 05-Apr-2023 | 03:39 | 52 | ECR_ENV_35 | 70% | MFB | HG | 78 | 528928 | 6405412 | 528927 | 6405414 | 1 | -2 | 2 | 147 | PL | |
| 05-Apr-2023 | 05:43 | 53 | ECR_ENV_12 | 90% | MFA | HG | 90 | 527240 | 6406198 | 527238 | 6406199 | 2 | 0 | 2 | 92 | PL | |
| 05-Apr-2023 | 06:00 | 54 | ECR_ENV_12 | 90% | MFB | HG | 90 | 527239 | 6406197 | 527238 | 6406199 | 1 | -1 | 2 | 137 | PL | |
| 05-Apr-2023 | 14:04 | 55 | ECR_ENV_24 | 90% | MFA | HG | 92 | 526033 | 6407680 | 526032 | 6407680 | 2 | 0 | 2 | 76 | SG | |
| 05-Apr-2023 | 14:12 | 56 | ECR_ENV_24 | 90% | MFB | HG | 92 | 526033 | 6407681 | 526032 | 6407680 | 2 | 1 | 2 | 69 | SG | |
| 05-Apr-2023 | 16:29 | 57 | ECR_ENV_09 | 90% | MFA | HG | 87 | 524419 | 6407869 | 524422 | 6407875 | -3 | -6 | 7 | 206 | SG | |
| 05-Apr-2023 | 16:37 | 58 | ECR_ENV_09 | 90% | MFB | HG | 87 | 524422 | 6407869 | 524422 | 6407875 | 0 | -6 | 6 | 182 | SG | |
| 05-Apr-2023 | 18:17 | 59 | ECR_ENV_27 | 90% | MFA | HG | 90 | 527954 | 6408299 | 527955 | 6408300 | -1 | -1 | 2 | 230 | SG | |
| 05-Apr-2023 | 18:28 | 60 | ECR_ENV_27 | 90% | MFB | HG | 89 | 527953 | 6408301 | 527955 | 6408300 | -2 | 1 | 3 | 291 | SG | |
| 05-Apr-2023 | 21:30 | 61 | ECR_ENV_04 | 90% | MFA | HG | 83 | 526525 | 6410862 | 526524 | 6410862 | 1 | -1 | 1 | 124 | SG | |
| 05-Apr-2023 | 21:41 | 62 | ECR_ENV_04 | 90% | MFB | HG | 84 | 526524 | 6410862 | 526524 | 6410862 | 0 | -1 | 1 | 155 | SG | |
| 05-Apr-2023 | 21;58 | 63 | ECR_ENV_04 | 80% | CHEM | DG | 84 | 526524 | 6410862 | 526524 | 6410862 | 0 | -1 | 1 | 173 | SG | |
| 06-Apr-2023 | 23:33 | 64 | ECR_ENV_19 | 60% | MFA | HG | 79 | 526291 | 6412284 | 526293 | 6412287 | -3 | -3 | 4 | 223 | PL | |
| 06-Apr-2023 | 23:44 | 65 | ECR_ENV_19 | 70% | MFB | HG | 79 | 526291 | 6412284 | 526293 | 6412287 | -2 | -3 | 3 | 214 | PL | |
| 06-Apr-2023 | 01:21 | 66 | ECR_ENV_23 | 60% | MFA | HG | 74 | 526709 | 6414360 | 526710 | 6414359 | -1 | 1 | 2 | 303 | PL | |
| 06-Apr-2023 | 01:32 | 67 | ECR_ENV_23 | 50% | MFB | HG | 74 | 526713 | 6414358 | 526710 | 6414359 | 3 | -1 | 3 | 107 | PL | |
| 06-Apr-2023 | 03:22 | 68 | ECR_ENV_06 | 50% | MFA | HG | 71 | 527937 | 6415793 | 527936 | 6415791 | 1 | 2 | 2 | 25 | PL | |
| 06-Apr-2023 | 03:33 | 69 | ECR_ENV_06 | 40% | MFB | HG | 71 | 527935 | 6415793 | 527936 | 6415791 | -2 | 1 | 2 | 312 | PL | |
| 06-Apr-2023 | 07:05 | 70 | ECR_ENV_13 | 50% | MFA | HG | 63 | 525887 | 6415998 | 525888 | 6415996 | -1 | 1 | 2 | 324 | PL | |
| 06-Apr-2023 | 07:19 | 71 | ECR_ENV_13 | 50% | MFB | HG | 63 | 525889 | 6415995 | 525888 | 6415996 | 0 | -1 | 1 | 166 | PL | |
| 06-Apr-2023 | 07:45 | 72 | ECR_ENV_13 | 60% | CHEM | DG | 63 | 525889 | 6415995 | 525888 | 6415996 | 1 | -1 | 2 | 140 | PL | |

# APPENDIX B FIELD SAMPLING LOGS

Gardline — Seafloor Sampling Positioning Summary

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | CoG | | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 | |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Grab Deployment Node | | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Time (UTC) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 06-Apr-2023 | 09:44 | 73 | ECR_ENV_32 | 1% | No Sample | HG | 62 | 525128 | 6418432 | 525129 | 6418432 | -1 | -1 | 1 | 223 | PL | Rock in jaws, wash out |
| 06-Apr-2023 | 09:53 | 74 | ECR_ENV_32 | 5% | No Sample | HG | 62 | 525128 | 6418431 | 525129 | 6418432 | -1 | -2 | 2 | 211 | PL | Rock in jaws, wash out |
| 06-Apr-2023 | 10:02 | 75 | ECR_ENV_32 | 2% | No Sample | HG | 62 | 525127 | 6418432 | 525129 | 6418432 | -1 | -1 | 2 | 251 | PL | Rock in jaws, wash out |
| 06-Apr-2023 | 10:17 | 76 | ECR_ENV_32 | 0% | No Sample | HG | 62 | 525136 | 6418426 | 525129 | 6418432 | 7 | -6 | 10 | 132 | PL | Rock in jaws, wash out |
| 06-Apr-2023 | 10:27 | 77 | ECR_ENV_32 | 0% | No Sample | HG | 62 | 525134 | 6418424 | 525129 | 6418432 | 6 | -8 | 10 | 145 | PL | Rock in jaws, wash out |
| 06-Apr-2023 | 10:39 | 78 | ECR_ENV_32 | 2% | No Sample | HG | 62 | 525136 | 6418426 | 525129 | 6418432 | 7 | -7 | 10 | 132 | PL | Rock in jaws, wash out, Station abandoned |
| 06-Apr-2023 | 12:03 | 79 | ECR_ENV_11 | 0% | No Sample | HG | 68 | 527404 | 6419347 | 527403 | 6419346 | 1 | 1 | 1 | 56 | SG | Rock in jaws, wash out |
| 06-Apr-2023 | 12:09 | 80 | ECR_ENV_11 | 40% | MFA | HG | 68 | 527403 | 6419347 | 527403 | 6419346 | 0 | 1 | 1 | 358 | SG | |
| 06-Apr-2023 | 12:15 | 81 | ECR_ENV_11 | 0% | No Sample | HG | 68 | 527402 | 6419347 | 527403 | 6419346 | -1 | 1 | 1 | 319 | SG | Rock in jaws, wash out |
| 06-Apr-2023 | 12:22 | 82 | ECR_ENV_11 | 0% | No Sample | HG | 68 | 527403 | 6419351 | 527403 | 6419346 | 1 | 5 | 5 | 6 | SG | Rock in jaws, wash out |
| 06-Apr-2023 | 12:31 | 83 | ECR_ENV_11 | 0% | No Sample | HG | 68 | 527396 | 6419339 | 527403 | 6419346 | -7 | -7 | 10 | 225 | SG | Moved 10m SW, Rock in jaws, wash out |
| 06-Apr-2023 | 12:37 | 84 | ECR_ENV_11 | 40% | MFB | HG | 68 | 527396 | 6419340 | 527403 | 6419346 | -6 | -6 | 9 | 225 | SG | |
| 06-Apr-2023 | 13:47 | 85 | ECR_ENV_22 | 40% | MFA | HG | 64 | 526411 | 6421397 | 526407 | 6421398 | 4 | -1 | 4 | 101 | SG | |
| 06-Apr-2023 | 13:54 | 86 | ECR_ENV_22 | 40% | MFB | HG | 64 | 526407 | 6421397 | 526407 | 6421398 | 0 | -1 | 1 | 169 | SG | |
| 06-Apr-2023 | 15:00 | 87 | ECR_ENV_03 | 40% | MFA | HG | 74 | 527817 | 6422338 | 527815 | 6422341 | 1 | -3 | 3 | 152 | SG | |
| 06-Apr-2023 | 15:06 | 88 | ECR_ENV_03 | 30% | No sample | HG | 74 | 527819 | 6422338 | 527815 | 6422341 | 4 | -3 | 5 | 122 | SG | Low retention |
| 06-Apr-2023 | 15:13 | 89 | ECR_ENV_03 | 50% | MFB | HG | 74 | 527818 | 6422343 | 527815 | 6422341 | 3 | 2 | 4 | 51 | SG | |
| 13-Apr-2023 | 21:29 | 90 | ECR_ENV_29 | 90% | MFA | HG | 83 | 526547 | 6423621 | 526548 | 6423621 | -1 | 0 | 1 | 257 | SG | |
| 13-Apr-2023 | 21:38 | 91 | ECR_ENV_29 | 90% | MFB | HG | 83 | 526547 | 6423623 | 526548 | 6423621 | -1 | 2 | 2 | 332 | SG | |
| 13-Apr-2023 | 21:53 | 92 | ECR_ENV_29 | 90% | CHEM | DG | 83 | 526546 | 6423622 | 526548 | 6423621 | -2 | 1 | 2 | 301 | SG | |
| 14-Apr-2023 | 23:08 | 93 | ECR_ENV_28 | 80% | MFA | HG | 78 | 527325 | 6425046 | 527328 | 6425044 | -3 | 2 | 3 | 307 | PL | |
| 14-Apr-2023 | 23:20 | 94 | ECR_ENV_28 | 90% | MFB | HG | 78 | 527332 | 6425046 | 527328 | 6425044 | 5 | 2 | 5 | 67 | PL | |
| 14-Apr-2023 | 01:53 | 95 | ECR_ENV_10 | 80% | MFA | HG | 78 | 526898 | 6427552 | 526894 | 6427550 | 3 | 2 | 4 | 54 | PL | |
| 14-Apr-2023 | 02:06 | 96 | ECR_ENV_10 | 80% | MFB | HG | 78 | 526896 | 6427550 | 526894 | 6427550 | 2 | 0 | 2 | 87 | PL | |
| 14-Apr-2023 | 05:44 | 97 | ECR_ENV_31 | | No sample | HG | 76 | 529147 | 6429218 | 529151 | 6429215 | -4 | 2 | 4 | 303 | PL | Contaminated, did not clean with bleach |
| 14-Apr-2023 | 05:52 | 98 | ECR_ENV_31 | 80% | MFA | HG | 76 | 529151 | 6429213 | 529151 | 6429215 | 0 | -2 | 2 | 174 | PL | |
| 14-Apr-2023 | 06:06 | 99 | ECR_ENV_31 | 80% | MFB | HG | 76 | 529150 | 6429215 | 529151 | 6429215 | 0 | -1 | 1 | 206 | PL | |
| 14-Apr-2023 | 06:32 | 100 | ECR_ENV_31 | 70% | CHEM | DG | 76 | 529150 | 6429217 | 529151 | 6429215 | -1 | 2 | 2 | 325 | PL | |
| 14-Apr-2023 | 08:16 | 101 | ECR_ENV_34 | 60% | MFA | HG | 76 | 526389 | 6430516 | 526390 | 6430516 | -1 | 0 | 1 | 247 | PL | |
| 14-Apr-2023 | 08:24 | 102 | ECR_ENV_34 | 70% | MFB | HG | 76 | 526390 | 6430516 | 526390 | 6430516 | 0 | 0 | 0 | 244 | PL | |
| 14-Apr-2023 | 09:58 | 103 | ECR_ENV_30 | 20% | No sample | HG | 74 | 527788 | 6431899 | 527788 | 6431898 | 0 | 1 | 1 | 344 | PL | Low retention |
| 14-Apr-2023 | 10:10 | 104 | ECR_ENV_30 | 50% | MFA | HG | 74 | 527787 | 6431898 | 527788 | 6431898 | -1 | 0 | 1 | 284 | PL | |
| 14-Apr-2023 | 10:21 | 105 | ECR_ENV_30 | 70% | MFB | HG | 73 | 527788 | 6431898 | 527788 | 6431898 | 0 | 0 | 0 | 109 | PL | |
| 14-Apr-2023 | 11:33 | 106 | ECR_ENV_05 | 40% | MFA | HG | 75 | 529730 | 6431937 | 529726 | 6431936 | 3 | 1 | 4 | 72 | SG | |
| 14-Apr-2023 | 11:41 | 107 | ECR_ENV_05 | 30% | No sample | HG | 75 | 529726 | 6431931 | 529726 | 6431936 | -1 | -5 | 5 | 189 | SG | Low retention |
| 14-Apr-2023 | 11:48 | 108 | ECR_ENV_05 | 40% | MFB | HG | 75 | 529726 | 6431936 | 529726 | 6431936 | -1 | -1 | 1 | 220 | SG | |
| 14-Apr-2023 | 14:37 | 109 | ECR_ENV_36 | 40% | MFA | HG | 73 | 527612 | 6435817 | 527614 | 6435820 | -2 | -3 | 4 | 211 | SG | |
| 14-Apr-2023 | 14:47 | 110 | ECR_ENV_36 | 40% | MFB | HG | 73 | 527617 | 6435819 | 527614 | 6435820 | 3 | -1 | 3 | 110 | SG | |
| 14-Apr-2023 | 15:02 | 111 | ECR_ENV_36 | 10% | No sample | HG | 73 | 527612 | 6435819 | 527614 | 6435820 | -2 | -1 | 2 | 244 | SG | Low retention |

# APPENDIX B FIELD SAMPLING LOGS

## Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | CoG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | Camera Deployment Node | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Grab Deployment Node | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | | Vertical / Tidal Datum | VORF, LAT | |

| Date | Time (UTC) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 14-Apr-2023 | 15:10 | 112 | ECR_ENV_36 | 60% | CHEM | DG | 73 | 527611 | 6435818 | 527614 | 6435820 | -3 | -2 | 3 | 237 | SG | |
| 14-Apr-2023 | 16:58 | 113 | ECR_ENV_18 | 60% | MFA | HG | 69 | 529459 | 6435227 | 529459 | 6435225 | 0 | 2 | 2 | 360 | SG | |
| 14-Apr-2023 | 17:06 | 114 | ECR_ENV_18 | 90% | MFB | HG | 69 | 529458 | 6435225 | 529459 | 6435225 | -2 | 0 | 2 | 262 | SG | |

# APPENDIX B FIELD SAMPLING LOGS

| SEABED SAMPLING LOG SHEET (Deck) | | | | | | | | | | FOR-ENV-0539 |
|---|---|---|---|---|---|---|---|---|---|---|
| Job No: | 54463 | | | Area: | North Sea | | | Sieve Size: 1mm | | |
| Project: | Caledonia OWF Phase 2 | | | | | | | Equipment: Mini-Hamon Grab, Day Grab | | |
| Client: | Caledonia Offshore Windfarm Limited | | | | | | | Vessel: MV *Ocean Endeavour* | | |
| Sample Number | Station Number | Date | Time | Penetration | Sample Retention | Sample Receptacle | Sediment Description | Fauna Description | Operator(s) | Comments |
| 1 | ECR_ENV_08 | 29-Mar-2023 | 16:36 | 20% | No sample | | | | RH, MC | Low retention |
| 2 | ECR_ENV_08 | 29-Mar-2023 | 16:57 | 30% | No sample | | | | RH, MC | Low retention |
| 3 | ECR_ENV_08 | 29-Mar-2023 | 17:06 | 30% | No sample | | | | RH, MC | Low retention |
| 4 | ECR_ENV_08 | 30-Mar-2023 | 00:28 | 20% | MFA | 1 x 1L | Fine sand with shell fragments<br>Munsell: 5Y 4/2 | Annelida (Polychaeta) | MJ, JAH | Moved 10m E, Low retention sample accepted |
| 5 | ECR_ENV_08 | 30-Mar-2023 | 00:40 | 20% | MFB | 1 x 1L | Fine sand with shell fragments<br>Munsell: 5Y 4/2 | Annelida (Polychaeta) | MJ, JAH | Low retention sample accepted |
| 6 | ECR_ENV_08 | 30-Mar-2023 | 00:52 | 20% | PSA | 2 x ziplock bag | Fine sand with shell fragments<br>Munsell: 5Y 4/2 | No visible fauna | MJ, JAH | PSA and PSA Spare |
| 7 | ECR_ENV_15 | 30-Mar-2023 | 03:24 | 70% | MFA | 1 x 5L<br>1 x ziplock bag | Coarse sand and shell fragments<br>Munsell: 5Y 5/3 | No visible fauna | MJ, JAH | PSA |
| 8 | ECR_ENV_15 | 30-Mar-2023 | 03:42 | 60% | MFB | 1 x 5L<br>1 x ziplock bag | Coarse sand and shell fragments<br>Munsell: 5Y 5/3 | No visible fauna | MJ, JAH | PSA Spare |
| 9 | ECR_ENV_20 | 30-Mar-2023 | 05:18 | 20% | MFA | 1 x 1L | Coarse sand with gravel, cobbles and shell fragments<br>Munsell: 5Y 5/3<br>Cobbles: 80% | Echinodermata (*Asterias rubens* ), Mollusca (Bivalvia) | MJ, JAH | Low retention sample accepted, no PSA |
| 10 | ECR_ENV_20 | 30-Mar-2023 | 05:38 | 20% | No sample | | | | MJ, JAH | Rock in grab jaws |
| 11 | ECR_ENV_20 | 30-Mar-2023 | 05:48 | 20% | No sample | | | | MJ, JAH | Low retention |
| 12 | ECR_ENV_20 | 30-Mar-2023 | 06:33 | 20% | No sample | | | | MJ, JAH | Rock in grab jaws |
| 13 | ECR_ENV_20 | 30-Mar-2023 | 06:40 | 20% | No sample | | | | MJ, JAH | Rock in grab jaws |
| 14 | ECR_ENV_20 | 30-Mar-2023 | 06:48 | 10% | MFB | 1 x 1L | Coarse sand with gravel, cobbles and shell fragments<br>Munsell: 5Y 5/3<br>Cobbles: 30% | Annelida (Polychaeta), Arthropoda (Paguroidea) | MJ, JAH | Moved 50m SW, Low retention sample accepted, no PSA Spare |
| 15 | ECR_ENV_07 | 30-Mar-2023 | 08:24 | 90% | MFA | 1 x 5L<br>1 x ziplock bag | Coarse sand with shell fragments<br>Munsell: 10YR 6/6 | No visible fauna | MJ, JAH | PSA |
| 16 | ECR_ENV_07 | 30-Mar-2023 | 08:33 | 80% | MFB | 1 x 5L<br>1 x ziplock bag | Coarse sand with shell fragments<br>Munsell: 10YR 6/6 | Annelida (Polychaeta), Echinodermata (Echinoidea) | MJ, JAH | PSA Spare |
| 17 | ECR_ENV_16 | 02-Apr-2023 | 14:10 | 80% | MFA | 1 x 5L<br>1 x ziplock bag | Coarse sand with shell fragments<br>Munsell: 10YR 3/3 | Annelida (Polychaeta), Mollusca (Bivalvia) | RH, MC | PSA |
| 18 | ECR_ENV_16 | 02-Apr-2023 | 14:24 | 70% | MFB | 1 x 5L<br>1 x ziplock bag | Coarse sand with shell fragments<br>Munsell: 10YR 3/3 | Annelida (Polychaeta), Mollusca (Bivalvia) | RH, MC | PSA Spare |
| 19 | ECR_ENV_25 | 02-Apr-2023 | 16:17 | 40% | MFA | 1 x 1L<br>1 x ziplock bag | Fine sand with shell fragments<br>Munsell: 10Y 4/2 | Annelida (Polychaeta), Echinodermata (Echinoidea) | RH, MC | PSA |
| 20 | ECR_ENV_25 | 02-Apr-2023 | 16:25 | 20% | No sample | | | | RH, MC | Low retention |

# APPENDIX B FIELD SAMPLING LOGS

| SEABED SAMPLING LOG SHEET (Deck) | | | | | | | | | | FOR-ENV-0539 |
|---|---|---|---|---|---|---|---|---|---|---|
| Job No: 54463 | | | | Area: North Sea | | | | Sieve Size: 1mm | | |
| Project: Caledonia OWF Phase 2 | | | | | | | | Equipment: Mini-Hamon Grab, Day Grab | | |
| Client: Caledonia Offshore Windfarm Limited | | | | | | | | Vessel: MV *Ocean Endeavour* | | |
| Sample Number | Station Number | Date | Time | Penetration | Sample Retention | Sample Receptacle | Sediment Description | Fauna Description | Operator(s) | Comments |
| 21 | ECR_ENV_25 | 02-Apr-2023 | 16:33 | 40% | MFB | 1 x 1L<br>1 x ziplock bag | Fine sand with shell fragments<br>Munsell: 10YR 4/2 | Annelida (Polychaeta), Echinodermata (Echinoidea) | RH, MC | PSA Spare |
| 22 | ECR_ENV_33 | 02-Apr-2023 | 18:07 | 30% | No sample | | | | RH, MC | Low retention |
| 23 | ECR_ENV_33 | 02-Apr-2023 | 18:40 | 20% | No sample | | | | RH, MC | Low retention |
| 24 | ECR_ENV_33 | 02-Apr-2023 | 18:58 | 40% | MFA | 1 x 1L<br>1 x ziplock bag | Fine sand with shell fragments<br>Munsell: 10YR 4/2 | Annelida (Polychaeta), Echinodermata (Echinoidea) | RH, MC | PSA |
| 25 | ECR_ENV_33 | 02-Apr-2023 | 19:28 | 40% | MFB | 1 x 1L<br>1 x ziplock bag | Fine sand with shell fragments<br>Munsell: 10YR 4/2 | Annelida (Polychaeta) | RH, MC | PSA Spare |
| 26 | ECR_ENV_17 | 03-Apr-2023 | 05:12 | 60% | MFA | 1 x 1L<br>2 x ziplock bag | Fine sand with shell fragments<br>Munsell: 5Y 4/3 | Echinodermata (Echinoidea), Mollusca (Bivalvia, Scaphopoda) | MJ, JAH | PSA<br>eDNA |
| 27 | ECR_ENV_17 | 03-Apr-2023 | 05:31 | 50% | MFB | 1 x 1L<br>2 x ziplock bag | Fine sand with shell fragments<br>Munsell: 5Y 4/3 | Annelida (Polychaeta) | MJ, JAH | PSA Spare<br>eDNA Spare |
| 28 | ECR_ENV_17 | 03-Apr-2023 | 06:08 | 40% | CHEM | 2 x 1L Jar | Fine sand with shell fragments<br>Munsell: 5Y 4/3 | No visible fauna | MJ, JAH | CHEM and CHEM Spare |
| 29 | ECR_ENV_26 | 03-Apr-2023 | 15:48 | 90% | MFA | 1 x 1L<br>2 x ziplock bag | Fine sand<br>Munsell: 10YR 2/3 | Annelida (Polychaeta), Echinodermata (Echinoidea) | RH, MC | PSA<br>eDNA |
| 30 | ECR_ENV_26 | 03-Apr-2023 | 15:59 | 90% | MFB | 1 x 1L<br>2 x ziplock bag | Fine sand<br>Munsell: 10YR 2/3 | Annelida (Polychaeta), Echinodermata (Echinoidea, Ophiuroidea) | RH, MC | PSA Spare<br>eDNA Spare |
| 31 | ECR_ENV_26 | 03-Apr-2023 | 16:25 | 90% | CHEM | 2 x 1L Jar | Fine sand<br>Munsell: 10YR 2/3 | No visible fauna | RH, MC | CHEM and CHEM Spare |
| 32 | ECR_ENV_21 | 04-Apr-2023 | 05:15 | 60% | MFA | 1 x 5L<br>1 x ziplock bag | Fine sand with gravel, cobbles and shell fragments<br>Munsell: 5Y 4/4<br>Cobbles: 5% | Annelida (Polychaeta) | MJ, JAH | PSA |
| 33 | ECR_ENV_21 | 04-Apr-2023 | 05:28 | 30% | No sample | | | | MJ, JAH | Rock in grab jaws |
| 34 | ECR_ENV_21 | 04-Apr-2023 | 05:37 | 50% | MFB | 1 x 5L<br>1 x ziplock bag | Fine sand with cobbles and shell fragments<br>Munsell: 5Y 4/4 | No visible fauna | MJ, JAH | PSA Spare |
| 35 | ECR_ENV_53 | 04-Apr-2023 | 09:11 | 70% | MFA | 1 x 1L<br>2 x ziplock bag | Medium sand with shell fragments<br>Munsell: 10YR 4/6 | Echinodermata (Ophiuroidea), Mollusca (Bivalvia) | RH, MC | PSA<br>eDNA |
| 36 | ECR_ENV_53 | 04-Apr-2023 | 09:24 | 70% | MFB | 1 x 1L<br>2 x ziplock bag | Medium sand with shell fragments<br>Munsell: 10YR 4/6 | Annelida (Polychaeta) | RH, MC | PSA Spare<br>eDNA Spare |
| 37 | ECR_ENV_53 | 04-Apr-2023 | 09:48 | 60% | CHEM | 2 x 1L Jar | Medium sand with shell fragments<br>Munsell: 10YR 4/6 | No visible fauna | RH, MC | CHEM and CHEM Spare |

# APPENDIX B FIELD SAMPLING LOGS

| SEABED SAMPLING LOG SHEET (Deck) | | | | | | | | | | FOR-ENV-0539 |
|---|---|---|---|---|---|---|---|---|---|---|
| Job No: 54463 | | | Area: North Sea | | | | | Sieve Size: 1mm | | |
| Project: Caledonia OWF Phase 2 | | | | | | | | Equipment: Mini-Hamon Grab, Day Grab | | |
| Client: Caledonia Offshore Windfarm Limited | | | | | | | | Vessel: MV *Ocean Endeavour* | | |
| Sample Number | Station Number | Date | Time | Penetration | Sample Retention | Sample Receptacle | Sediment Description | Fauna Description | Operator(s) | Comments |
| 38 | ECR_ENV_01 | 04-Apr-2023 | 11:32 | 50% | MFA | 1 x 5L<br>1 x ziplock bag | Coarse sand with gravel, cobble and shell fragments<br>Munsell: 10YR 3/3<br>Cobble: 5% | Annelida (Polychaeta), Mollusca (Bivalvia) | RH, MC | PSA |
| 39 | ECR_ENV_01 | 04-Apr-2023 | 11:37 | 0% | No sample | | | | RH, MC | Rock in grab jaws |
| 40 | ECR_ENV_01 | 04-Apr-2023 | 11:41 | 0% | No sample | | | | RH, MC | Grab empty, Misfire |
| 41 | ECR_ENV_01 | 04-Apr-2023 | 11:46 | 0% | No sample | | | | RH, MC | Rock in grab jaws |
| 42 | ECR_ENV_01 | 04-Apr-2023 | 11:52 | 50% | MFB | 1 x 5L<br>1 x ziplock bag | Coarse sand with gravel, cobble and shell fragments<br>Munsell: 10YR 3/3<br>Cobble: 20% | Annelida (Polychaeta) | RH, MC | PSA Spare |
| 43 | ECR_ENV_02 | 04-Apr-2023 | 17:22 | 90% | MFA | 1 x 1L<br>1 x ziplock bag | Fine sand with shell fragments<br>Munsell: 10YR 2/4 | Annelida (Polychaeta) | RH, MC | PSA |
| 44 | ECR_ENV_02 | 04-Apr-2023 | 17:33 | 90% | MFB | 1 x 1L<br>1 x ziplock bag | Fine sand with shell fragments<br>Munsell: 10YR 2/4 | Annelida (Polychaeta), Echinodermata (Echinoidea, Ophiuroidea) | RH, MC | PSA Spare |
| 45 | ECR_ENV_14 | 05-Apr-2023 | 00:58 | 0% | No sample | | | | MJ, JAH | Rock in grab jaws |
| 46 | ECR_ENV_14 | 05-Apr-2023 | 01:03 | 0% | No sample | | | | MJ, JAH | Rock in grab jaws |
| 47 | ECR_ENV_14 | 05-Apr-2023 | 01:13 | 0% | No sample | | | | MJ, JAH | Rock in grab jaws |
| 48 | ECR_ENV_14 | 05-Apr-2023 | 01:25 | 40% | MFA | 1 x 5L<br>1 x ziplock bag | Fine sand with shell fragments<br>Munsell: 5Y 4/3 | Annelida (Polychaeta) | MJ, JAH | Moved 25m SW,<br>PSA |
| 49 | ECR_ENV_14 | 05-Apr-2023 | 01:35 | 0% | No sample | | | | MJ, JAH | Rock in grab jaws |
| 50 | ECR_ENV_14 | 05-Apr-2023 | 01:45 | 50% | MFB | 1 x 5L<br>1 x ziplock bag | Fine sand with shell fragments<br>Munsell: 5Y 4/3 | Annelida (Polychaeta) | MJ, JAH | Moved 25m SW,<br>PSA Spare |
| 51 | ECR_ENV_35 | 05-Apr-2023 | 03:28 | 70% | MFA | 1 x 1L<br>1 x ziplock bag | Fine sand<br>Munsell: 5Y 4/3 | Annelida (Polychaeta), Echinodermata (Ophiuroidea) | MJ, JAH | PSA |
| 52 | ECR_ENV_35 | 05-Apr-2023 | 03:39 | 70% | MFB | 1 x 1L<br>1 x ziplock bag | Fine sand<br>Munsell: 5Y 4/3 | Annelida (Polychaeta), Arthropoda (Crustacea) | MJ, JAH | PSA Spare |
| 53 | ECR_ENV_12 | 05-Apr-2023 | 05:43 | 90% | MFA | 1 x 1L<br>1 x ziplock bag | Fine sand with shell fragments<br>Munsell: 5Y 4/3 | Annelida (Polychaeta), Arthropoda | MJ, JAH | PSA |
| 54 | ECR_ENV_12 | 05-Apr-2023 | 06:00 | 90% | MFB | 1 x 1L<br>1 x ziplock bag | Fine sand with shell fragments<br>Munsell: 5Y 4/3 | Annelida (Polychaeta), Arthropoda, Echinodermata (Ophiuroidea) | MJ, JAH | PSA Spare |
| 55 | ECR_ENV_24 | 05-Apr-2023 | 14:04 | 90% | MFA | 1 x 1L<br>1 x ziplock bag | Fine sand<br>Munsell: 10YR 2/4 | Annelida (Polychaeta) | RH, MC | PSA |

# APPENDIX B FIELD SAMPLING LOGS

| SEABED SAMPLING LOG SHEET (Deck) | | | | | | | | | | FOR-ENV-0539 |
|---|---|---|---|---|---|---|---|---|---|---|
| Job No: | 54463 | | | Area: | North Sea | | | Sieve Size: 1mm | | |
| Project: | Caledonia OWF Phase 2 | | | | | | | Equipment: Mini-Hamon Grab, Day Grab | | |
| Client: | Caledonia Offshore Windfarm Limited | | | | | | | Vessel: MV *Ocean Endeavour* | | |
| Sample Number | Station Number | Date | Time | Penetration | Sample Retention | Sample Receptacle | Sediment Description | Fauna Description | Operator(s) | Comments |
| 56 | ECR_ENV_24 | 05-Apr-2023 | 14:12 | 90% | MFB | 1 x 1L<br>1 x ziplock bag | Fine sand<br>Munsell: 10YR 2/4 | Annelida (Polychaeta), Echinodermata (Ophiuroidea) | RH, MC | PSA Spare |
| 57 | ECR_ENV_09 | 05-Apr-2023 | 16:29 | 90% | MFA | 1 x 1L<br>1 x ziplock bag | Fine sand<br>Munsell: 10YR 2/1 | Annelida (Polychaeta) | RH, MC | PSA |
| 58 | ECR_ENV_09 | 05-Apr-2023 | 16:37 | 90% | MFB | 1 x 1L<br>1 x ziplock bag | Fine sand<br>Munsell: 10YR 2/1 | Annelida (Polychaeta), Echinodermata (Ophiuroidea) | RH, MC | PSA Spare |
| 59 | ECR_ENV_27 | 05-Apr-2023 | 18:17 | 90% | MFA | 1 x 1L<br>1 x ziplock bag | Fine sand<br>Munsell: 10YR 2/2 | Annelida (Polychaeta), Echinodermata (Spatangoidea) | RH, MC | PSA |
| 60 | ECR_ENV_27 | 05-Apr-2023 | 18:28 | 90% | MFB | 1 x 1L<br>1 x ziplock bag | Fine sand<br>Munsell: 10YR 2/2 | Annelida (Polychaeta) | RH, MC | PSA Spare |
| 61 | ECR_ENV_04 | 05-Apr-2023 | 21:30 | 90% | MFA | 1 x 1L<br>2 x ziplock bag | Fine sand<br>Munsell: 10YR 3/2 | Annelida (Polychaeta) | RH, MC | PSA<br>eDNA |
| 62 | ECR_ENV_04 | 05-Apr-2023 | 21:41 | 90% | MFB | 1 x 1L<br>2 x ziplock bag | Fine sand<br>Munsell: 10YR 3/2 | Annelida (Polychaeta) | RH, MC | PSA Spare<br>eDNA Spare |
| 63 | ECR_ENV_04 | 05-Apr-2023 | 21:58 | 80% | CHEM | 2 x 1L Jar | Fine sand<br>Munsell: 10YR 3/2 | No visible fauna | RH, MC | CHEM and CHEM Spare |
| 64 | ECR_ENV_19 | 06-Apr-2023 | 23:33 | 60% | MFA | 1 x 1L<br>1 x ziplock bag | Fine sand with shell fragments<br>Munsell: 5Y 4/4 | Annelida (Polychaeta) | MJ, JAH | PSA |
| 65 | ECR_ENV_19 | 06-Apr-2023 | 23:44 | 70% | MFB | 1 x 1L<br>1 x ziplock bag | Fine sand with shell fragments<br>Munsell: 5Y 4/4 | Annelida (Polychaeta), Echinodermata (Ophiuroidea) | MJ, JAH | PSA Spare |
| 66 | ECR_ENV_23 | 06-Apr-2023 | 01:21 | 60% | MFA | 1 x 1L<br>1 x ziplock bag | Fine sand with shell fragments<br>Munsell: 5Y 4/3 | Annelida (Polychaeta), Mollusca (Bivalvia, Scaphopoda) | MJ, JAH | PSA |
| 67 | ECR_ENV_23 | 06-Apr-2023 | 01:32 | 50% | MFB | 1 x 1L<br>1 x ziplock bag | Fine sand with shell fragments<br>Munsell: 5Y 4/3 | Annelida (Polychaeta), Mollusca (Bivalvia) | MJ, JAH | PSA Spare |
| 68 | ECR_ENV_06 | 06-Apr-2023 | 03:22 | 50% | MFA | 1 x 1L<br>1 x ziplock bag | Find sand<br>Munsell: 5Y 4/4 | Annelida (Polychaeta), Echinodermata (Ophiuroidea) | MJ, JAH | PSA |
| 69 | ECR_ENV_06 | 06-Apr-2023 | 03:33 | 40% | MFB | 1 x 1L<br>1 x ziplock bag | Find sand<br>Munsell: 5Y 4/4 | Annelida (Polychaeta), Echinodermata (Spatangoidea) | MJ, JAH | PSA Spare |
| 70 | ECR_ENV_13 | 06-Apr-2023 | 07:05 | 50% | MFA | 1 x 1L<br>2 x ziplock bag | Fine sand with shell fragments<br>Munsell: 5Y 4/3 | Annelida (Polychaeta), Echinodermata (Spatangoidea) | MJ, JAH | PSA<br>eDNA |

# APPENDIX B FIELD SAMPLING LOGS

| SEABED SAMPLING LOG SHEET (Deck) | | | | | | | | | | FOR-ENV-0539 |
|---|---|---|---|---|---|---|---|---|---|---|
| Job No: | 54463 | | Area: | North Sea | | | Sieve Size: 1mm | | | |
| Project: | Caledonia OWF Phase 2 | | | | | | Equipment: Mini-Hamon Grab, Day Grab | | | |
| Client: | Caledonia Offshore Windfarm Limited | | | | | | Vessel: MV *Ocean Endeavour* | | | |
| Sample Number | Station Number | Date | Time | Penetration | Sample Retention | Sample Receptacle | Sediment Description | Fauna Description | Operator(s) | Comments |
| 71 | ECR_ENV_13 | 06-Apr-2023 | 07:19 | 50% | MFB | 1 x 1L<br>2 x ziplock bag | Fine sand with shell fragments<br>Munsell: 5Y 4/3 | Annelida (Polychaeta), Echinodermata (Spatangoidea) | MJ, JAH | PSA Spare<br>eDNA Spare |
| 72 | ECR_ENV_13 | 06-Apr-2023 | 07:45 | 60% | CHEM | 2 x 1L Jar | Fine sand with shell fragments<br>Munsell: 5Y 4/3 | No visible fauna | MJ, JAH | CHEM and CHEM Spare |
| 73 | ECR_ENV_32 | 06-Apr-2023 | 09:44 | 1% | No sample | | | | MJ, JAH | Low retention |
| 74 | ECR_ENV_32 | 06-Apr-2023 | 09:53 | 5% | No sample | | | | MJ, JAH | Low retention |
| 75 | ECR_ENV_32 | 06-Apr-2023 | 10:02 | 2% | No sample | | | | MJ, JAH | Low retention |
| 76 | ECR_ENV_32 | 06-Apr-2023 | 10:17 | 0% | No sample | | | | MJ, JAH | Moved 10m SE<br>Rock in grab jaws |
| 77 | ECR_ENV_32 | 06-Apr-2023 | 10:27 | 0% | No sample | | | | MJ, JAH | Rock in grab jaws |
| 78 | ECR_ENV_32 | 06-Apr-2023 | 10:39 | 2% | No sample | | | | MJ, JAH | Low retention, Station abandoned |
| 79 | ECR_ENV_11 | 06-Apr-2023 | 12:03 | 0% | No sample | | | | RH, MC | Rock in grab jaws |
| 80 | ECR_ENV_11 | 06-Apr-2023 | 12:09 | 40% | MFA | 1 x 5L<br>1 x ziplock bag | Coarse sand with gravel, cobbles and shell fragments.<br>Munsell: 10YR 4/3<br>Cobble: 5% | Annelida (Polychaeta) | RH, MC | PSA |
| 81 | ECR_ENV_11 | 06-Apr-2023 | 12:15 | 0% | No sample | | | | RH, MC | Rock in grab jaws |
| 82 | ECR_ENV_11 | 06-Apr-2023 | 12:22 | 0% | No sample | | | | RH, MC | Rock in grab jaws |
| 83 | ECR_ENV_11 | 06-Apr-2023 | 12:31 | 0% | No sample | | | | RH, MC | Rock in grab jaws |
| 84 | ECR_ENV_11 | 06-Apr-2023 | 12:37 | 40% | MFB | 1 x 5L<br>1 x ziplock bag | Coarse sand with gravel, cobbles and shell fragments.<br>Munsell: 10YR 4/3<br>Cobble: 1% | Annelida (Polychaeta), Arthropoda | RH, MC | PSA Spare |
| 85 | ECR_ENV_22 | 06-Apr-2023 | 13:47 | 40% | MFA | 1 x 1L<br>1 x ziplock bag | Coarse sand with gravel, cobbles and shell fragments.<br>Munsell: 10YR 4/3<br>Cobble: 1% | Echinodermata (Ophiuroidea) | RH, MC | PSA |
| 86 | ECR_ENV_22 | 06-Apr-2023 | 13:54 | 40% | MFB | 1 x 1L<br>1 x ziplock bag | Coarse sand with gravel, cobbles and shell fragments.<br>Munsell: 10YR 4/3<br>Cobble: 1% | Annelida (Polychaeta), Mollusca (Scaphopoda) | RH, MC | PSA Spare |
| 87 | ECR_ENV_03 | 06-Apr-2023 | 15:00 | 40% | MFA | 1 x 1L<br>1 x ziplock bag | Fine to medium sand with occasional shell fragments<br>Munsell: 10YR 4/1 | Annelida (Polychaeta) | RH, MC | PSA |
| 88 | ECR_ENV_03 | 06-Apr-2023 | 15:06 | 30% | No sample | | | | RH, MC | |
| 89 | ECR_ENV_03 | 06-Apr-2023 | 15:13 | 50% | MFB | 1 x 1L<br>1 x ziplock bag | Fine to medium sand with occasional shell fragments<br>Munsell: 10YR 4/1 | Annelida (Polychaeta) | RH, MC | PSA Spare |
| 90 | ECR_ENV_29 | 13-Apr-2023 | 21:29 | 90% | MFA | 1 x 1L<br>2 x ziplock bag | Fine sand<br>Munsell: 10YR 2/1 | Annelida (Polychaeta) | RH, MC | PSA<br>eDNA |

# APPENDIX B FIELD SAMPLING LOGS

| SEABED SAMPLING LOG SHEET (Deck) | | | | | | | | | | FOR-ENV-0539 |
|---|---|---|---|---|---|---|---|---|---|---|
| Job No: | 54463 | | | Area: | North Sea | | | Sieve Size: 1mm | | |
| Project: | Caledonia OWF Phase 2 | | | | | | | Equipment: Mini-Hamon Grab, Day Grab | | |
| Client: | Caledonia Offshore Windfarm Limited | | | | | | | Vessel: MV *Ocean Endeavour* | | |
| Sample Number | Station Number | Date | Time | Penetration | Sample Retention | Sample Receptacle | Sediment Description | Fauna Description | Operator(s) | Comments |
| 91 | ECR_ENV_29 | 13-Apr-2023 | 21:38 | 90% | MFB | 1 x 1L<br>2 x ziplock bag | Fine sand<br>Munsell: 10YR 2/1 | Annelida (Polychaeta) | RH, MC | PSA Spare<br>eDNA Spare |
| 92 | ECR_ENV_29 | 13-Apr-2023 | 21:53 | 90% | CHEM | 2 x 1L Jar | Fine sand<br>Munsell: 10YR 2/1 | No visible fauna | RH, MC | CHEM and CHEM Spare |
| 93 | ECR_ENV_28 | 14-Apr-2023 | 23:08 | 80% | MFA | 1 x 1L<br>1 x ziplock bag | Fine sand with occasional shell fragments<br>Munsell: 5Y 4/2 | Annelida (Polychaeta) | MJ, JAH | PSA |
| 94 | ECR_ENV_28 | 14-Apr-2023 | 23:20 | 90% | MFB | 1 x 1L<br>1 x ziplock bag | Fine sand with occasional shell fragments<br>Munsell: 5Y 4/2 | Annelida (Polychaeta), Echinodermata (Ophiuroidea) | MJ, JAH | PSA Spare |
| 95 | ECR_ENV_10 | 14-Apr-2023 | 01:53 | 80% | MFA | 1 x 1L<br>1 x ziplock bag | Fine sand with occasional shell fragments<br>Munsell: 5Y 4/3 | Annelida (Polychaeta) | MJ, JAH | PSA |
| 96 | ECR_ENV_10 | 14-Apr-2023 | 02:06 | 80% | MFB | 1 x 1L<br>1 x ziplock bag | Fine sand with occasional shell fragments<br>Munsell: 5Y 4/3 | No visible fauna | MJ, JAH | PSA Spare |
| 97 | ECR_ENV_31 | 14-Apr-2023 | 05:44 | | No sample | | | | MJ, JAH | Contaminated, did not clean with bleach |
| 98 | ECR_ENV_31 | 14-Apr-2023 | 05:52 | 80% | MFA | 1 x 1L<br>2 x ziplock bag | Fine sand with occasional shell fragments<br>Munsell: 5Y 4/3 | Annelida (Polychaeta), Echinodermata, Mollusca (Gastropoda) | MJ, JAH | PSA<br>eDNA |
| 99 | ECR_ENV_31 | 14-Apr-2023 | 06:06 | 80% | MFB | 1 x 1L<br>2 x ziplock bag | Fine sand with occasional shell fragments<br>Munsell: 5Y 4/3 | Annelida (Polychaeta) | MJ, JAH | PSA Spare<br>eDNA Spare |
| 100 | ECR_ENV_31 | 14-Apr-2023 | 06:32 | 70% | CHEM | 2 x 1L Jar | Fine sand with occasional shell fragments<br>Munsell: 5Y 4/3 | No visible fauna | MJ, JAH | CHEM and CHEM Spare |
| 101 | ECR_ENV_34 | 14-Apr-2023 | 08:16 | 60% | MFA | 1 x 1L<br>1 x ziplock bag | Fine sand with occasional shell fragments<br>Munsell: 5Y 5/4 | Annelida (Polychaeta), Echinodermata | MJ, JAH | PSA |
| 102 | ECR_ENV_34 | 14-Apr-2023 | 08:24 | 70% | MFB | 1 x 1L<br>1 x ziplock bag | Fine sand with occasional shell fragments<br>Munsell: 5Y 5/4 | Annelida (Polychaeta) | MJ, JAH | PSA Spare |
| 103 | ECR_ENV_30 | 14-Apr-2023 | 09:58 | 20% | No sample | | | | MJ, JAH | Low retention |
| 104 | ECR_ENV_30 | 14-Apr-2023 | 10:10 | 50% | MFA | 1 x 1L<br>1 x ziplock bag | Fine sand with occasional shell fragments<br>Munsell: 5Y 5/3 | Arthropoda | MJ, JAH | PSA |
| 105 | ECR_ENV_30 | 14-Apr-2023 | 10:21 | 70% | MFB | 1 x 1L<br>1 x ziplock bag | Fine sand with occasional shell fragments<br>Munsell: 5Y 5/3 | No visible fauna | MJ, JAH | PSA Spare |
| 106 | ECR_ENV_05 | 14-Apr-2023 | 11:33 | 40% | MFA | 1 x 1L<br>1 x ziplock bag | Fine to medium sand with occasional shell fragments<br>Munsell: 2.5Y 3/1 | Annelida (Polychaeta), Echinodermata (Ophiuroidea) | RH, MC | PSA |

# APPENDIX B FIELD SAMPLING LOGS

| SEABED SAMPLING LOG SHEET (Deck) | | | | | | | | | | FOR-ENV-0539 |
|---|---|---|---|---|---|---|---|---|---|---|
| Job No: | 54463 | | Area: | North Sea | | | Sieve Size: 1mm | | | |
| Project: | Caledonia OWF Phase 2 | | | | | | Equipment: Mini-Hamon Grab, Day Grab | | | |
| Client: | Caledonia Offshore Windfarm Limited | | | | | | Vessel: MV *Ocean Endeavour* | | | |
| Sample Number | Station Number | Date | Time | Penetration | Sample Retention | Sample Receptacle | Sediment Description | Fauna Description | Operator(s) | Comments |
| 107 | ECR_ENV_05 | 14-Apr-2023 | 11:41 | 30% | No sample | | | | RH, MC | Low retention |
| 108 | ECR_ENV_05 | 14-Apr-2023 | 11:48 | 40% | MFB | 1 x 1L<br>1 x ziplock bag | Fine to medium sand with occasional shell fragments<br>Munsell: 2.5Y 3/1 | Annelida (Polychaeta), Echinodermata (Ophiuroidea) | RH, MC | PSA Spare |
| 109 | ECR_ENV_36 | 14-Apr-2023 | 14:37 | 40% | MFA | 1 x 1L<br>2 x ziplock bag | Fine sand with shell fragments<br>Munsell: 10Y 3/1 | Annelida (Polychaeta), Echinodermata | RH, MC | PSA<br>eDNA |
| 110 | ECR_ENV_36 | 14-Apr-2023 | 14:47 | 40% | MFB | 1 x 1L<br>2 x ziplock bag | Fine sand with shell fragments<br>Munsell: 10Y 3/1 | Annelida (Polychaeta), Echinodermata, Mollusca (Scaphopoda) | RH, MC | PSA Spare<br>eDNA Spare |
| 111 | ECR_ENV_36 | 14-Apr-2023 | 15:02 | 10% | No sample | | | | RH, MC | Low retention |
| 112 | ECR_ENV_36 | 14-Apr-2023 | 15:10 | 60% | CHEM | 2 x 1L Jar | Fine sand with shell fragments<br>Munsell: 10Y 3/1 | No visible fauna | RH, MC | CHEM and CHEM Spare |
| 113 | ECR_ENV_18 | 14-Apr-2023 | 16:58 | 60% | MFA | 1 x 5L<br>1 x ziplock bag | Coarse sand with shells<br>Munsell: 10YR 4/6 | Annelida (Polychaeta) | RH, MC | PSA |
| 114 | ECR_ENV_18 | 14-Apr-2023 | 17:06 | 90% | MFB | 2 x 5L<br>1 x ziplock bag | Coarse sand with shells<br>Munsell: 10YR 4/6 | No visible fauna | RH, MC | PSA Spare |

# APPENDIX B FIELD SAMPLING LOGS

Gardline

## Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | Vessel | MV *Ocean Endeavour* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | Vessel Reference Point (VRP) | COG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | Deployment Location | STBD Water Sampling Deployment | x | 6.7 | y | 21.94 | z | 2.93 |
| Primary Positioning System | Starpack 1 | | | Actual Coordinates derived from | Water Sampling Deployment NODE | | | | | | |
| Geodetic Reference System | Datum | WGS 84 - WGS 84 | Ellipsoid | WGS 84 | Projection | UTM zone 30N | | Vertical / Tidal Datum | VORF, LAT | | |

| Date | Fix Time (UTC) | Fix number | Line No/Stn No | Penetration | Sample Retention | Beacon Depth (m) | Observed Depth (m) | Reduced Depth LAT (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 02-Apr-2023 | 21:22 | 1 | ECR_ENV_17 | | 5 Litres | NA | 76 | 73 | 525678 | 6399919 | 525686 | 6399992 | -8 | -73 | 73 | 186 | SG | |
| 02-Apr-2023 | 21:45 | 2 | ECR_ENV_17 | | 5 Litres | NA | 77 | 74 | 525684 | 6399957 | 525686 | 6399992 | -1 | -36 | 36 | 182 | SG | |
| 03-Apr-2023 | 08:05 | 3 | ECR_ENV_26 | | 5 Litres | NA | 111 | 108 | 528556 | 6402538 | 528618 | 6402532 | -62 | 7 | 62 | 276 | PL | No sample. Misfire |
| 03-Apr-2023 | 08:27 | 4 | ECR_ENV_26 | | 5 Litres | NA | 111 | 109 | 528602 | 6402560 | 528618 | 6402532 | -16 | 29 | 33 | 331 | PL | |
| 03-Apr-2023 | 08:51 | 5 | ECR_ENV_26 | | 5 Litres | NA | 111 | 108 | 528598 | 6402526 | 528618 | 6402532 | -20 | -5 | 21 | 256 | PL | |
| 04-Apr-2023 | 07:14 | 6 | ECR_ENV_53 | | 5 Litres | NA | 30 | 28 | 525632 | 6394801 | 525615 | 6394765 | 16 | 36 | 40 | 24 | PL | |
| 04-Apr-2023 | 07:29 | 7 | ECR_ENV_53 | | 5 Litres | NA | 30 | 28 | 525630 | 6394791 | 525615 | 6394765 | 15 | 26 | 30 | 30 | PL | |
| 05-Apr-2023 | 19:36 | 8 | ECR_ENV_04 | | 5 Litres | NA | 82 | 81 | 526488 | 6410870 | 526524 | 6410862 | -36 | 7 | 37 | 282 | SG | |
| 05-Apr-2023 | 19:52 | 9 | ECR_ENV_04 | | 5 Litres | NA | 82 | 81 | 526498 | 6410883 | 526524 | 6410862 | -25 | 20 | 33 | 309 | SG | |
| 06-Apr-2023 | 04:53 | 10 | ECR_ENV_13 | | 5 Litres | 58 | 63 | 62 | 525883 | 6416013 | 525888 | 6415996 | -6 | 17 | 18 | 341 | PL | |
| 06-Apr-2023 | 05:13 | 11 | ECR_ENV_13 | | 5 Litres | 58 | 63 | 62 | 525902 | 6415991 | 525888 | 6415996 | 13 | -5 | 14 | 112 | PL | |
| 10-Apr-2023 | 12:40 | 12 | ECR_ENV_29 | | 5 Litres | 79 | 84 | 81 | 526601 | 6423571 | 526548 | 6423621 | 53 | -50 | 73 | 133 | SG | |
| 10-Apr-2023 | 12:59 | 13 | ECR_ENV_29 | | 5 Litres | 79 | 84 | 81 | 526556 | 6423561 | 526548 | 6423621 | 8 | -60 | 61 | 172 | SG | |
| 14-Apr-2023 | 03:30 | 14 | ECR_ENV_31 | | 5 Litres | 71 | 76 | 73 | 529139 | 6429266 | 529151 | 6429215 | -12 | 51 | 52 | 347 | PL | |
| 14-Apr-2023 | 03:52 | 15 | ECR_ENV_31 | | 5 Litres | 71 | 76 | 73 | 529134 | 6429256 | 529151 | 6429215 | -17 | 41 | 44 | 338 | PL | |
| 14-Apr-2023 | 13:01 | 16 | ECR_ENV_36 | | 5 Litres | 68 | 73 | 71 | 527580 | 6435820 | 527614 | 6435820 | -34 | 0 | 34 | 269 | SG | |
| 14-Apr-2023 | 13:19 | 17 | ECR_ENV_36 | | 5 Litres | 68 | 73 | 71 | 527564 | 6435820 | 527614 | 6435820 | -50 | 0 | 50 | 270 | SG | |

# APPENDIX B FIELD SAMPLING LOGS

| WATER SAMPLING LOG SHEET (Deck) | | | | | | | | | FOR-ENV-0540 |
|---|---|---|---|---|---|---|---|---|---|
| Job No: 54463 | | | Area: North Sea | | | | Volume: 5L | | |
| Project: Caledonia OWF Phase 2 | | | | | | | Equipment: Niskin Bottles | | |
| Client: Caledonia Offshore Windfarm Limited | | | | | | | Vessel: MV *Ocean Endeavour* | | |
| Sample Number | Station Number | Date | Time (UTC) | Load | Overall Station Depth (m) | Sample Depth (m) | Sample Analysis | Operator(s) | Comments |
| 1 | ECR_ENV_17 | 02-Apr-2023 | 21:22 | 5 Litres | 76 | 5 | CTD Profile, Water eDNA | MG, RH | Aborted. Tape inhibiting messenger |
| 2 | ECR_ENV_17 | 02-Apr-2023 | 21:22 | 5 Litres | 76 | 71 | CTD Profile, Water eDNA | MG, RH | Aborted. Tape inhibiting messenger |
| 3 | ECR_ENV_17 | 02-Apr-2023 | 21:22 | 5 Litres | 76 | 5 | CTD Profile, Water eDNA | RH, MC | Surface Primary |
| 4 | ECR_ENV_17 | 02-Apr-2023 | 21:22 | 5 Litres | 76 | 71 | CTD Profile, Water eDNA | RH, MC | Bottom Primary |
| 5 | ECR_ENV_17 | 02-Apr-2023 | 21:45 | 5 Litres | 77 | 5 | CTD Profile, Water eDNA | RH, MC | Surface Spare |
| 6 | ECR_ENV_17 | 02-Apr-2023 | 21:45 | 5 Litres | 77 | 71 | CTD Profile, Water eDNA | RH, MC | Bottom Spare |
| 7 | ECR_ENV_26 | 03-Apr-2023 | 08:05 | 5 Litres | 111 | 5 | CTD Profile, Water eDNA | HJ, MJ | No sample. Misfire |
| 8 | ECR_ENV_26 | 03-Apr-2023 | 08:05 | 5 Litres | 111 | 106 | CTD Profile, Water eDNA | HJ, MJ | No sample. Misfire |
| 9 | ECR_ENV_26 | 03-Apr-2023 | 08:27 | 5 Litres | 111 | 5 | CTD Profile, Water eDNA | JH, MJ | Surface Primary |
| 10 | ECR_ENV_26 | 03-Apr-2023 | 08:27 | 5 Litres | 111 | 106 | CTD Profile, Water eDNA | JH, MJ | Bottom Primary |
| 11 | ECR_ENV_26 | 03-Apr-2023 | 08:51 | 5 Litres | 111 | 5 | CTD Profile, Water eDNA | JH, MJ | Surface Spare |
| 12 | ECR_ENV_26 | 03-Apr-2023 | 08:51 | 5 Litres | 111 | 106 | CTD Profile, Water eDNA | JH, MJ | Bottom Spare |
| 13 | ECR_ENV_53 | 04-Apr-2023 | 07:14 | 5 Litres | 30 | 5 | CTD Profile, Water eDNA | JH, MJ | Surface Primary |
| 14 | ECR_ENV_53 | 04-Apr-2023 | 07:14 | 5 Litres | 30 | 25 | CTD Profile, Water eDNA | JH, MJ | Bottom Primary |
| 15 | ECR_ENV_53 | 04-Apr-2023 | 07:29 | 5 Litres | 30 | 5 | CTD Profile, Water eDNA | JH, MJ | Surface Spare |
| 16 | ECR_ENV_53 | 04-Apr-2023 | 07:29 | 5 Litres | 30 | 25 | CTD Profile, Water eDNA | JH, MJ | Bottom Spare |
| 17 | ECR_ENV_04 | 05-Apr-2023 | 19:36 | 5 Litres | 82 | 5 | CTD Profile, Water eDNA | RH, MC | Surface Primary |
| 18 | ECR_ENV_04 | 05-Apr-2023 | 19:36 | 5 Litres | 82 | 77 | CTD Profile, Water eDNA | RH, MC | Bottom Primary |

# APPENDIX B FIELD SAMPLING LOGS

| WATER SAMPLING LOG SHEET (Deck) | | | FOR-ENV-0540 |
|---|---|---|---|
| Job No: 54463 | Area: North Sea | Volume: 5L | |
| Project: Caledonia OWF Phase 2 | | Equipment: Niskin Bottles | |
| Client: Caledonia Offshore Windfarm Limited | | Vessel: MV *Ocean Endeavour* | |

| Sample Number | Station Number | Date | Time (UTC) | Load | Overall Station Depth (m) | Sample Depth (m) | Sample Analysis | Operator(s) | Comments |
|---|---|---|---|---|---|---|---|---|---|
| 19 | ECR_ENV_04 | 05-Apr-2023 | 19:52 | 5 Litres | 82 | 5 | CTD Profile, Water eDNA | RH, MC | Surface Spare |
| 20 | ECR_ENV_04 | 05-Apr-2023 | 19:52 | 5 Litres | 82 | 77 | CTD Profile, Water eDNA | RH, MC | Bottom Spare |
| 21 | ECR_ENV_13 | 05-Apr-2023 | 04:53 | 5 Litres | 63 | 5 | CTD Profile, Water eDNA | JH, MJ | Surface Primary |
| 22 | ECR_ENV_13 | 05-Apr-2023 | 04:53 | 5 Litres | 63 | 58 | CTD Profile, Water eDNA | JH, MJ | Bottom Primary |
| 23 | ECR_ENV_13 | 05-Apr-2023 | 05:13 | 5 Litres | 63 | 5 | CTD Profile, Water eDNA | JH, MJ | Surface Spare |
| 24 | ECR_ENV_13 | 05-Apr-2023 | 05:13 | 5 Litres | 63 | 58 | CTD Profile, Water eDNA | JH, MJ | Bottom Spare |
| 25 | ECR_ENV_29 | 10-Apr-2023 | 12:40 | 5 Litres | 84 | 5 | CTD Profile, Water eDNA | RH, MC | Surface Primary |
| 26 | ECR_ENV_29 | 10-Apr-2023 | 12:40 | 5 Litres | 84 | 79 | CTD Profile, Water eDNA | RH, MC | Bottom Primary |
| 27 | ECR_ENV_29 | 10-Apr-2023 | 12:59 | 5 Litres | 84 | 5 | CTD Profile, Water eDNA | RH, MC | Surface Spare |
| 28 | ECR_ENV_29 | 10-Apr-2023 | 12:59 | 5 Litres | 84 | 79 | CTD Profile, Water eDNA | RH, MC | Bottom Spare |
| 29 | ECR_ENV_31 | 14-Apr-2023 | 03:30 | 5 Litres | 76 | 5 | CTD Profile, Water eDNA | JH, MJ | Surface Primary |
| 30 | ECR_ENV_31 | 14-Apr-2023 | 03:30 | 5 Litres | 76 | 71 | CTD Profile, Water eDNA | JH, MJ | Bottom Primary |
| 31 | ECR_ENV_31 | 14-Apr-2023 | 03:52 | 5 Litres | 76 | 5 | CTD Profile, Water eDNA | JH, MJ | Surface Spare |
| 32 | ECR_ENV_31 | 14-Apr-2023 | 03:52 | 5 Litres | 76 | 71 | CTD Profile, Water eDNA | JH, MJ | Bottom Spare |
| 33 | ECR_ENV_36 | 14-Apr-2023 | 13:01 | 5 Litres | 73 | 5 | CTD Profile, Water eDNA | RH, MC | Surface Primary |
| 34 | ECR_ENV_36 | 14-Apr-2023 | 13:01 | 5 Litres | 73 | 68 | CTD Profile, Water eDNA | RH, MC | Bottom Primary |
| 35 | ECR_ENV_36 | 14-Apr-2023 | 13:19 | 5 Litres | 73 | 5 | CTD Profile, Water eDNA | RH, MC | Surface Spare |
| 36 | ECR_ENV_36 | 14-Apr-2023 | 13:19 | 5 Litres | 73 | 68 | CTD Profile, Water eDNA | RH, MC | Bottom Spare |

# APPENDIX B FIELD SAMPLING LOGS

Titan Environmental Surveys Limited

## Seabed Imagery Positioning Summary

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | | | Vessel | MV *Titan Discovery* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | | | Vessel Reference Point (VRP) | CoG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | | | Deployment Location | A-frame midpoint | x | -0.022 | y | -6.618 | z | 2.157 |
| Primary Positioning System | Applanix POS MV GNSS (c/w Atlas H10 PPP Corrections) | | | | | Actual Coordinates derived from | A-frame midpoint node vessel reference frame | | | | | | |
| Geodetic Reference System | Datum | WGS84 | | Ellipsoid | GRS80 | | Projection | UTM 30N | | | | Vertical / Tidal Datum | LAT VORF |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 02-May-2023 | 08:43:54 | 1 | ECR_ENV_59 | | | camera | | 521413 | 6395145 | 521403 | 6395099 | 10 | 46 | 47 | 12 | FB BL BH AM | |
| 02-May-2023 | 08:44:47 | 2 | ECR_ENV_59 | | | camera | | 521434 | 6395131 | 521403 | 6395099 | 31 | 31 | 44 | 45 | FB BL BH AM | |
| 02-May-2023 | 08:45:17 | 3 | ECR_ENV_59 | | | camera | | 521445 | 6395124 | 521403 | 6395099 | 42 | 25 | 48 | 59 | FB BL BH AM | |
| 02-May-2023 | 08:45:46 | 4 | ECR_ENV_59 | | | camera | | 521456 | 6395118 | 521403 | 6395099 | 53 | 19 | 56 | 71 | FB BL BH AM | |
| 02-May-2023 | 08:46:02 | 5 | ECR_ENV_59 | | | camera | | 521462 | 6395114 | 521403 | 6395099 | 59 | 15 | 61 | 76 | FB BL BH AM | |
| 02-May-2023 | 08:46:12 | 6 | ECR_ENV_59 | | | camera | | 521466 | 6395113 | 521403 | 6395099 | 63 | 14 | 65 | 78 | FB BL BH AM | |
| 02-May-2023 | 08:51:20 | 7 | ECR_ENV_59 | | | camera | | 521454 | 6395097 | 521403 | 6395099 | 51 | -2 | 51 | 92 | FB BL BH AM | |
| 02-May-2023 | 08:51:41 | 8 | ECR_ENV_59 | | | camera | | 521453 | 6395098 | 521403 | 6395099 | 50 | -1 | 50 | 91 | FB BL BH AM | |
| 02-May-2023 | 08:52:04 | 9 | ECR_ENV_59 | | | camera | | 521451 | 6395096 | 521403 | 6395099 | 48 | -3 | 48 | 93 | FB BL BH AM | Fix but no photo |
| 02-May-2023 | 08:52:24 | 10 | ECR_ENV_59 | | | camera | | 521446 | 6395095 | 521403 | 6395099 | 43 | -4 | 43 | 96 | FB BL BH AM | |
| 02-May-2023 | 08:52:52 | 11 | ECR_ENV_59 | | | camera | | 521439 | 6395093 | 521403 | 6395099 | 36 | -6 | 36 | 99 | FB BL BH AM | |
| 02-May-2023 | 08:53:09 | 12 | ECR_ENV_59 | | | camera | | 521437 | 6395090 | 521403 | 6395099 | 34 | -9 | 36 | 104 | FB BL BH AM | |
| 02-May-2023 | 08:53:21 | 13 | ECR_ENV_59 | | | camera | | 521436 | 6395088 | 521403 | 6395099 | 33 | -11 | 34 | 109 | FB BL BH AM | |
| 02-May-2023 | 08:54:10 | 14 | ECR_ENV_59 | | | camera | | 521425 | 6395088 | 521403 | 6395099 | 22 | -11 | 25 | 117 | FB BL BH AM | |
| 02-May-2023 | 08:54:44 | 15 | ECR_ENV_59 | | | camera | | 521421 | 6395092 | 521403 | 6395099 | 18 | -8 | 19 | 113 | FB BL BH AM | |
| 02-May-2023 | 08:55:00 | 16 | ECR_ENV_59 | | | camera | | 521417 | 6395094 | 521403 | 6395099 | 14 | -5 | 15 | 112 | FB BL BH AM | |
| 02-May-2023 | 08:55:24 | 17 | ECR_ENV_59 | | | camera | | 521414 | 6395097 | 521403 | 6395099 | 11 | -2 | 11 | 100 | FB BL BH AM | |
| 02-May-2023 | 08:55:54 | 18 | ECR_ENV_59 | | | camera | | 521416 | 6395102 | 521403 | 6395099 | 13 | 2 | 14 | 80 | FB BL BH AM | |
| 02-May-2023 | 08:56:10 | 19 | ECR_ENV_59 | | | camera | | 521414 | 6395103 | 521403 | 6395099 | 11 | 4 | 11 | 70 | FB BL BH AM | |
| 02-May-2023 | 08:56:31 | 20 | ECR_ENV_59 | | | camera | | 521410 | 6395098 | 521403 | 6395099 | 7 | -1 | 7 | 98 | FB BL BH AM | |
| 02-May-2023 | 08:56:51 | 21 | ECR_ENV_59 | | | camera | | 521412 | 6395094 | 521403 | 6395099 | 9 | -5 | 10 | 118 | FB BL BH AM | |
| 02-May-2023 | 08:57:51 | 22 | ECR_ENV_59 | | | camera | | 521425 | 6395084 | 521403 | 6395099 | 22 | -15 | 27 | 125 | FB BL BH AM | |
| 02-May-2023 | 08:58:11 | 23 | ECR_ENV_59 | | | camera | | 521429 | 6395079 | 521403 | 6395099 | 26 | -20 | 33 | 128 | FB BL BH AM | |
| 02-May-2023 | 08:58:42 | 24 | ECR_ENV_59 | | | camera | | 521438 | 6395071 | 521403 | 6395099 | 35 | -28 | 45 | 129 | FB BL BH AM | |
| 02-May-2023 | 08:58:57 | 25 | ECR_ENV_59 | | | camera | | 521442 | 6395068 | 521403 | 6395099 | 39 | -31 | 50 | 129 | FB BL BH AM | |
| 02-May-2023 | 09:29:42 | 26 | ECR_ENV_58 | | | camera | | 523031 | 6394103 | 523103 | 6394101 | -73 | 2 | 73 | 272 | FB BL BH AM | |
| 02-May-2023 | 09:30:04 | 27 | ECR_ENV_58 | | | camera | | 523038 | 6394100 | 523103 | 6394101 | -65 | -1 | 65 | 269 | FB BL BH AM | |
| 02-May-2023 | 09:30:43 | 28 | ECR_ENV_58 | | | camera | | 523050 | 6394095 | 523103 | 6394101 | -54 | -6 | 54 | 263 | FB BL BH AM | |
| 02-May-2023 | 09:31:42 | 29 | ECR_ENV_58 | | | camera | | 523073 | 6394086 | 523103 | 6394101 | -30 | -15 | 33 | 243 | FB BL BH AM | |
| 02-May-2023 | 09:32:03 | 30 | ECR_ENV_58 | | | camera | | 523078 | 6394087 | 523103 | 6394101 | -25 | -15 | 29 | 239 | FB BL BH AM | |
| 02-May-2023 | 09:32:24 | 31 | ECR_ENV_58 | | | camera | | 523085 | 6394087 | 523103 | 6394101 | -19 | -14 | 23 | 232 | FB BL BH AM | |
| 02-May-2023 | 09:32:50 | 32 | ECR_ENV_58 | | | camera | | 523094 | 6394088 | 523103 | 6394101 | -10 | -14 | 17 | 215 | FB BL BH AM | |
| 02-May-2023 | 09:34:25 | 33 | ECR_ENV_58 | | | camera | | 523143 | 6394090 | 523103 | 6394101 | 39 | -11 | 41 | 106 | FB BL BH AM | |
| 02-May-2023 | 09:34:51 | 34 | ECR_ENV_58 | | | camera | | 523139 | 6394095 | 523103 | 6394101 | 35 | -7 | 36 | 100 | FB BL BH AM | |
| 02-May-2023 | 09:35:19 | 35 | ECR_ENV_58 | | | camera | | 523131 | 6394099 | 523103 | 6394101 | 28 | -2 | 28 | 94 | FB BL BH AM | |
| 02-May-2023 | 09:35:48 | 36 | ECR_ENV_58 | | | camera | | 523125 | 6394104 | 523103 | 6394101 | 22 | 2 | 22 | 84 | FB BL BH AM | |
| 02-May-2023 | 09:36:20 | 37 | ECR_ENV_58 | | | camera | | 523121 | 6394107 | 523103 | 6394101 | 18 | 5 | 19 | 74 | FB BL BH AM | |

# APPENDIX B FIELD SAMPLING LOGS

Titan Environmental Surveys Limited

## Seabed Imagery Positioning Summary

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | | Vessel | MV *Titan Discovery* | | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | | Vessel Reference Point (VRP) | CoG | | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | | Deployment Location | A-frame midpoint | x | -0.022 | y | -6.618 | z | 2.157 |
| Primary Positioning System | Applanix POS MV GNSS (c/w Atlas H10 PPP Corrections) | | | | Actual Coordinates derived from | A-frame midpoint node vessel reference frame | | | | | | |
| Geodetic Reference System | Datum | WGS84 | Ellipsoid | GRS80 | | Projection | UTM 30N | | | Vertical / Tidal Datum | LAT VORF | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 02-May-2023 | 09:36:52 | 38 | ECR_ENV_58 | | | camera | | 523115 | 6394107 | 523103 | 6394101 | 12 | 6 | 13 | 65 | FB BL BH AM | |
| 02-May-2023 | 09:37:00 | 39 | ECR_ENV_58 | | | camera | | 523112 | 6394107 | 523103 | 6394101 | 9 | 5 | 10 | 59 | FB BL BH AM | Fix but no photo |
| 02-May-2023 | 09:37:42 | 40 | ECR_ENV_58 | | | camera | | 523104 | 6394108 | 523103 | 6394101 | 1 | 6 | 6 | 10 | FB BL BH AM | |
| 02-May-2023 | 09:38:10 | 41 | ECR_ENV_58 | | | camera | | 523100 | 6394111 | 523103 | 6394101 | -3 | 9 | 10 | 344 | FB BL BH AM | |
| 02-May-2023 | 09:38:24 | 42 | ECR_ENV_58 | | | camera | | 523098 | 6394112 | 523103 | 6394101 | -5 | 10 | 12 | 333 | FB BL BH AM | |
| 02-May-2023 | 09:38:38 | 43 | ECR_ENV_58 | | | camera | | 523095 | 6394111 | 523103 | 6394101 | -8 | 9 | 12 | 320 | FB BL BH AM | |
| 02-May-2023 | 09:38:41 | 44 | ECR_ENV_58 | | | camera | | 523095 | 6394112 | 523103 | 6394101 | -8 | 10 | 13 | 322 | FB BL BH AM | Fix but no photo |
| 02-May-2023 | 09:39:35 | 45 | ECR_ENV_58 | | | camera | | 523088 | 6394118 | 523103 | 6394101 | -16 | 17 | 23 | 317 | FB BL BH AM | |
| 02-May-2023 | 10:11:39 | 46 | ECR_ENV_57 | | | camera | | 526944 | 6392999 | 527011 | 6392977 | -68 | 22 | 71 | 288 | FB BL BH AM | |
| 02-May-2023 | 10:11:52 | 47 | ECR_ENV_57 | | | camera | | 526946 | 6392997 | 527011 | 6392977 | -66 | 21 | 69 | 287 | FB BL BH AM | |
| 02-May-2023 | 10:12:56 | 48 | ECR_ENV_57 | | | camera | | 526956 | 6392977 | 527011 | 6392977 | -56 | 0 | 56 | 270 | FB BL BH AM | |
| 02-May-2023 | 10:13:24 | 49 | ECR_ENV_57 | | | camera | | 526963 | 6392970 | 527011 | 6392977 | -48 | -7 | 49 | 262 | FB BL BH AM | |
| 02-May-2023 | 10:13:59 | 50 | ECR_ENV_57 | | | camera | | 526976 | 6392963 | 527011 | 6392977 | -35 | -14 | 38 | 248 | FB BL BH AM | |
| 02-May-2023 | 10:14:19 | 51 | ECR_ENV_57 | | | camera | | 526985 | 6392959 | 527011 | 6392977 | -27 | -18 | 32 | 236 | FB BL BH AM | |
| 02-May-2023 | 10:14:39 | 52 | ECR_ENV_57 | | | camera | | 526991 | 6392956 | 527011 | 6392977 | -20 | -21 | 29 | 225 | FB BL BH AM | |
| 02-May-2023 | 10:15:05 | 53 | ECR_ENV_57 | | | camera | | 526991 | 6392955 | 527011 | 6392977 | -21 | -22 | 30 | 223 | FB BL BH AM | |
| 02-May-2023 | 10:15:29 | 54 | ECR_ENV_57 | | | camera | | 526993 | 6392952 | 527011 | 6392977 | -19 | -25 | 31 | 217 | FB BL BH AM | |
| 02-May-2023 | 10:17:00 | 55 | ECR_ENV_57 | | | camera | | 527027 | 6392953 | 527011 | 6392977 | 16 | -24 | 28 | 147 | FB BL BH AM | |
| 02-May-2023 | 10:17:25 | 56 | ECR_ENV_57 | | | camera | | 527030 | 6392960 | 527011 | 6392977 | 18 | -17 | 25 | 133 | FB BL BH AM | |
| 02-May-2023 | 10:17:53 | 57 | ECR_ENV_57 | | | camera | | 527031 | 6392970 | 527011 | 6392977 | 20 | -7 | 21 | 110 | FB BL BH AM | |
| 02-May-2023 | 10:18:45 | 58 | ECR_ENV_57 | | | camera | | 527029 | 6392981 | 527011 | 6392977 | 18 | 4 | 18 | 77 | FB BL BH AM | |
| 02-May-2023 | 10:19:12 | 59 | ECR_ENV_57 | | | camera | | 527027 | 6392984 | 527011 | 6392977 | 16 | 8 | 18 | 64 | FB BL BH AM | |
| 02-May-2023 | 10:19:33 | 60 | ECR_ENV_57 | | | camera | | 527025 | 6392987 | 527011 | 6392977 | 14 | 10 | 17 | 53 | FB BL BH AM | |
| 02-May-2023 | 10:19:51 | 61 | ECR_ENV_57 | | | camera | | 527020 | 6392987 | 527011 | 6392977 | 9 | 10 | 13 | 41 | FB BL BH AM | |
| 02-May-2023 | 10:20:40 | 62 | ECR_ENV_57 | | | camera | | 527012 | 6392981 | 527011 | 6392977 | 0 | 4 | 4 | 6 | FB BL BH AM | |
| 02-May-2023 | 10:53:26 | 63 | ECR_ENV_56 | | | camera | | 525987 | 6393621 | 526019 | 6393557 | -32 | 64 | 72 | 333 | FB BL BH AM | |
| 02-May-2023 | 10:53:36 | 64 | ECR_ENV_56 | | | camera | | 525989 | 6393619 | 526019 | 6393557 | -30 | 63 | 69 | 334 | FB BL BH AM | |
| 02-May-2023 | 10:53:47 | 65 | ECR_ENV_56 | | | camera | | 525991 | 6393617 | 526019 | 6393557 | -28 | 61 | 67 | 335 | FB BL BH AM | |
| 02-May-2023 | 10:54:08 | 66 | ECR_ENV_56 | | | camera | | 525995 | 6393614 | 526019 | 6393557 | -24 | 57 | 62 | 337 | FB BL BH AM | |
| 02-May-2023 | 10:54:32 | 67 | ECR_ENV_56 | | | camera | | 526000 | 6393610 | 526019 | 6393557 | -19 | 53 | 57 | 340 | FB BL BH AM | |
| 02-May-2023 | 10:54:53 | 68 | ECR_ENV_56 | | | camera | | 526004 | 6393605 | 526019 | 6393557 | -16 | 49 | 51 | 342 | FB BL BH AM | |
| 02-May-2023 | 10:55:05 | 69 | ECR_ENV_56 | | | camera | | 526006 | 6393604 | 526019 | 6393557 | -13 | 48 | 49 | 345 | FB BL BH AM | |
| 02-May-2023 | 10:55:28 | 70 | ECR_ENV_56 | | | camera | | 526010 | 6393599 | 526019 | 6393557 | -9 | 42 | 43 | 347 | FB BL BH AM | |
| 02-May-2023 | 10:55:46 | 71 | ECR_ENV_56 | | | camera | | 526013 | 6393596 | 526019 | 6393557 | -6 | 39 | 40 | 351 | FB BL BH AM | |
| 02-May-2023 | 10:56:11 | 72 | ECR_ENV_56 | | | camera | | 526017 | 6393592 | 526019 | 6393557 | -2 | 35 | 35 | 357 | FB BL BH AM | |
| 02-May-2023 | 10:56:31 | 73 | ECR_ENV_56 | | | camera | | 526021 | 6393588 | 526019 | 6393557 | 1 | 31 | 31 | 2 | FB BL BH AM | |
| 02-May-2023 | 10:57:01 | 74 | ECR_ENV_56 | | | camera | | 526026 | 6393584 | 526019 | 6393557 | 7 | 27 | 28 | 14 | FB BL BH AM | |

# APPENDIX B FIELD SAMPLING LOGS

Titan Environmental Surveys Limited

## Seabed Imagery Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | | Vessel | MV *Titan Discovery* | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | | Vessel Reference Point (VRP) | CoG | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | | Deployment Location | A-frame midpoint | x | -0.022 | y | -6.618 | z | 2.157 |
| Primary Positioning System | Applanix POS MV GNSS (c/w Atlas H10 PPP Corrections) | | | | Actual Coordinates derived from | A-frame midpoint node vessel reference frame | | | | | | |
| Geodetic Reference System | Datum | WGS84 | Ellipsoid | GRS80 | | Projection | UTM 30N | | | Vertical / Tidal Datum | LAT VORF | |

| Date | Time (UTC/GMT) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 02-May-2023 | 10:57:21 | 75 | ECR_ENV_56 | | | camera | | 526029 | 6393580 | 526019 | 6393557 | 10 | 24 | 26 | 23 | FB BL BH AM | |
| 02-May-2023 | 10:57:48 | 76 | ECR_ENV_56 | | | camera | | 526034 | 6393577 | 526019 | 6393557 | 15 | 20 | 25 | 36 | FB BL BH AM | |
| 02-May-2023 | 10:58:45 | 77 | ECR_ENV_56 | | | camera | | 526053 | 6393556 | 526019 | 6393557 | 34 | 0 | 34 | 90 | FB BL BH AM | |
| 02-May-2023 | 10:58:59 | 78 | ECR_ENV_56 | | | camera | | 526053 | 6393551 | 526019 | 6393557 | 33 | -6 | 34 | 99 | FB BL BH AM | |
| 02-May-2023 | 10:59:25 | 79 | ECR_ENV_56 | | | camera | | 526050 | 6393542 | 526019 | 6393557 | 30 | -15 | 34 | 116 | FB BL BH AM | |
| 02-May-2023 | 10:59:41 | 80 | ECR_ENV_56 | | | camera | | 526047 | 6393537 | 526019 | 6393557 | 27 | -19 | 34 | 125 | FB BL BH AM | |
| 02-May-2023 | 11:00:03 | 81 | ECR_ENV_56 | | | camera | | 526042 | 6393534 | 526019 | 6393557 | 23 | -23 | 32 | 135 | FB BL BH AM | |
| 02-May-2023 | 11:00:26 | 82 | ECR_ENV_56 | | | camera | | 526037 | 6393529 | 526019 | 6393557 | 18 | -27 | 33 | 147 | FB BL BH AM | |
| 02-May-2023 | 11:00:39 | 83 | ECR_ENV_56 | | | camera | | 526034 | 6393527 | 526019 | 6393557 | 15 | -29 | 33 | 153 | FB BL BH AM | |
| 02-May-2023 | 11:01:07 | 84 | ECR_ENV_56 | | | camera | | 526026 | 6393526 | 526019 | 6393557 | 6 | -30 | 31 | 168 | FB BL BH AM | |
| 02-May-2023 | 18:04:36 | 85 | ECR_ENV_56_A | | | camera | | 526083 | 6393556 | 526019 | 6393557 | 64 | -1 | 64 | 91 | FB BL BH AM | |
| 02-May-2023 | 18:04:55 | 86 | ECR_ENV_56_A | | | camera | | 526079 | 6393555 | 526019 | 6393557 | 59 | -2 | 59 | 92 | FB BL BH AM | |
| 02-May-2023 | 18:05:07 | 87 | ECR_ENV_56_A | | | camera | | 526076 | 6393554 | 526019 | 6393557 | 57 | -2 | 57 | 92 | FB BL BH AM | |
| 02-May-2023 | 18:05:19 | 88 | ECR_ENV_56_A | | | camera | | 526072 | 6393555 | 526019 | 6393557 | 53 | -2 | 53 | 92 | FB BL BH AM | |
| 02-May-2023 | 18:05:37 | 89 | ECR_ENV_56_A | | | camera | | 526067 | 6393555 | 526019 | 6393557 | 47 | -1 | 47 | 92 | FB BL BH AM | |
| 02-May-2023 | 18:05:47 | 90 | ECR_ENV_56_A | | | camera | | 526064 | 6393556 | 526019 | 6393557 | 44 | 0 | 44 | 90 | FB BL BH AM | |
| 02-May-2023 | 18:06:13 | 91 | ECR_ENV_56_A | | | camera | | 526052 | 6393557 | 526019 | 6393557 | 33 | 0 | 33 | 90 | FB BL BH AM | |
| 02-May-2023 | 18:07:00 | 92 | ECR_ENV_56_A | | | camera | | 526040 | 6393564 | 526019 | 6393557 | 21 | 7 | 22 | 71 | FB BL BH AM | |
| 02-May-2023 | 18:07:23 | 93 | ECR_ENV_56_A | | | camera | | 526043 | 6393573 | 526019 | 6393557 | 24 | 17 | 29 | 55 | FB BL BH AM | |
| 02-May-2023 | 18:07:46 | 94 | ECR_ENV_56_A | | | camera | | 526040 | 6393582 | 526019 | 6393557 | 20 | 26 | 33 | 38 | FB BL BH AM | |
| 02-May-2023 | 18:08:06 | 95 | ECR_ENV_56_A | | | camera | | 526036 | 6393591 | 526019 | 6393557 | 17 | 34 | 38 | 27 | FB BL BH AM | |
| 02-May-2023 | 18:08:20 | 96 | ECR_ENV_56_A | | | camera | | 526029 | 6393596 | 526019 | 6393557 | 10 | 40 | 41 | 14 | FB BL BH AM | |
| 02-May-2023 | 18:08:40 | 97 | ECR_ENV_56_A | | | camera | | 526019 | 6393601 | 526019 | 6393557 | -1 | 44 | 44 | 359 | FB BL BH AM | Fix but no photo |

# APPENDIX B FIELD SAMPLING LOGS

**SEABED IMAGERY LOG SHEET (Deck)** **FOR-ENV-0538**

Job No: 54463 | Area: North Sea | Scale: Green Laser Lines (105mm)

Project: Caledonia OWF Phase 2 - Nearshore | Equipment: Shallow Water Camera

Client: Caledonia Offshore Windfarm Limited | Vessel: MV *Titan Discovery*

| Station Number | Date | Time on Overlay Start | Time on Overlay Finish | Duration | HDD File Name(s) | Sediment Description | Fauna Description | Operator(s) | No. of Photos | First Fix No. | Last Fix No. | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ECR_ENV_59 | 02-May-2023 | 08:44:17 | 08:59:35 | 00:15:18 | SD: 2023-05-02_08-44-17_ECR_ENV_59_KBERG, 2023-05-02_08-44-31_ECR_ENV_59_1CAM;<br>HD: 00016.MTS, 00017.MTS | Rippled sand with shell fragments | No visible fauna | WA | 24 | 1 | 25 | High Swell. No fix 9 due to QINSY error |
| ECR_ENV_58 | 02-May-2023 | 09:29:18 | 09:39:47 | 00:10:29 | SD: 2023-05-02_09-29-17_ECR_ENV_58_KBERG, 2023-05-02_09-29-24_ECR_ENV_58_1CAM;<br>HD: 00018.MTS | Rippled sand with shell fragments | Chordata (Actinopterygii), Echinodermata (Asteroidea) | WA | 18 | 26 | 45 | High Swell. No fix 39 and 44 due to QINSY error |
| ECR_ENV_57 | 02-May-2023 | 10:11:08 | 10:21:01 | 00:09:53 | SD: 2023-05-02_10-11-08_ECR_ENV_57_KBERG, 2023-05-02_10-11-15_ECR_ENV_57_1CAM;<br>HD: 00019.MTS | Rippled Sand | Annelida | WA | 17 | 46 | 62 | Bright ambient light, moderate swell |
| ECR_ENV_56 | 02-May-2023 | 10:52:24 | 11:01:32 | 00:09:08 | SD: 2023-05-02_10-52-23_ECR_ENV_56_KBERG, 2023-05-02_10-52-33_ECR_ENV_56_1CAM;<br>HD: 00020.MTS | Boulders and cobbles, areas of rippled sand | Cnidaria (Actiniaria), Echinoderma (Echinoidea) | WA | 22 | 63 | 84 | Moderate swell, ambient light affecting HD footage, images poor quality due to swell and suspended solids |
| ECR_ENV_56_A | 02-May-2023 | 18:03:37 | 18:09:43 | 00:06:06 | SD: 2023-05-02_18-03-36_ECR_ENV_56_A_KBERG, 2023-05-02_18-03-58_ECR_ENV_56_A_1CAM;<br>HD: 00021.MTS | Boulders and cobbles, areas of rippled sand | Cnidaria (Actiniaria), Echinoderma (Echinoidea) | WA | 12 | 85 | 96 | High swell, ambient light affecting HD footage, images poor quality due to swell and suspended solids. Transect aborted due to conditions. |

# APPENDIX B FIELD SAMPLING LOGS

Titan Environmental Surveys Limited

## Seafloor Sampling Positioning Summary

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Job No | 54463 | | | | Vessel | MV *Titan Discovery* | | | | | |
| Client | Caledonia Offshore Windfarm Limited | | | | Vessel Reference Point (VRP) | CoG | | | | | |
| Project Name | Caledonia OWF Phase 2 | | | | Deployment Location | A-frame midpoint | x | -0.022 | y | -6.618 | z 2.157 |
| Primary Positioning System | Applanix POS MV GNSS (c/w Atlas H10 PPP Corrections) | | | | Actual Coordinates derived from | A-frame midpoint node vessel reference frame | | | | | |
| Geodetic Reference System | Datum | WGS84 | Ellipsoid | GRS80 | | Projection | UTM 30N | | Vertical / Tidal Datum | LAT VORF | |

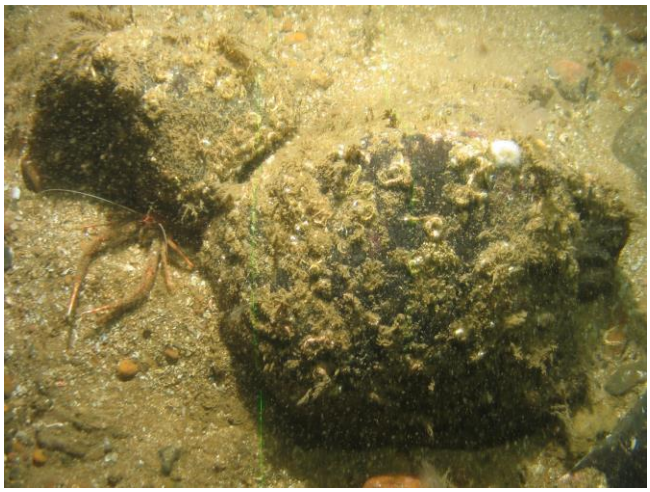
| Date | Time (UTC) | Fix number | Stn No | Penetration | Sample Retention | Retention | Observed Seafloor Depth (m) | Actual coordinates | | Target coordinates | | Offset from target | | | | Surveyor | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Easting | Northing | Easting | Northing | dE | dN | Range | Bearing | | |
| 08-May-2023 | 11:45 | 1 | ECR_ENV_59 | 30% | NS | - | 29 | 521408 | 6395107 | 521403 | 6395099 | 5 | 8 | 9 | 35 | FB BL BH AM | 30% |
| 08-May-2023 | 11:56 | 2 | ECR_ENV_59 | 40% | MFA | 1 x 1L, 1 x Ziplock | 29 | 521406 | 6395099 | 521403 | 6395099 | 3 | 0 | 3 | 87 | FB BL BH AM | MFA & PSA 40% |
| 08-May-2023 | 12:13 | 3 | ECR_ENV_59 | 40% | MFB | 1 x 1L, 1 x Ziplock | 29 | 521403 | 6395097 | 521403 | 6395099 | 0 | -2 | 2 | 178 | FB BL BH AM | MFB & Spare 40% |
| 08-May-2023 | 12:40 | 4 | ECR_ENV_58 | 20% | NS | - | 19 | 523099 | 6394104 | 523103 | 6394101 | -4 | 3 | 5 | 303 | FB BL BH AM | 30% |
| 08-May-2023 | 12:48 | 5 | ECR_ENV_58 | 30% | NS | - | 19 | 523113 | 6394100 | 523103 | 6394101 | 9 | -1 | 9 | 99 | FB BL BH AM | 20% |
| 08-May-2023 | 12:55 | 6 | ECR_ENV_58 | 20% | NS | - | 20 | 523103 | 6394109 | 523103 | 6394101 | 0 | 8 | 8 | 359 | FB BL BH AM | 20% |
| 08-May-2023 | 13:20 | 7 | ECR_ENV_58_A | 40% | MFA | 1 x 1L, 1 x Ziplock | 20 | 523133 | 6394097 | 523103 | 6394101 | 30 | -5 | 30 | 99 | FB BL BH AM | Moved 25m to East. MFA & PSA 40% |
| 08-May-2023 | 13:29 | 8 | ECR_ENV_58_A | 40% | MFB | 1 x 1L, 1 x Ziplock | 20 | 523132 | 6394099 | 523103 | 6394101 | 29 | -2 | 29 | 94 | FB BL BH AM | MFB & Spare 40% |
| 08-May-2023 | 14:10 | 9 | ECR_ENV_57 | 30% | NS | - | 13 | 527009 | 6392980 | 527011 | 6392977 | -2 | 3 | 3 | 323 | FB BL BH AM | 30% |
| 08-May-2023 | 14:15 | 10 | ECR_ENV_57 | 20% | NS | - | 13 | 527013 | 6392973 | 527011 | 6392977 | 2 | -4 | 5 | 151 | FB BL BH AM | 30% |
| 08-May-2023 | 14:21 | 11 | ECR_ENV_57 | 40% | MFA | 1 x 1L, 1 x Ziplock | 13 | 527012 | 6392983 | 527011 | 6392977 | 1 | 6 | 6 | 8 | FB BL BH AM | MFA & PSA 40% |
| 08-May-2023 | 14:28 | 12 | ECR_ENV_57 | 40% | MFB | 1 x 1L, 1 x Ziplock | 13 | 527016 | 6392977 | 527011 | 6392977 | 5 | 0 | 5 | 85 | FB BL BH AM | MFB & Spare 40% |
| 08-May-2023 | 15:43 | 13 | ECR_ENV_58_A | 40% | NS | - | 19 | 523128 | 6394094 | 523103 | 6394101 | 24 | -8 | 25 | 108 | FB BL BH AM | |
| 08-May-2023 | 15:50 | 14 | ECR_ENV_58_A | 60% | CHEM | 2 x 1L Amber Glass Jar | 19 | 523134 | 6394097 | 523103 | 6394101 | 31 | -4 | 31 | 98 | FB BL BH AM | |

# APPENDIX B FIELD SAMPLING LOGS

| SEABED SAMPLING LOG SHEET (Deck) | | | | | | | | | | FOR-ENV-0539 |
|---|---|---|---|---|---|---|---|---|---|---|
| Job No: | 54463 | | | Area: | North Sea | | | Sieve Size: 1mm | | |
| Project: | Caledonia OWF Nearshore | | | | | | | Equipment: Mini-Hamon Grab, Day Grab | | |
| Client: | Caledonia Offshore Windfarm Limited | | | | | | | Vessel: MV *Titan Discovery* | | |
| Sample Number | Station Number | Date | Time | Penetration | Sample Retention | Sample Receptacle | Sediment Description | Fauna Description | Operator(s) | Comments |
| 1 | ECR_ENV_59 | 08-May-23 | 11:45:25 | 30% | No Sample | - | Medium sand with shell fragments<br>Munsell: 10YR 5/4 | | WA | Low retention |
| 2 | ECR_ENV_59 | 08-May-23 | 11:56:00 | 40% | MFA | 1 x 1L<br>1 x Ziplock | Medium sand with shell fragments<br>Munsell: 10YR 5/4 | Annelida | WA | PSA |
| 3 | ECR_ENV_59 | 08-May-23 | 12:13:36 | 40% | MFB | 1 x 1L<br>1 x Ziplock | Medium sand with shell fragments<br>Munsell: 10YR 5/4 | Annelida | WA | Spare |
| 4 | ECR_ENV_58 | 08-May-23 | 12:40:50 | 20% | No Sample | - | Sand with shell fragments<br>Munsell: 2.5Y 5/3 | | WA | Low retention |
| 5 | ECR_ENV_58 | 08-May-23 | 12:48:46 | 30% | No Sample | - | Sand with shell fragments<br>Munsell: 2.5Y 5/3 | | WA | Low retention |
| 6 | ECR_ENV_58 | 08-May-23 | 12:55:28 | 20% | No Sample | - | Sand with shell fragments<br>Munsell: 2.5Y 5/3 | | WA | Low retention |
| 7 | ECR_ENV_58_A | 08-May-23 | 13:20:47 | 40% | MFA | 1 x 1L<br>1 x Ziplock | Fine sand with shell fragments<br>Munsell: 2.5Y 5/3 | Annelida | WA | Station relocated 25m E, 10kg weights added |
| 8 | ECR_ENV_58_A | 08-May-23 | 13:29:22 | 40% | MFB | 1 x 1L<br>1 x Ziplock | Fine sand with shell fragments<br>Munsell: 2.5Y 5/3 | Annelida | WA | No grab/dump tray photo |
| 9 | ECR_ENV_57 | 08-May-23 | 14:10:14 | 30% | No Sample | - | Fine sand with shell fragments<br>Munsell: 2.5Y 5/4 | | WA | 10kg weights added |
| 10 | ECR_ENV_57 | 08-May-23 | 14:15:41 | 20% | No Sample | - | Fine sand with shell fragments<br>Munsell: 2.5Y 5/4 | | WA | |
| 11 | ECR_ENV_57 | 08-May-23 | 14:21:35 | 40% | MFA | 1 x 1L<br>1 x Ziplock | Fine sand with shell fragments<br>Munsell: 2.5Y 5/4 | Annelida | WA | |
| 12 | ECR_ENV_57 | 08-May-23 | 14:28:40 | 40% | MFB | 1 x 1L<br>1 x Ziplock | Fine sand with shell fragments<br>Munsell: 2.5Y 5/4 | Annelida | WA | |
| 13 | ECR_ENV_58_A | 08-May-23 | 15:43:40 | 40% | No Sample | - | Fine sand with shell fragments<br>Munsell: 2.5Y 5/3 | | WA | Day Grab, Low retention, grab photo says "CHEM" |
| 14 | ECR_ENV_58_A | 08-May-23 | 15:50:40 | 60% | CHEM | 2 x 1L Amber Glass Jar | Fine sand with shell fragments<br>Munsell: 2.5Y 5/3 | Annelida | WA | Day Grab, CHEM & CHEM Spare |

# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS

# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS



**Station:** ECR_ENV_01
**Fix:** 1188 **E:** 527975 **N:** 6394901 **Depth (m):** 31

**Sediment Description:**
Scattered cobbles with soft sediment and shell fragments

**Faunal Description:**
Annelida (Serpulidae *stet.*), Arthropoda (Galatheoidea *stet.*), Bryozoa (*Alcyonidium diaphanum*), Epifauna, Faunal turf



**Station:** ECR_ENV_01
**Fix:** 1189 **E:** 527973 **N:** 6394901 **Depth (m):** 31

**Sediment Description:**
Scattered cobbles with soft sediment and shell fragments

**Faunal Description:**
Annelida (Serpulidae *stet.*), Bryozoa (Flustridae *indet.*), Cnidaria (Actiniaria *indet.* 002), Echinodermata (*Crossaster papposus*), Mollusca (*Calliostoma stet*), Epifauna, Faunal turf, Porifera indet. GL0003




**Station:** ECR_ENV_01
**Fix:** 38 **E:** 527942 **N:** 6394892 **Depth (m):** 35
**Retention:** MFA

**Sediment Description:**
Coarse sand with gravel, cobble and shell fragments

**Faunal Description:**
Annelida (Polychaeta), Mollusca (Bivalvia)



**Station:** ECR_ENV_01
**Fix:** 38 **E:** 527942 **N:** 6394892 **Depth (m):** 35
**Retention:** MFA

**Sediment Description:**
Coarse sand with gravel, cobble and shell fragments

**Faunal Description:**
Annelida (Polychaeta), Mollusca (Bivalvia)

# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS






**Station:** ECR_ENV_02
**Fix:** 44 **E:** 525001 **N:** 6404672 **Depth (m):** 88
**Retention:** MFB

**Sediment Description:**
Fine sand with shell fragments

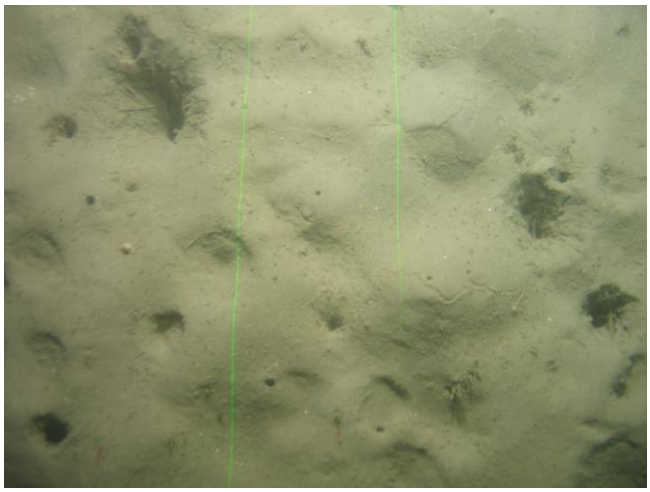
**Faunal Description:**
Annelida (Polychaeta), Echinodermata (Echinoidea, Ophiuroidea)

**Station:** ECR_ENV_02
**Fix:** 44 **E:** 525001 **N:** 6404672 **Depth (m):** 88
**Retention:** MFB

**Sediment Description:**
Fine sand with shell fragments

**Faunal Description:**
Annelida (Polychaeta), Echinodermata (Echinoidea, Ophiuroidea)

# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS



**Station:** ECR_ENV_03
**Fix:** 1958 **E:** 527853 **N:** 6422309 **Depth (m):** 72

**Sediment Description:**
Soft sediment with faunal tracks and burrows

**Faunal Description:**
Animalia tube, Mollusca (*Euspira indet* 001)



**Station:** ECR_ENV_03
**Fix:** 1992 **E:** 527785 **N:** 6422356 **Depth (m):** 72

**Sediment Description:**
Soft sediment with bioturbation

**Faunal Description:**
Cnidaria (Pennatuloidea *stet.*)




**Station:** ECR_ENV_03
**Fix:** 89 **E:** 527818 **N:** 6422343 **Depth (m):** 74
**Retention:** MFB

**Sediment Description:**
Fine to medium sand with occasional shell fragments

**Faunal Description:**
Annelida (Polychaeta)




**Station:** ECR_ENV_03
**Fix:** 89 **E:** 527818 **N:** 6422343 **Depth (m):** 74
**Retention:** MFB

**Sediment Description:**
Fine to medium sand with occasional shell fragments

**Faunal Description:**
Annelida (Polychaeta)

# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS







**Station:** ECR_ENV_04
**Fix:** 61 **E:** 526525 **N:** 6410862 **Depth (m):** 83
**Retention:** MFA

**Sediment Description:**
Fine sand

**Faunal Description:**
Annelida (Polychaeta)

**Station:** ECR_ENV_04
**Fix:** 61 **E:** 526525 **N:** 6410862 **Depth (m):** 83
**Retention:** MFA

**Sediment Description:**
Fine sand

**Faunal Description:**
Annelida (Polychaeta)







**Station:** ECR_ENV_05
**Fix:** 108 **E:** 529726 **N:** 6431936 **Depth (m):** 75
**Retention:** MFB

**Sediment Description:**
Fine to medium sand with occasional shell fragments

**Faunal Description:**
Annelida (Polychaeta), Echinodermata (Ophiuroidea)

**Station:** ECR_ENV_05
**Fix:** 108 **E:** 529726 **N:** 6431936 **Depth (m):** 75
**Retention:** MFB

**Sediment Description:**
Fine to medium sand with occasional shell fragments

**Faunal Description:**
Annelida (Polychaeta), Echinodermata (Ophiuroidea)

# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS







**Station:** ECR_ENV_06
**Fix:** 69 **E:** 527935 **N:** 6415793 **Depth (m):** 71
**Retention:** MFB

**Sediment Description:**
Find sand

**Faunal Description:**
Annelida (Polychaeta), Echinodermata (Spatangoidea)

**Station:** ECR_ENV_06
**Fix:** 69 **E:** 527935 **N:** 6415793 **Depth (m):** 71
**Retention:** MFB

**Sediment Description:**
Find sand

**Faunal Description:**
Annelida (Polychaeta), Echinodermata (Spatangoidea)






**Station:** ECR_ENV_07
**Fix:** 16 **E:** 523782 **N:** 6395200 **Depth (m):** 32
**Retention:** MFB

**Sediment Description:**
Coarse sand with shell fragments

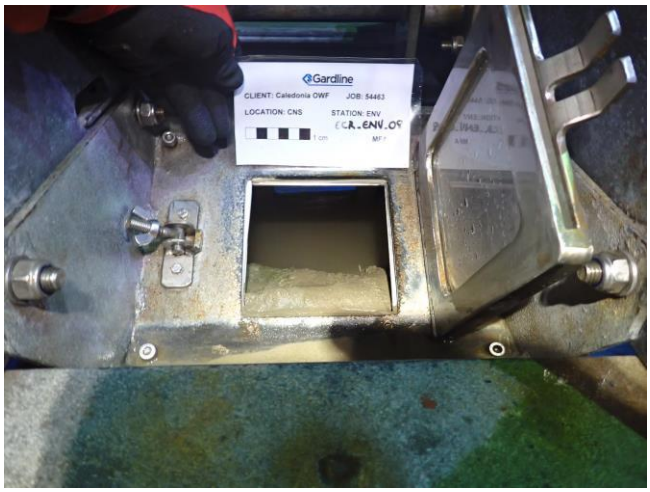
**Faunal Description:**
Annelida (Polychaeta), Echinodermata (Echinoidea)

**Station:** ECR_ENV_07
**Fix:** 16 **E:** 523782 **N:** 6395200 **Depth (m):** 32
**Retention:** MFB

**Sediment Description:**
Coarse sand with shell fragments

**Faunal Description:**
Annelida (Polychaeta), Echinodermata (Echinoidea)

# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS




**Station:** ECR_ENV_08
**Fix:** 4 **E:** 526635 **N:** 6398008 **Depth (m):** 73
**Retention:** MFA

**Sediment Description:**
Fine sand with shell fragments

**Faunal Description:**
Annelida (Polychaeta)




**Station:** ECR_ENV_08
**Fix:** 4 **E:** 526635 **N:** 6398008 **Depth (m):** 73
**Retention:** MFA

**Sediment Description:**
Fine sand with shell fragments

**Faunal Description:**
Annelida (Polychaeta)




**Station:** ECR_ENV_09
**Fix:** 58 **E:** 524422 **N:** 6407869 **Depth (m):** 87
**Retention:** MFB

**Sediment Description:**
Fine sand

**Faunal Description:**
Annelida (Polychaeta), Echinodermata (Ophiuroidea)



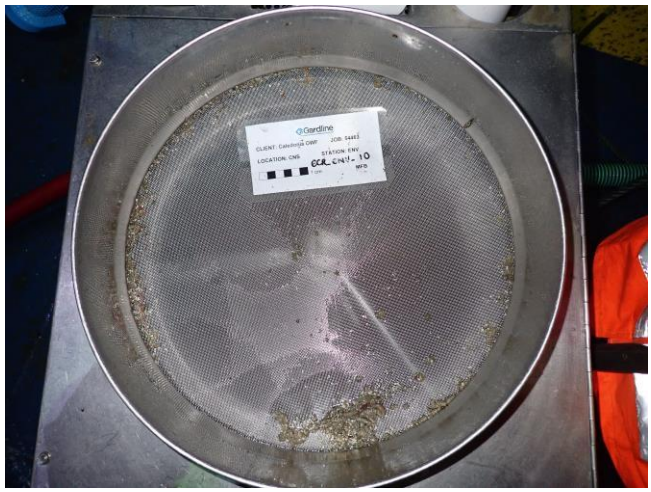

**Station:** ECR_ENV_09
**Fix:** 58 **E:** 524422 **N:** 6407869 **Depth (m):** 87
**Retention:** MFB

**Sediment Description:**
Fine sand

**Faunal Description:**
Annelida (Polychaeta), Echinodermata (Ophiuroidea)

# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS



**Station:** ECR_ENV_10
**Fix:** 96 **E:** 526896 **N:** 6427550 **Depth (m):** 78
**Retention:** MFB

**Sediment Description:**
Fine sand with occasional shell fragments

**Faunal Description:**
No visible fauna

**Station:** ECR_ENV_10
**Fix:** 96 **E:** 526896 **N:** 6427550 **Depth (m):** 78
**Retention:** MFB

**Sediment Description:**
Fine sand with occasional shell fragments

**Faunal Description:**
No visible fauna







**Station:** ECR_ENV_11
**Fix:** 84 **E:** 527396 **N:** 6419340 **Depth (m):** 68
**Retention:** MFB

**Sediment Description:**
Coarse sand with gravel, cobbles and shell fragments.

**Faunal Description:**
Annelida (Polychaeta), Arthropoda (Arthropoda)

**Station:** ECR_ENV_11
**Fix:** 84 **E:** 527396 **N:** 6419340 **Depth (m):** 68
**Retention:** MFB

**Sediment Description:**
Coarse sand with gravel, cobbles and shell fragments.

**Faunal Description:**
Annelida (Polychaeta), Arthropoda (Arthropoda)

# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS







**Station:** ECR_ENV_12
**Fix:** 54 **E:** 527239 **N:** 6406197 **Depth (m):** 90
**Retention:** MFB

**Sediment Description:**
Fine sand with shell fragments

**Faunal Description:**
Annelida (Polychaeta), Arthropoda (Arthropoda), Echinodermata (Ophiuroidea)

**Station:** ECR_ENV_12
**Fix:** 54 **E:** 527239 **N:** 6406197 **Depth (m):** 90
**Retention:** MFB

**Sediment Description:**
Fine sand with shell fragments

**Faunal Description:**
Annelida (Polychaeta), Arthropoda (Arthropoda), Echinodermata (Ophiuroidea)







**Station:** ECR_ENV_13
**Fix:** 70 **E:** 525887 **N:** 6415998 **Depth (m):** 63
**Retention:** MFA

**Sediment Description:**
Fine sand with shell fragments

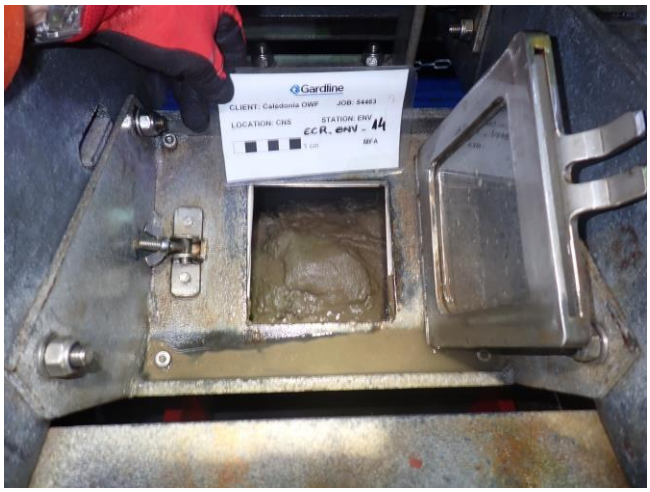
**Faunal Description:**
Annelida (Polychaeta), Echinodermata (Spatangoidea)

**Station:** ECR_ENV_13
**Fix:** 70 **E:** 525887 **N:** 6415998 **Depth (m):** 63
**Retention:** MFA

**Sediment Description:**
Fine sand with shell fragments

**Faunal Description:**
Annelida (Polychaeta), Echinodermata (Spatangoidea)

# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS







**Station:** ECR_ENV_14
**Fix:** 48 **E:** 528122 **N:** 6404750 **Depth (m):** 69
**Retention:** MFA

**Sediment Description:**
Fine sand with shell fragments

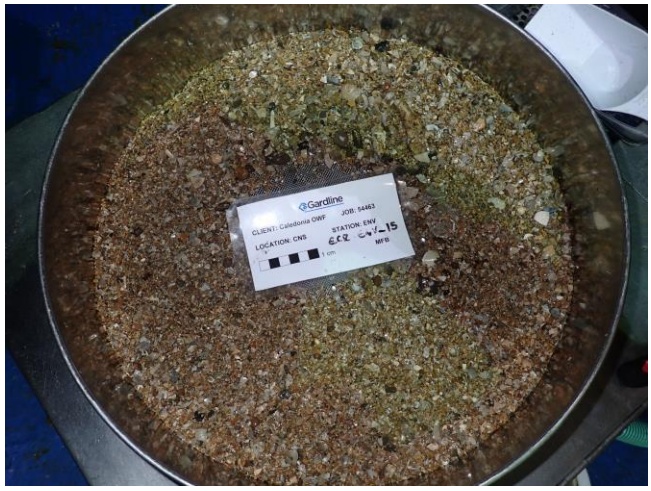
**Faunal Description:**
Annelida (Polychaeta)

**Station:** ECR_ENV_14
**Fix:** 48 **E:** 528122 **N:** 6404750 **Depth (m):** 69
**Retention:** MFA

**Sediment Description:**
Fine sand with shell fragments

**Faunal Description:**
Annelida (Polychaeta)




**Station:** ECR_ENV_15
**Fix:** 8 **E:** 524537 **N:** 6397553 **Depth (m):** 52
**Retention:** MFB

**Sediment Description:**
Coarse sand and shell fragments

**Faunal Description:**
No visible fauna

**Station:** ECR_ENV_15
**Fix:** 8 **E:** 524537 **N:** 6397553 **Depth (m):** 52
**Retention:** MFB

**Sediment Description:**
Coarse sand and shell fragments

**Faunal Description:**
No visible fauna

# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS






**Station:** ECR_ENV_16
**Fix:** 18 **E:** 525422 **N:** 6395982 **Depth (m):** 40
**Retention:** MFB

**Sediment Description:**
Coarse sand with shell fragments

**Faunal Description:**
Annelida (Polychaeta), Mollusca (Bivalvia)

**Station:** ECR_ENV_16
**Fix:** 18 **E:** 525422 **N:** 6395982 **Depth (m):** 40
**Retention:** MFB

**Sediment Description:**
Coarse sand with shell fragments

**Faunal Description:**
Annelida (Polychaeta), Mollusca (Bivalvia)






**Station:** ECR_ENV_17
**Fix:** 26 **E:** 525687 **N:** 6399992 **Depth (m):** 75
**Retention:** MFA

**Sediment Description:**
Fine sand with shell fragments

**Faunal Description:**
Echinodermata (Echinoidea), Mollusca (Bivalvia, Scaphopoda)

**Station:** ECR_ENV_17
**Fix:** 26 **E:** 525687 **N:** 6399992 **Depth (m):** 75
**Retention:** MFA

**Sediment Description:**
Fine sand with shell fragments

**Faunal Description:**
Echinodermata (Echinoidea), Mollusca (Bivalvia, Scaphopoda)

# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS




**Station:** ECR_ENV_18
**Fix:** 113 **E:** 529459 **N:** 6435227 **Depth (m):** 69
**Retention:** MFA

**Sediment Description:**
Coarse sand with shells

**Faunal Description:**
Annelida (Polychaeta)




**Station:** ECR_ENV_18
**Fix:** 113 **E:** 529459 **N:** 6435227 **Depth (m):** 69
**Retention:** MFA

**Sediment Description:**
Coarse sand with shells

**Faunal Description:**
Annelida (Polychaeta)




**Station:** ECR_ENV_19
**Fix:** 64 **E:** 526291 **N:** 6412284 **Depth (m):** 79
**Retention:** MFA

**Sediment Description:**
Fine sand with shell fragments

**Faunal Description:**
Annelida (Polychaeta)




**Station:** ECR_ENV_19
**Fix:** 64 **E:** 526291 **N:** 6412284 **Depth (m):** 79
**Retention:** MFA

**Sediment Description:**
Fine sand with shell fragments

**Faunal Description:**
Annelida (Polychaeta)

# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS






**Station:** ECR_ENV_20
**Fix:** 9 **E:** 522010 **N:** 6396359 **Depth (m):** 32
**Retention:** MFA

**Sediment Description:**
Coarse sand with gravel, cobbles and shell fragments

**Faunal Description:**
Mollusca (Bivalvia)

**Station:** ECR_ENV_20
**Fix:** 9 **E:** 522010 **N:** 6396359 **Depth (m):** 32
**Retention:** MFA

**Sediment Description:**
Coarse sand with gravel, cobbles and shell fragments

**Faunal Description:**
Mollusca (Bivalvia)






**Station:** ECR_ENV_21
**Fix:** 34 **E:** 528145 **N:** 6396764 **Depth (m):** 48
**Retention:** MFB

**Sediment Description:**
Fine sand with cobbles and shell fragments

**Faunal Description:**
No visible fauna

**Station:** ECR_ENV_21
**Fix:** 34 **E:** 528145 **N:** 6396764 **Depth (m):** 48
**Retention:** MFB

**Sediment Description:**
Fine sand with cobbles and shell fragments

**Faunal Description:**
No visible fauna

# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS







**Station:** ECR_ENV_22
**Fix:** 85 **E:** 526411 **N:** 6421397 **Depth (m):** 64
**Retention:** MFA

**Sediment Description:**
Coarse sand with gravel, cobbles and shell fragments.

**Faunal Description:**
Echinodermata (Ophiuroidea)

**Station:** ECR_ENV_22
**Fix:** 85 **E:** 526411 **N:** 6421397 **Depth (m):** 64
**Retention:** MFA

**Sediment Description:**
Coarse sand with gravel, cobbles and shell fragments.

**Faunal Description:**
Echinodermata (Ophiuroidea)







**Station:** ECR_ENV_23
**Fix:** 67 **E:** 526713 **N:** 6414358 **Depth (m):** 74
**Retention:** MFB

**Sediment Description:**
Fine sand with shell fragments

**Faunal Description:**
Annelida (Polychaeta), Mollusca (Bivalvia)

**Station:** ECR_ENV_23
**Fix:** 67 **E:** 526713 **N:** 6414358 **Depth (m):** 74
**Retention:** MFB

**Sediment Description:**
Fine sand with shell fragments

**Faunal Description:**
Annelida (Polychaeta), Mollusca (Bivalvia)

# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS






**Station:** ECR_ENV_24
**Fix:** 56 **E:** 526033 **N:** 6407681 **Depth (m):** 92
**Retention:** MFB

**Sediment Description:**
Fine sand

**Faunal Description:**
Annelida (Polychaeta), Echinodermata (Ophiuroidea)

**Station:** ECR_ENV_24
**Fix:** 56 **E:** 526033 **N:** 6407681 **Depth (m):** 92
**Retention:** MFB

**Sediment Description:**
Fine sand

**Faunal Description:**
Annelida (Polychaeta), Echinodermata (Ophiuroidea)






**Station:** ECR_ENV_25
**Fix:** 19 **E:** 528432 **N:** 6398321 **Depth (m):** 75
**Retention:** MFA

**Sediment Description:**
Fine sand with shell fragments

**Faunal Description:**
Annelida (Polychaeta), Echinodermata (Echinoidea)

**Station:** ECR_ENV_25
**Fix:** 19 **E:** 528432 **N:** 6398321 **Depth (m):** 75
**Retention:** MFA

**Sediment Description:**
Fine sand with shell fragments

**Faunal Description:**
Annelida (Polychaeta), Echinodermata (Echinoidea)

# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS




**Station:** ECR_ENV_26
**Fix:** 30 **E:** 528617 **N:** 6402536 **Depth (m):** 109
**Retention:** MFB

**Sediment Description:**
Fine sand

**Faunal Description:**
Annelida (Polychaeta), Echinodermata (Echinoidea, Ophiuroidea)



**Station:** ECR_ENV_26
**Fix:** 30 **E:** 528617 **N:** 6402536 **Depth (m):** 109
**Retention:** MFB

**Sediment Description:**
Fine sand

**Faunal Description:**
Annelida (Polychaeta), Echinodermata (Echinoidea, Ophiuroidea)




**Station:** ECR_ENV_27
**Fix:** 59 **E:** 527954 **N:** 6408299 **Depth (m):** 90
**Retention:** MFA

**Sediment Description:**
Fine sand

**Faunal Description:**
Annelida (Polychaeta), Echinodermata (Spatangoidea)



**Station:** ECR_ENV_27
**Fix:** 59 **E:** 527954 **N:** 6408299 **Depth (m):** 90
**Retention:** MFA

**Sediment Description:**
Fine sand

**Faunal Description:**
Annelida (Polychaeta), Echinodermata (Spatangoidea)

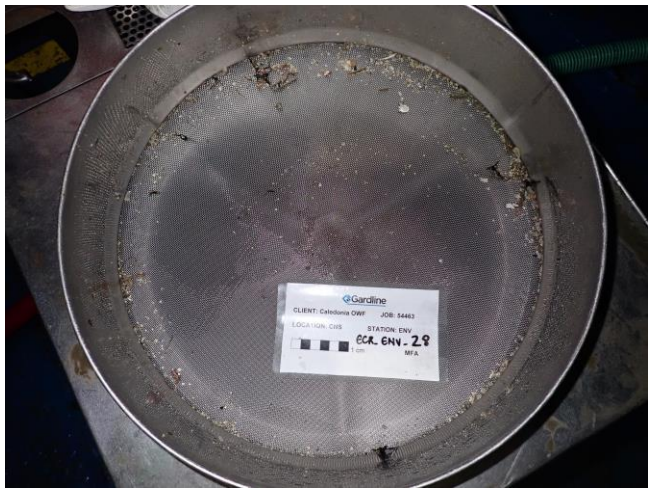
# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS




**Station:** ECR_ENV_28
**Fix:** 93 **E:** 527325 **N:** 6425046 **Depth (m):** 78
**Retention:** MFA

**Sediment Description:**
Fine sand with occasional shell fragments

**Faunal Description:**
Annelida (Polychaeta)




**Station:** ECR_ENV_28
**Fix:** 93 **E:** 527325 **N:** 6425046 **Depth (m):** 78
**Retention:** MFA

**Sediment Description:**
Fine sand with occasional shell fragments

**Faunal Description:**
Annelida (Polychaeta)




**Station:** ECR_ENV_29
**Fix:** 90 **E:** 526547 **N:** 6423620 **Depth (m):** 83
**Retention:** MFA

**Sediment Description:**
Fine sand

**Faunal Description:**
Annelida (Polychaeta)




**Station:** ECR_ENV_29
**Fix:** 90 **E:** 526547 **N:** 6423620 **Depth (m):** 83
**Retention:** MFA

**Sediment Description:**
Fine sand

**Faunal Description:**
Annelida (Polychaeta)

# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS




**Station:** ECR_ENV_30
**Fix:** 104 **E:** 527787 **N:** 6431898 **Depth (m):** 74
**Retention:** MFA

**Sediment Description:**
Fine sand with occasional shell fragments

**Faunal Description:**
Arthropoda (Arthropoda)




**Station:** ECR_ENV_30
**Fix:** 104 **E:** 527787 **N:** 6431898 **Depth (m):** 74
**Retention:** MFA

**Sediment Description:**
Fine sand with occasional shell fragments

**Faunal Description:**
Arthropoda (Arthropoda)




**Station:** ECR_ENV_31
**Fix:** 98 **E:** 529151 **N:** 6429213 **Depth (m):** 76
**Retention:** MFA

**Sediment Description:**
Fine sand with occasional shell fragments

**Faunal Description:**
Annelida (Polychaeta), Echinodermata (Echinodermata), Mollusca (Gastropoda)




**Station:** ECR_ENV_31
**Fix:** 98 **E:** 529151 **N:** 6429213 **Depth (m):** 76
**Retention:** MFA

**Sediment Description:**
Fine sand with occasional shell fragments

**Faunal Description:**
Annelida (Polychaeta), Echinodermata (Echinodermata), Mollusca (Gastropoda)

# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS



**Station:** ECR_ENV_32
**Fix:** 73 **E:** 525128 **N:** 6418432 **Depth (m):** 62
**Retention:** No Sample

**Sediment Description:**

**Faunal Description:**
No visible fauna



**Station:** ECR_ENV_32
**Fix:** 74 **E:** 525128 **N:** 6418432 **Depth (m):** 62
**Retention:** No Sample

**Sediment Description:**

**Faunal Description:**
No visible fauna




**Station:** ECR_ENV_33
**Fix:** 24 **E:** 527772 **N:** 6399745 **Depth (m):** 92
**Retention:** MFA

**Sediment Description:**
Fine sand with shell fragments

**Faunal Description:**
Annelida (Polychaeta), Echinodermata (Echinoidea)

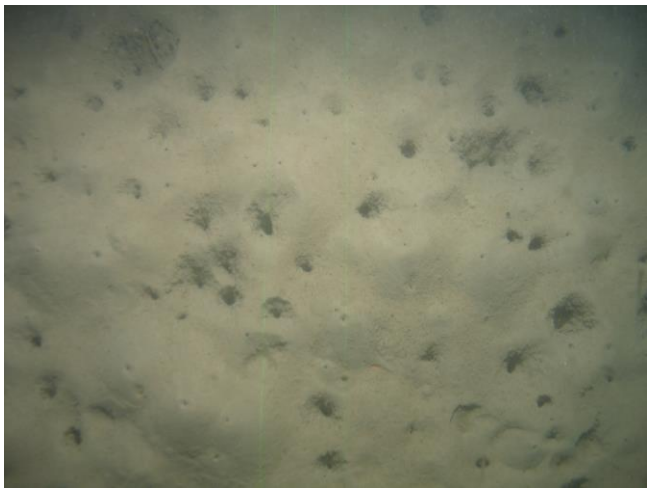


**Station:** ECR_ENV_33
**Fix:** 24 **E:** 527772 **N:** 6399745 **Depth (m):** 92
**Retention:** MFA

**Sediment Description:**
Fine sand with shell fragments

**Faunal Description:**
Annelida (Polychaeta), Echinodermata (Echinoidea)

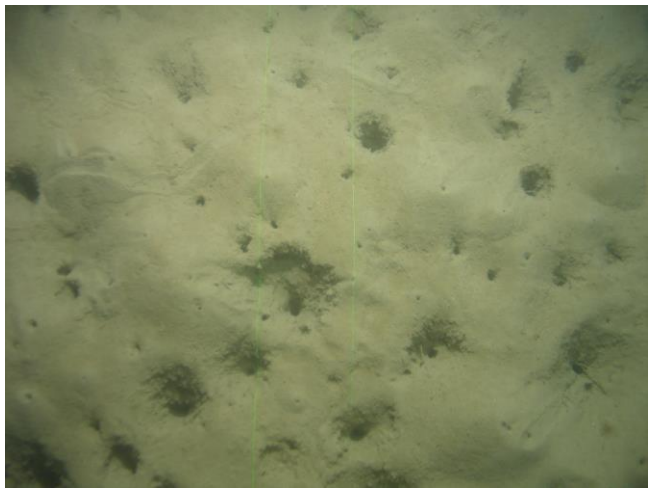
# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS



**Station:** ECR_ENV_34
**Fix:** 2209 **E:** 526335 **N:** 6430518 **Depth (m):** 73

**Sediment Description:**
Soft sediment with bioturbation

**Faunal Description:**
Animalia tube



**Station:** ECR_ENV_34
**Fix:** 2244 **E:** 526427 **N:** 6430518 **Depth (m):** 73

**Sediment Description:**
Soft sedimnet with faunal tracks and burrows

**Faunal Description:**
Animalia tube




**Station:** ECR_ENV_34
**Fix:** 102 **E:** 526390 **N:** 6430516 **Depth (m):** 76
**Retention:** MFB

**Sediment Description:**
Fine sand with occasional shell fragments

**Faunal Description:**
Annelida (Polychaeta)



**Station:** ECR_ENV_34
**Fix:** 102 **E:** 526390 **N:** 6430516 **Depth (m):** 76
**Retention:** MFB

**Sediment Description:**
Fine sand with occasional shell fragments

**Faunal Description:**
Annelida (Polychaeta)

# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS






**Station:** ECR_ENV_35
**Fix:** 51 **E:** 528928 **N:** 6405415 **Depth (m):** 78
**Retention:** MFA

**Sediment Description:**
Fine sand

**Faunal Description:**
Annelida (Polychaeta), Echinodermata (Ophiuroidea)

**Station:** ECR_ENV_35
**Fix:** 51 **E:** 528928 **N:** 6405415 **Depth (m):** 78
**Retention:** MFA

**Sediment Description:**
Fine sand

**Faunal Description:**
Annelida (Polychaeta), Echinodermata (Ophiuroidea)






**Station:** ECR_ENV_36
**Fix:** 110 **E:** 527617 **N:** 6435819 **Depth (m):** 73
**Retention:** MFB

**Sediment Description:**
Fine sand with shell fragments

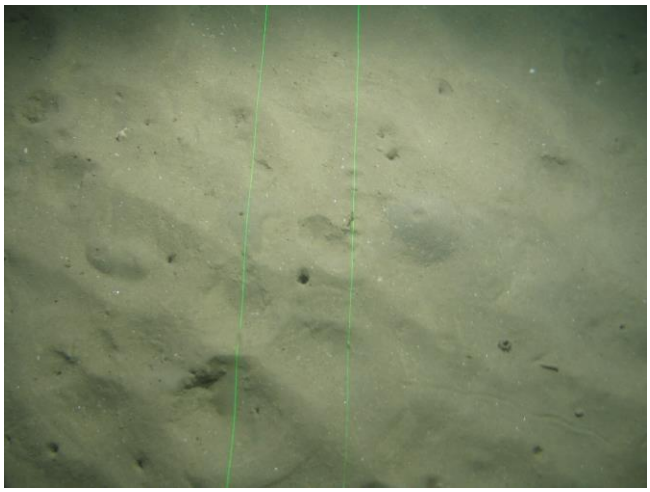
**Faunal Description:**
Annelida (Polychaeta), Echinodermata (Echinodermata), Mollusca (Scaphopoda)

**Station:** ECR_ENV_36
**Fix:** 110 **E:** 527617 **N:** 6435819 **Depth (m):** 73
**Retention:** MFB

**Sediment Description:**
Fine sand with shell fragments

**Faunal Description:**
Annelida (Polychaeta), Echinodermata (Echinodermata), Mollusca (Scaphopoda)

# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS



**Station:** ECR_ENV_37
**Fix:** 103 **E:** 526634 **N:** 6399272 **Depth (m):** 75

**Sediment Description:**
Soft sediment with burrows

**Faunal Description:**
Animalia tube



**Station:** ECR_ENV_37
**Fix:** 112 **E:** 526620 **N:** 6399288 **Depth (m):** 75

**Sediment Description:**
Soft sediment

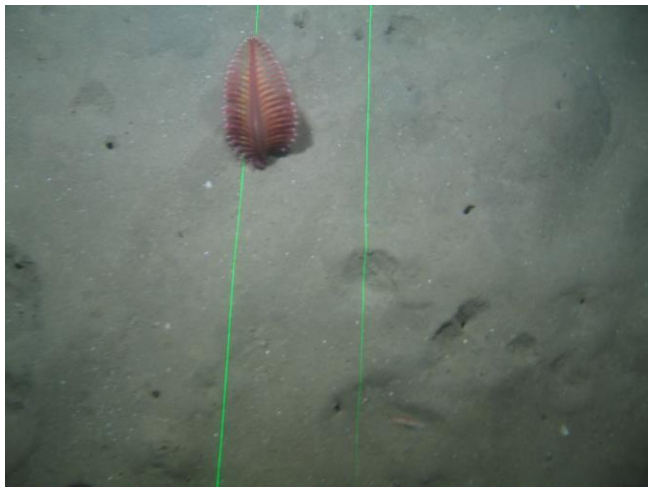
**Faunal Description:**
Animalia tube, Foraminifera



**Station:** ECR_ENV_37
**Fix:** 114 **E:** 526618 **N:** 6399292 **Depth (m):** 75

**Sediment Description:**
Soft sediment with burrow

**Faunal Description:**
Animalia tube, Cnidaria (Pennatuloidea *stet.*)

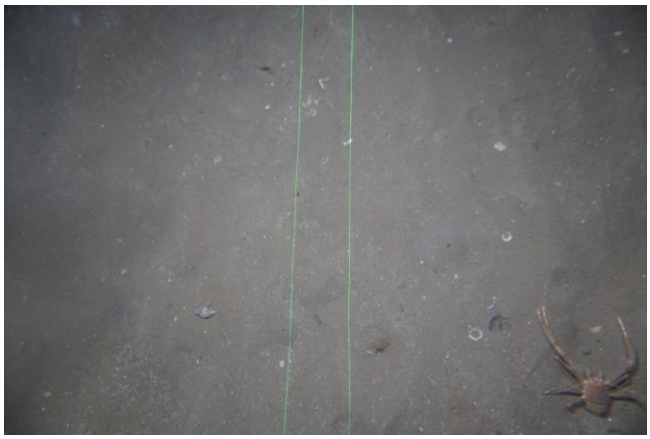


**Station:** ECR_ENV_37
**Fix:** 123 **E:** 526601 **N:** 6399309 **Depth (m):** 75

**Sediment Description:**
Soft sediment with burrows

**Faunal Description:**
Cnidaria (Pennatuloidea *stet.*)

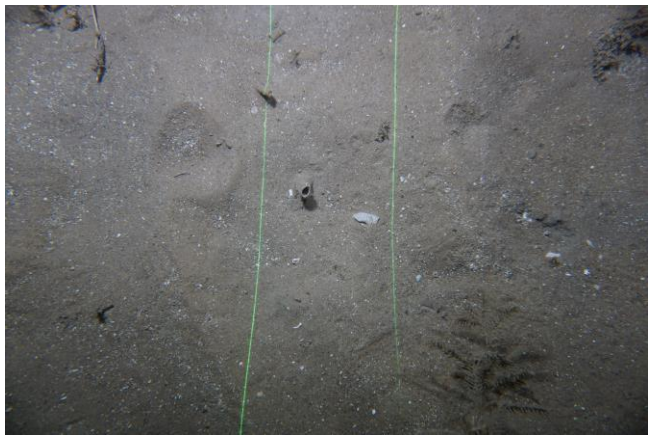
# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS



**Station:** ECR_ENV_38
**Fix:** 51 **E:** 523694 **N:** 6398976 **Depth (m):** 60

**Sediment Description:**
Sand with some shell fragments

**Faunal Description:**
Arthropoda (Galatheoidea *stet.*)



**Station:** ECR_ENV_38
**Fix:** 60 **E:** 523684 **N:** 6398986 **Depth (m):** 60

**Sediment Description:**
Soft sediment

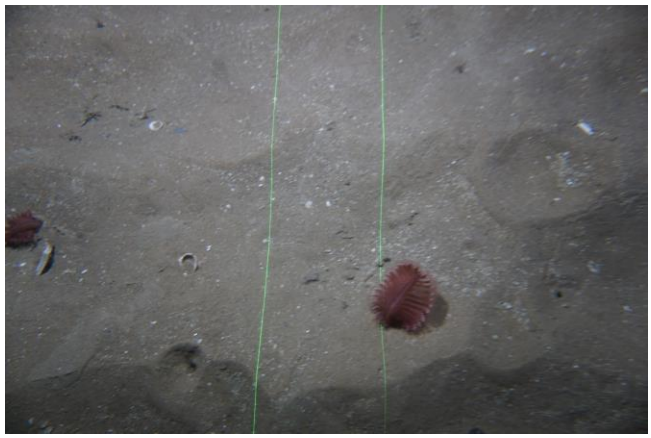
**Faunal Description:**
Animalia tube, Cnidaria (Sertulariidae *indet.* 001), Faunal turf



**Station:** ECR_ENV_38
**Fix:** 71 **E:** 523659 **N:** 6398995 **Depth (m):** 60

**Sediment Description:**
Soft sediment

**Faunal Description:**
Cnidaria (Pennatuloidea *stet.*)

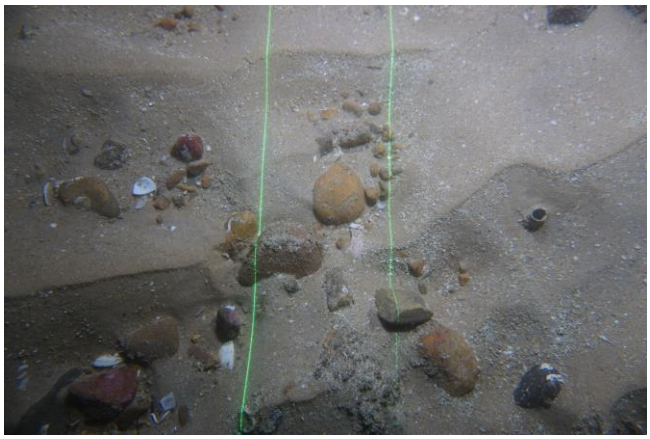


**Station:** ECR_ENV_38
**Fix:** 79 **E:** 523644 **N:** 6399005 **Depth (m):** 60

**Sediment Description:**
Soft sediment

**Faunal Description:**
Animalia tube, Cnidaria (Pennatuloidea *stet.*)

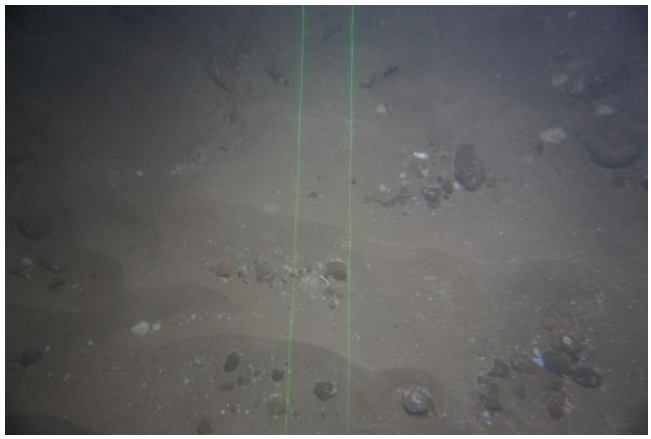
# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS



**Station:** ECR_ENV_39
**Fix:** 12 **E:** 523602 **N:** 6396253 **Depth (m):** 39

**Sediment Description:**
Soft sediment with cobbles.

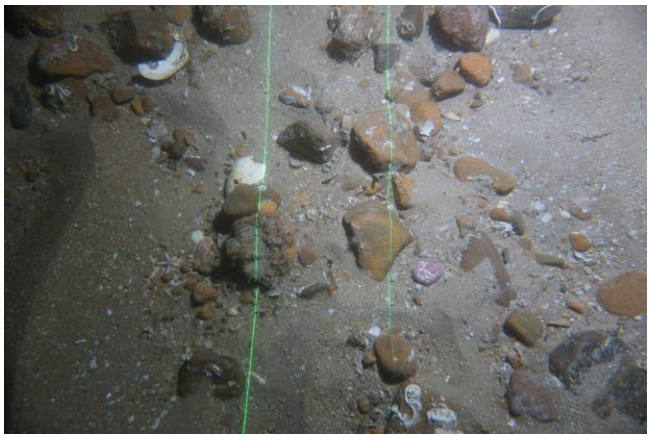
**Faunal Description:**
Animalia tube, Annelida (Serpulidae *stet.*), Epifauna, Porifera *indet.* 001



**Station:** ECR_ENV_39
**Fix:** 19 **E:** 523595 **N:** 6396267 **Depth (m):** 40

**Sediment Description:**
Soft sediment with some gravel

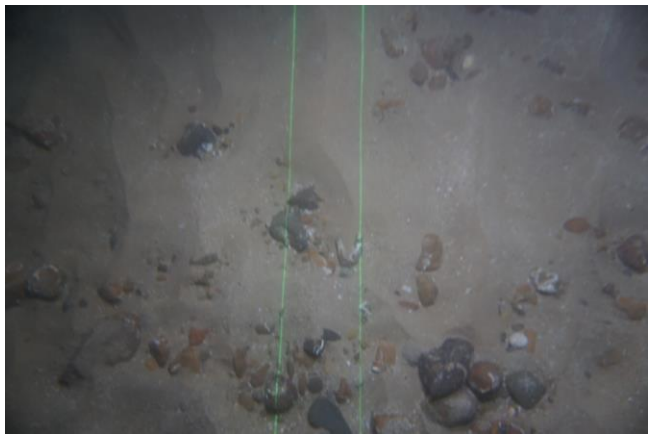
**Faunal Description:**
Annelida (Serpulidae *stet.*), Echinodermata (Asteroidea *indet.* 001), Epifauna



**Station:** ECR_ENV_39
**Fix:** 45 **E:** 523550 **N:** 6396320 **Depth (m):** 40

**Sediment Description:**
Scattered cobbles on soft sediment

**Faunal Description:**
Annelida (Serpulidae *stet.*), Echinodermata (*Asterias rubens*), Epifauna, Faunal turf, Porifera *indet.* 001

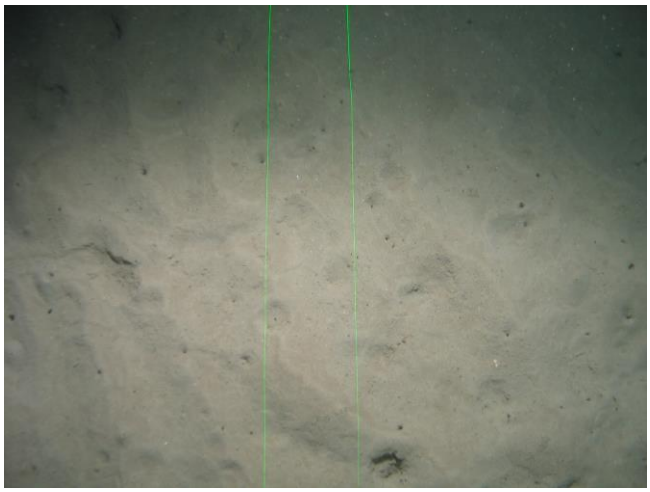


**Station:** ECR_ENV_39
**Fix:** 6 **E:** 523615 **N:** 6396243 **Depth (m):** 39

**Sediment Description:**
Soft sediment with a few cobbles

**Faunal Description:**
Annelida (Serpulidae *stet.*), Epifauna

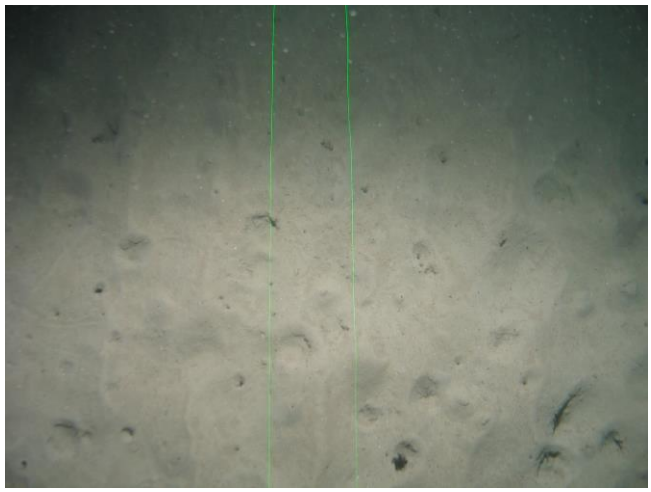
# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS



**Station:** ECR_ENV_40
**Fix:** 644 **E:** 527644 **N:** 6437704 **Depth (m):** 69

**Sediment Description:**
Soft sediment

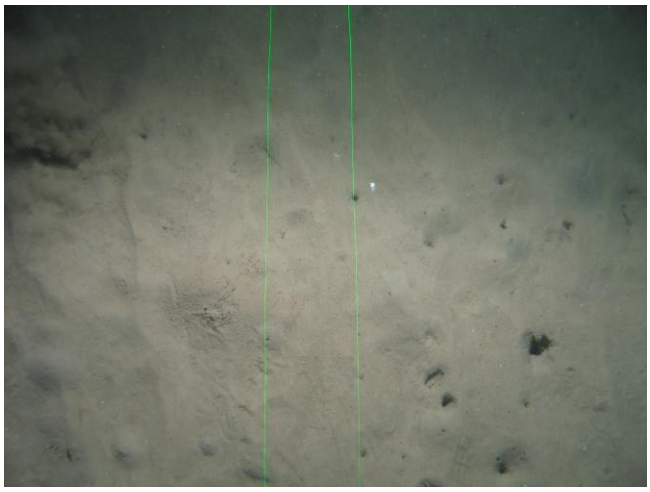
**Faunal Description:**
Animalia tube



**Station:** ECR_ENV_40
**Fix:** 651 **E:** 527664 **N:** 6437704 **Depth (m):** 69

**Sediment Description:**
Soft sediment

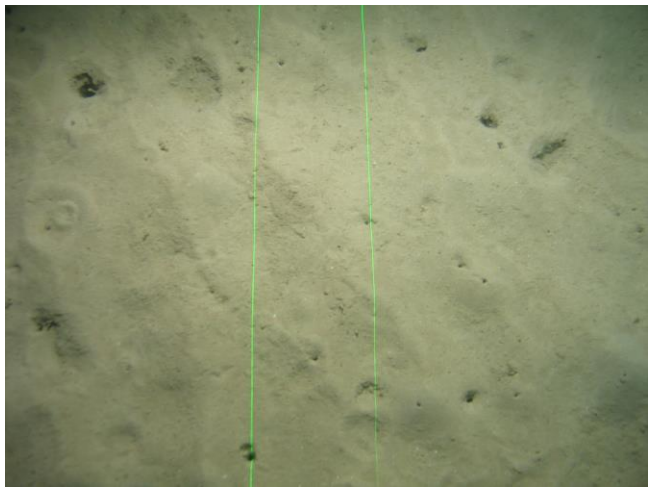
**Faunal Description:**
Animalia tube



**Station:** ECR_ENV_40
**Fix:** 657 **E:** 527685 **N:** 6437698 **Depth (m):** 70

**Sediment Description:**
Soft sediment

**Faunal Description:**
No visible fauna

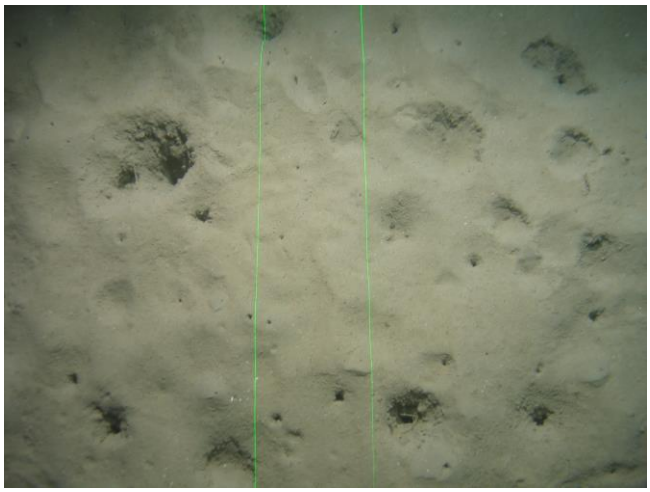


**Station:** ECR_ENV_40
**Fix:** 666 **E:** 527703 **N:** 6437683 **Depth (m):** 70

**Sediment Description:**
Soft sediment

**Faunal Description:**
No visible fauna

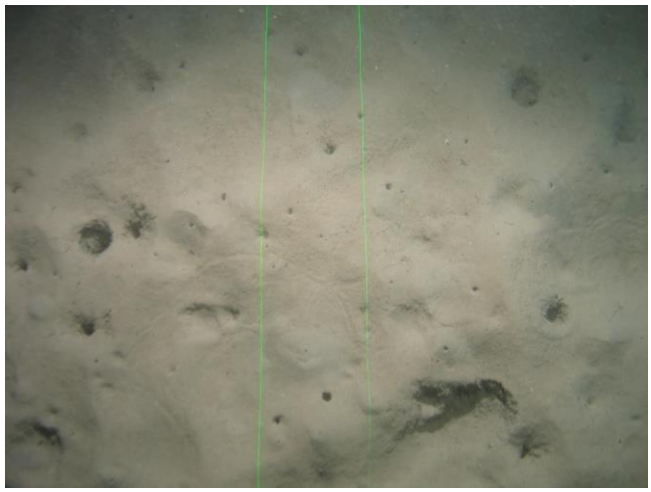
# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS



**Station:** ECR_ENV_41
**Fix:** 603 **E:** 529552 **N:** 6430644 **Depth (m):** 74

**Sediment Description:**
Soft sediment with burrows

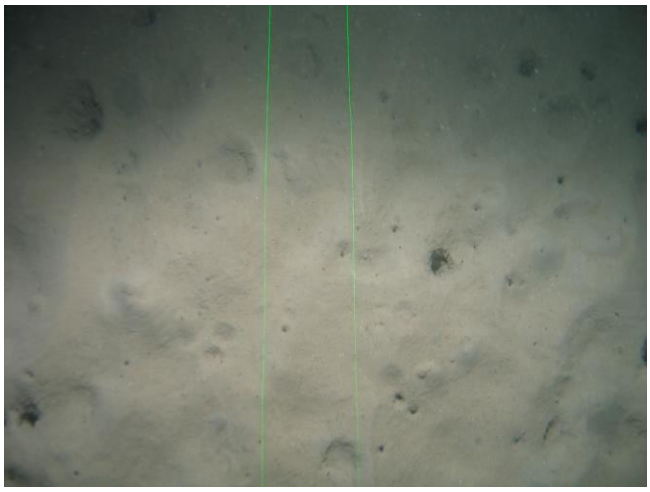
**Faunal Description:**
No visible fauna



**Station:** ECR_ENV_41
**Fix:** 609 **E:** 529558 **N:** 6430649 **Depth (m):** 74

**Sediment Description:**
Soft sediment with bioturbation and faunal tracks

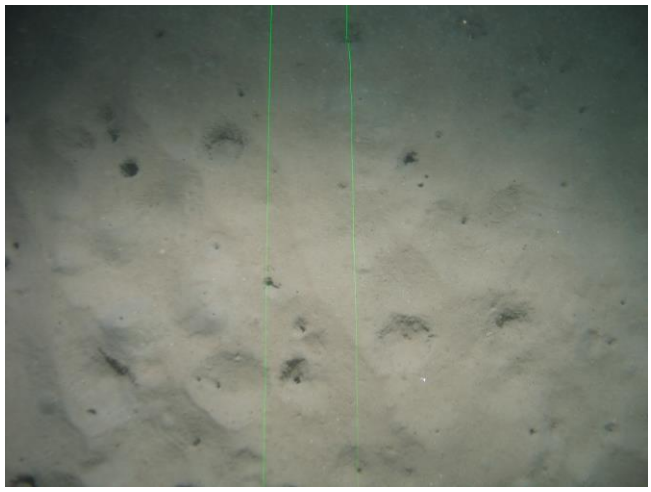
**Faunal Description:**
No visible fauna



**Station:** ECR_ENV_41
**Fix:** 626 **E:** 529594 **N:** 6430651 **Depth (m):** 74

**Sediment Description:**
Soft sediment with bioturbation

**Faunal Description:**
No visible fauna

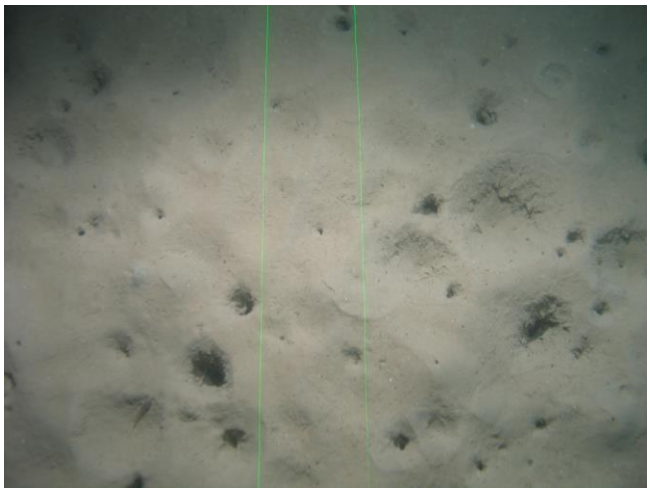


**Station:** ECR_ENV_41
**Fix:** 634 **E:** 529618 **N:** 6430652 **Depth (m):** 74

**Sediment Description:**
Soft sediment with bioturbation

**Faunal Description:**
No visible fauna

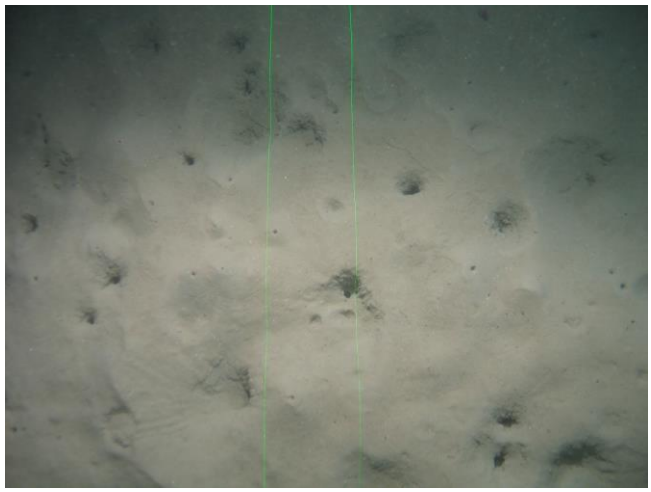
# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS



**Station:** ECR_ENV_42
**Fix:** 568 **E:** 526521 **N:** 6425776 **Depth (m):** 78

**Sediment Description:**
Soft sediment with bioturbation

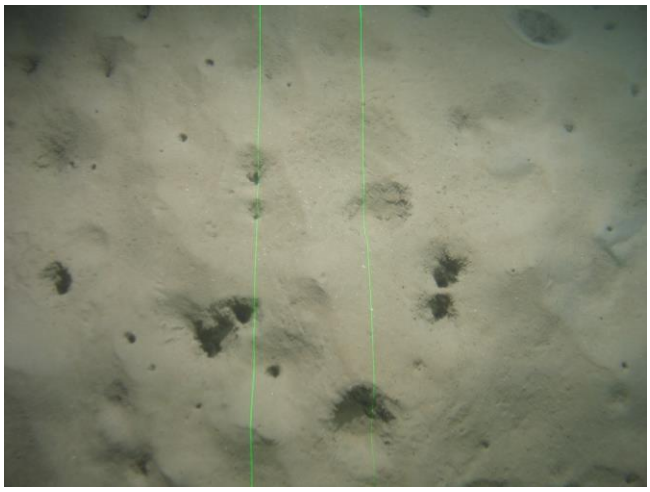
**Faunal Description:**
Animalia tube, Chordata (Actinopterygii *indet.* GL0001)



**Station:** ECR_ENV_42
**Fix:** 573 **E:** 526537 **N:** 6425775 **Depth (m):** 78

**Sediment Description:**
Soft sediment with bioturbation

**Faunal Description:**
No visible fauna



**Station:** ECR_ENV_42
**Fix:** 587 **E:** 526575 **N:** 6425778 **Depth (m):** 78

**Sediment Description:**
Soft sediment with bioturbation

**Faunal Description:**
No visible fauna

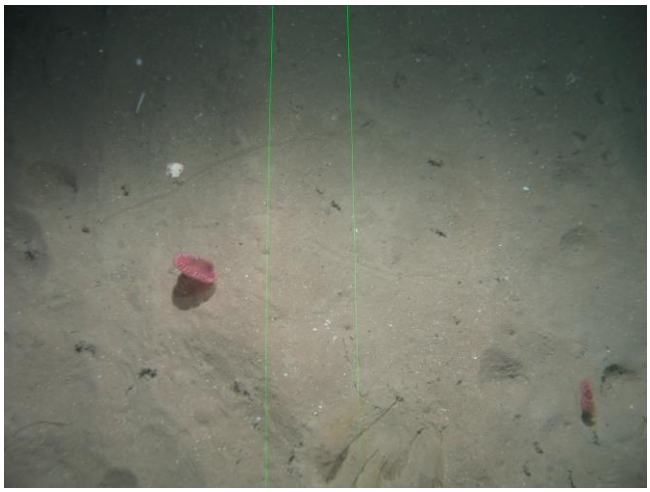


**Station:** ECR_ENV_42
**Fix:** 594 **E:** 526588 **N:** 6425777 **Depth (m):** 78

**Sediment Description:**
Soft sediment with bioturbation

**Faunal Description:**
Cnidaria (Pennatuloidea *stet.*)

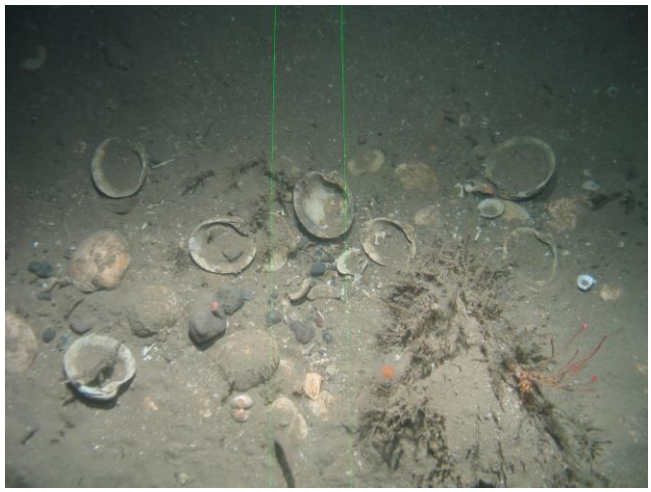
# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS



**Station:** ECR_ENV_43
**Fix:** 502 **E:** 526885 **N:** 6417296 **Depth (m):** 64

**Sediment Description:**
Soft sediment with shell fragments and faunal tracks

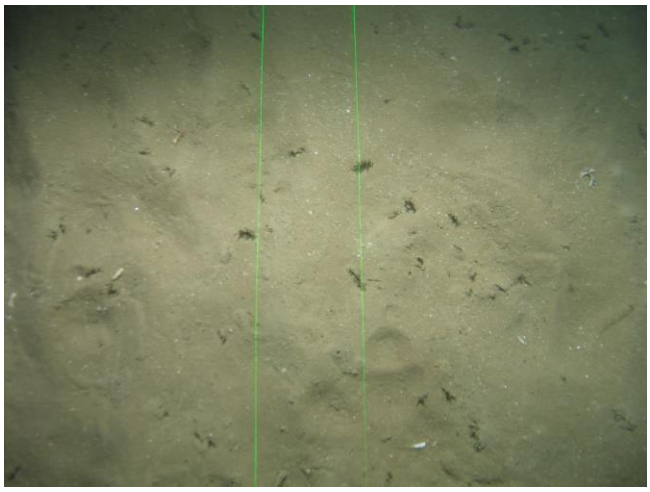
**Faunal Description:**
Cnidaria (*Lytocarpia myriophyllum*, Pennatuloidea *stet.*)



**Station:** ECR_ENV_43
**Fix:** 516 **E:** 526913 **N:** 6417292 **Depth (m):** 64

**Sediment Description:**
Soft sediment with cobbles and shell fragments

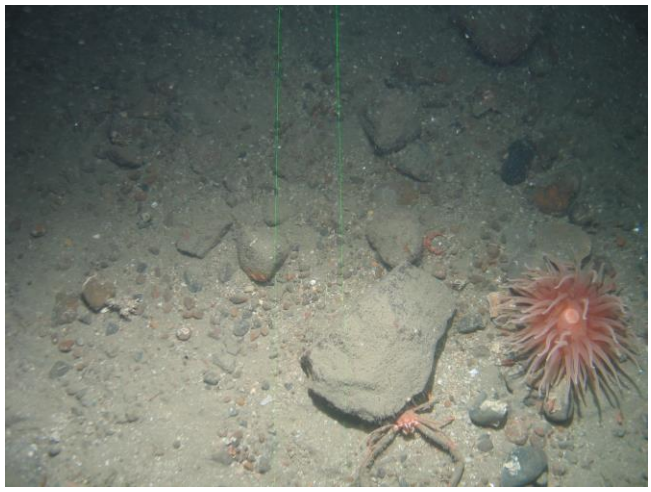
**Faunal Description:**
Arthropoda (Paguroidea *stet.*), Cnidaria (*Alcyonium digitatum*, *Tubularia indivisa*), Epifauna, Faunal turf



**Station:** ECR_ENV_43
**Fix:** 522 **E:** 526926 **N:** 6417294 **Depth (m):** 64

**Sediment Description:**
Soft rippled sediment

**Faunal Description:**
No visible fauna

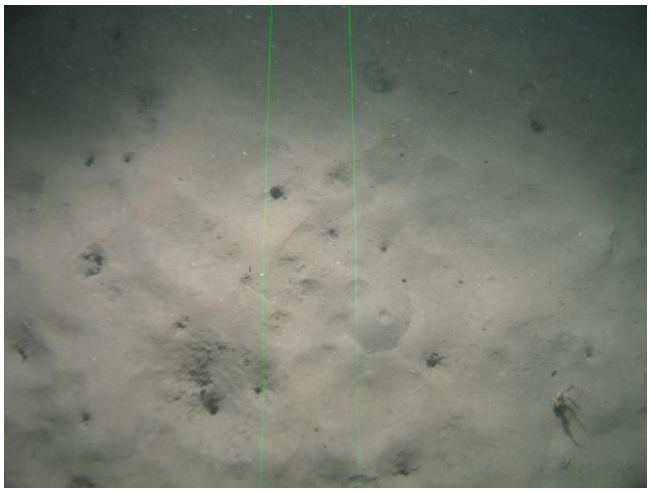


**Station:** ECR_ENV_43
**Fix:** 548 **E:** 526972 **N:** 6417295 **Depth (m):** 64

**Sediment Description:**
Scattered cobbles on top of soft sediment

**Faunal Description:**
Annelida (Serpulidae *stet.*), Arthropoda (Galatheoidea *stet.*), Cnidaria (*Bolocera tuediae*), Epifauna

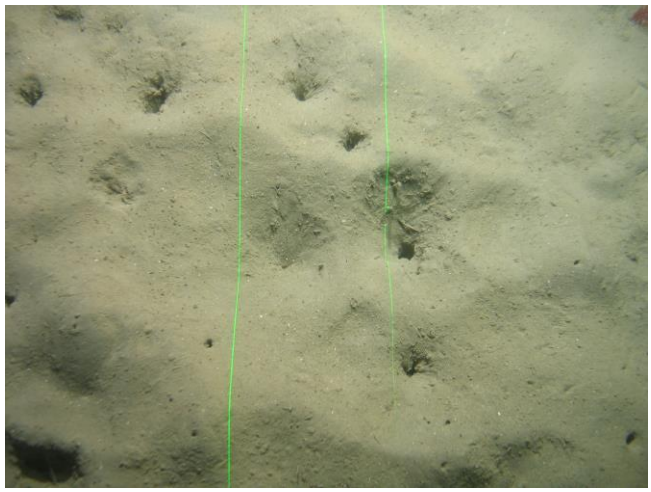
# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS



**Station:** ECR_ENV_44
**Fix:** 464 **E:** 525537 **N:** 6411511 **Depth (m):** 77

**Sediment Description:**
Soft sediment with bioturbation

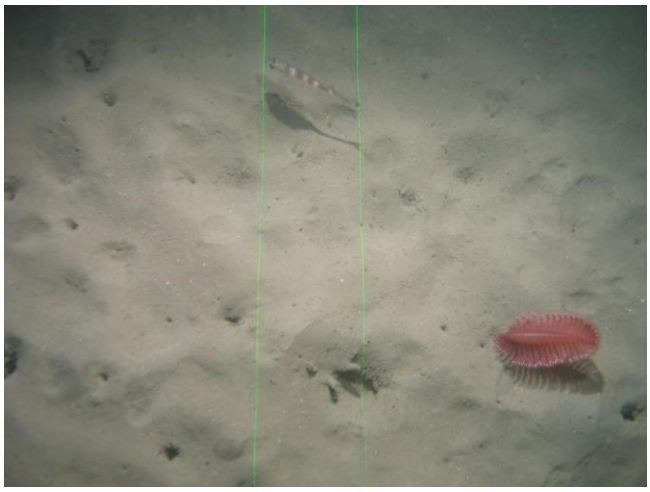
**Faunal Description:**
Cnidaria (*Tubularia indivisa*)



**Station:** ECR_ENV_44
**Fix:** 471 **E:** 525552 **N:** 6411507 **Depth (m):** 77

**Sediment Description:**
Soft sediment with bioturbation and faunal tracks

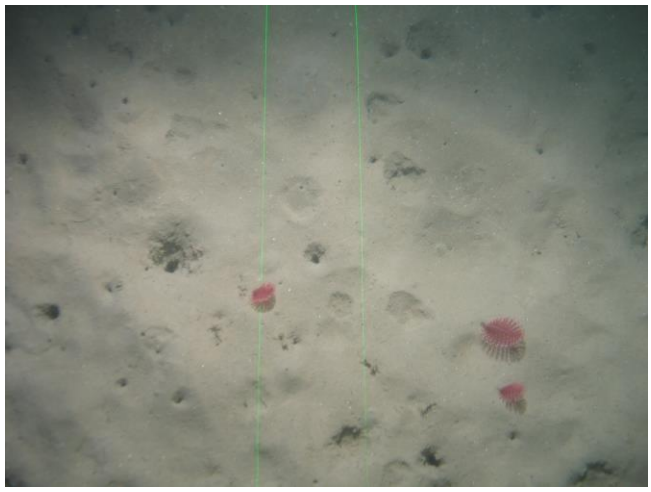
**Faunal Description:**
Cnidaria (Pennatuloidea *stet.*)



**Station:** ECR_ENV_44
**Fix:** 478 **E:** 525572 **N:** 6411511 **Depth (m):** 77

**Sediment Description:**
Soft sediment with bioturbation

**Faunal Description:**
Chordata (Actinopterygii *indet.* 001), Cnidaria (Pennatuloidea *stet.*)

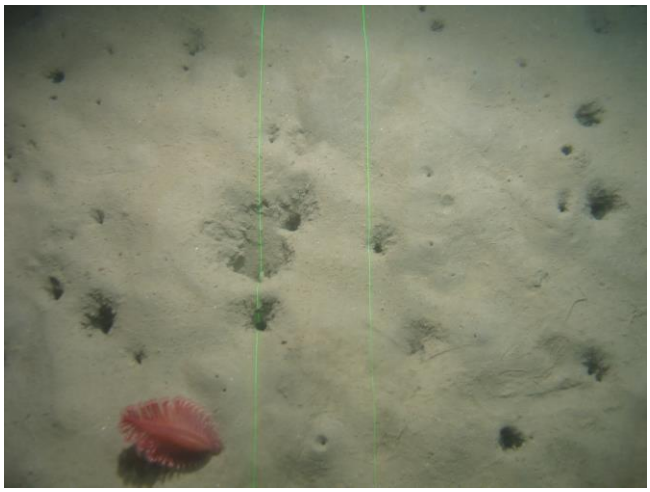


**Station:** ECR_ENV_44
**Fix:** 488 **E:** 525608 **N:** 6411513 **Depth (m):** 77

**Sediment Description:**
Soft sediment with bioturbation

**Faunal Description:**
Cnidaria (Pennatuloidea *stet.*)

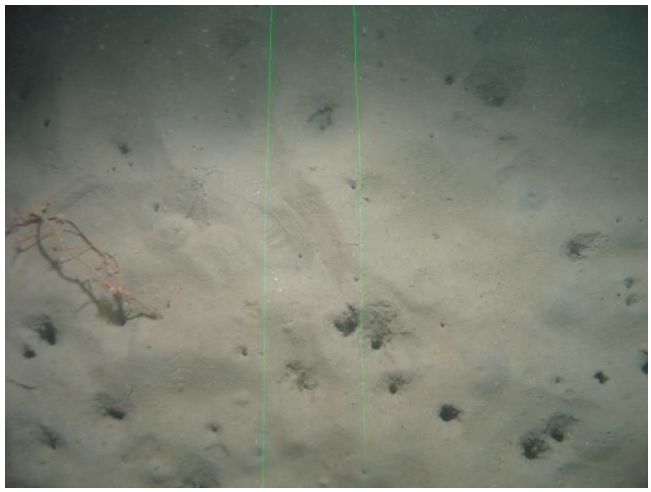
# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS



**Station:** ECR_ENV_45
**Fix:** 437 **E:** 527510 **N:** 6410068 **Depth (m):** 83

**Sediment Description:**
Soft sediment with bioturbation

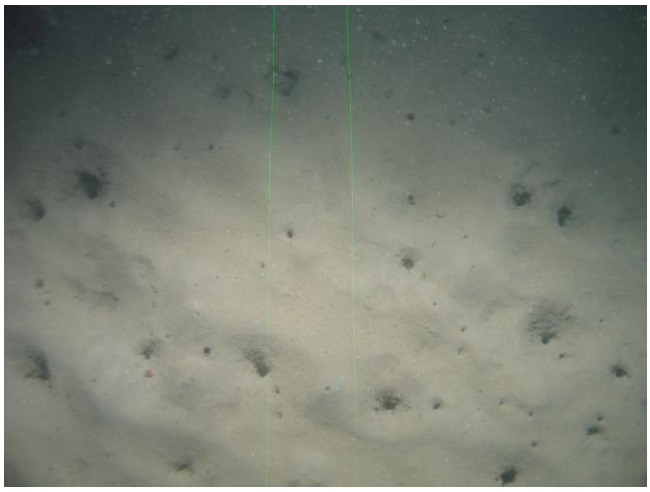
**Faunal Description:**
Cnidaria (Pennatuloidea *stet.*)



**Station:** ECR_ENV_45
**Fix:** 445 **E:** 527542 **N:** 6410066 **Depth (m):** 83

**Sediment Description:**
Soft sediment with bioturbation and faunal tracks

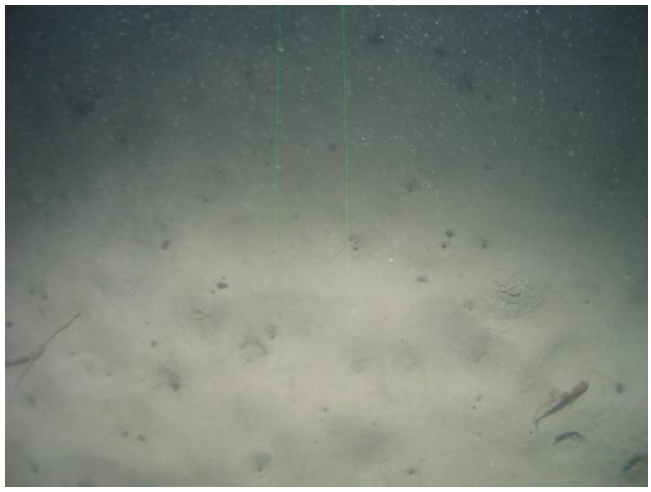
**Faunal Description:**
Cnidaria (*Tubularia indivisa*)



**Station:** ECR_ENV_45
**Fix:** 451 **E:** 527560 **N:** 6410065 **Depth (m):** 83

**Sediment Description:**
Soft sediment with bioturbation

**Faunal Description:**
Animalia tube, Cnidaria (Pennatuloidea *stet.*)

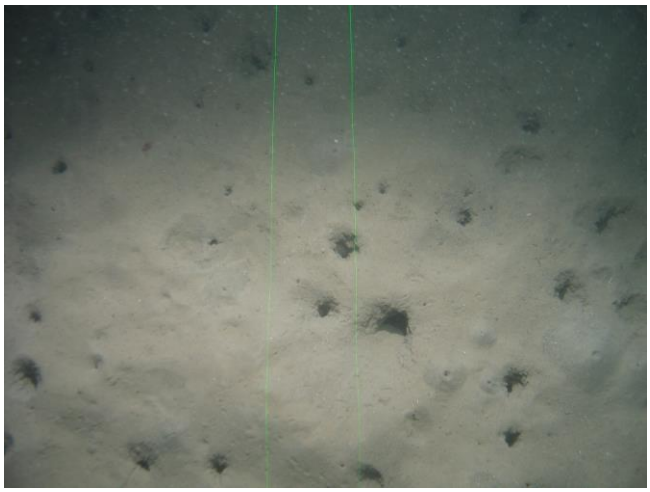


**Station:** ECR_ENV_45
**Fix:** 456 **E:** 527566 **N:** 6410062 **Depth (m):** 83

**Sediment Description:**
Soft sediment with bioturbation

**Faunal Description:**
Chordata (Actinopterygii *indet.* 001)

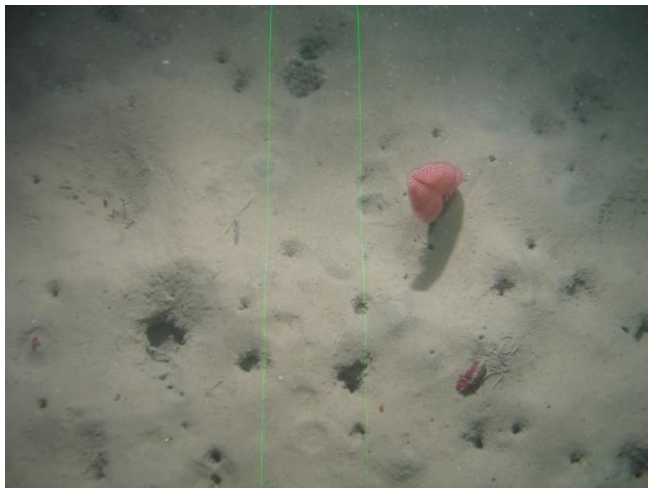
# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS



**Station:** ECR_ENV_46
**Fix:** 377 **E:** 524767 **N:** 6408972 **Depth (m):** 86

**Sediment Description:**
Soft sediment with bioturbation

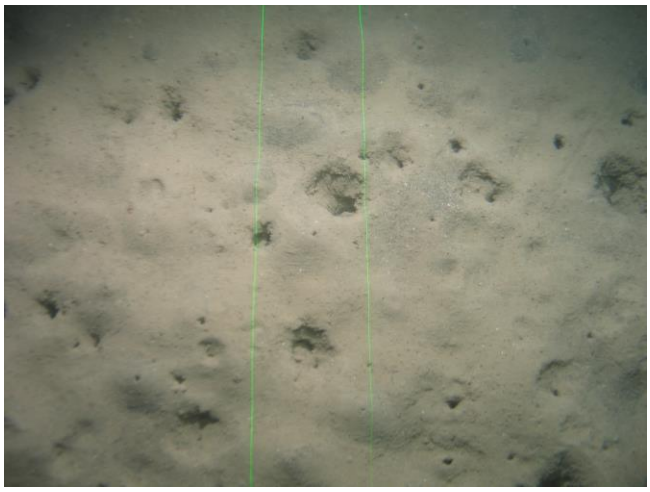
**Faunal Description:**
No visible fauna



**Station:** ECR_ENV_46
**Fix:** 384 **E:** 524778 **N:** 6408962 **Depth (m):** 86

**Sediment Description:**
Soft sediment with bioturbation

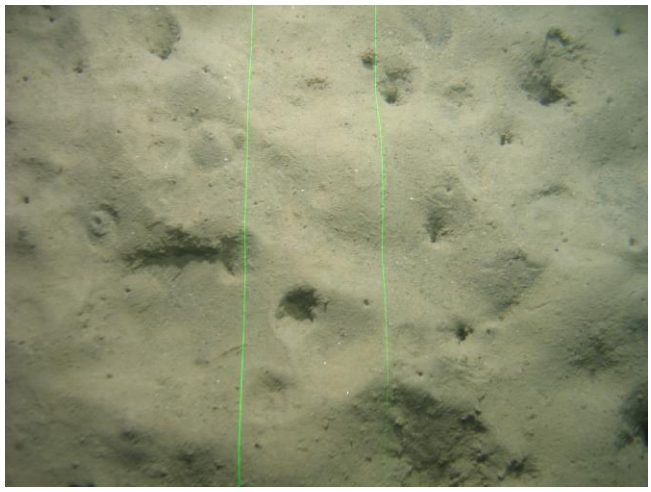
**Faunal Description:**
Cnidaria (Pennatuloidea *stet.*)



**Station:** ECR_ENV_46
**Fix:** 402 **E:** 524823 **N:** 6408954 **Depth (m):** 86

**Sediment Description:**
Soft sediment with bioturbation

**Faunal Description:**
No visible fauna

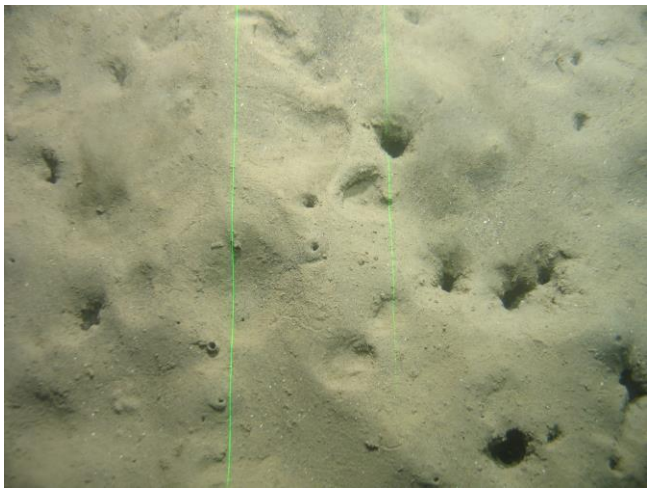


**Station:** ECR_ENV_46
**Fix:** 409 **E:** 524845 **N:** 6408957 **Depth (m):** 86

**Sediment Description:**
Soft sediment

**Faunal Description:**
No visible fauna

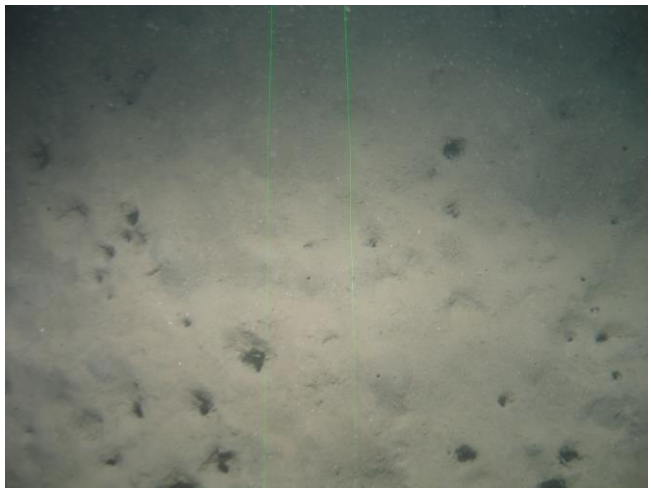
# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS



**Station:** ECR_ENV_47
**Fix:** 349 **E:** 525219 **N:** 6406976 **Depth (m):** 87

**Sediment Description:**
Soft sediment with bioturbation

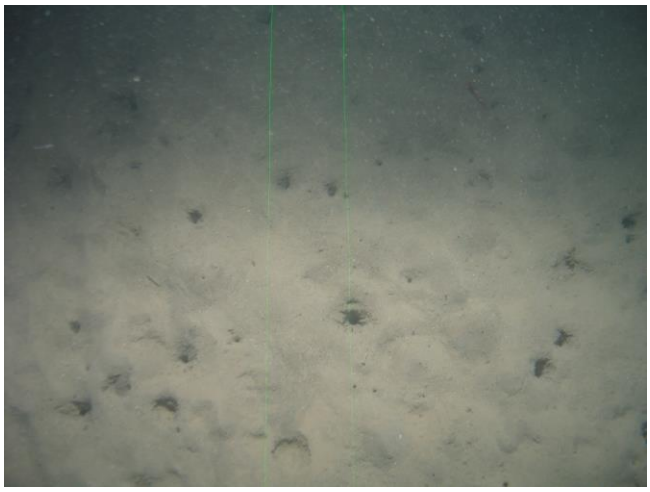
**Faunal Description:**
Animalia tube



**Station:** ECR_ENV_47
**Fix:** 361 **E:** 525210 **N:** 6406929 **Depth (m):** 85

**Sediment Description:**
Soft sediment with bioturbation

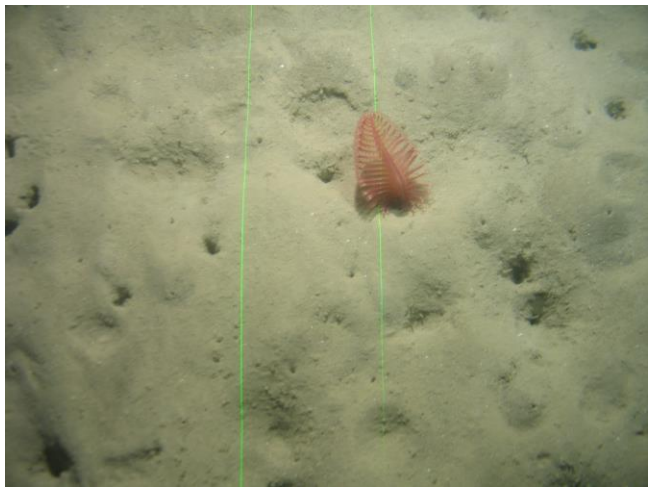
**Faunal Description:**
Cnidaria (Pennatuloidea *stet.*)



**Station:** ECR_ENV_47
**Fix:** 372 **E:** 525218 **N:** 6406906 **Depth (m):** 85

**Sediment Description:**
Soft sediment with some bioturbation

**Faunal Description:**
Animalia tube, Arthropoda (Caridea *stet.*)

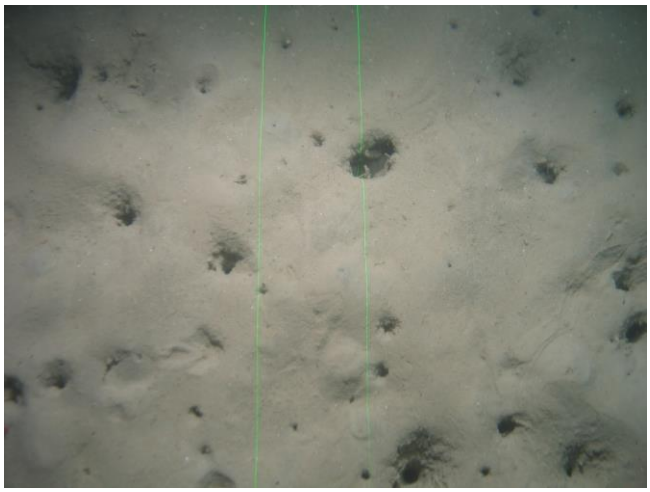


**Station:** ECR_ENV_47
**Fix:** 374 **E:** 525218 **N:** 6406904 **Depth (m):** 85

**Sediment Description:**
Soft sediment with some bioturbation

**Faunal Description:**
Cnidaria (Pennatuloidea *stet.*)

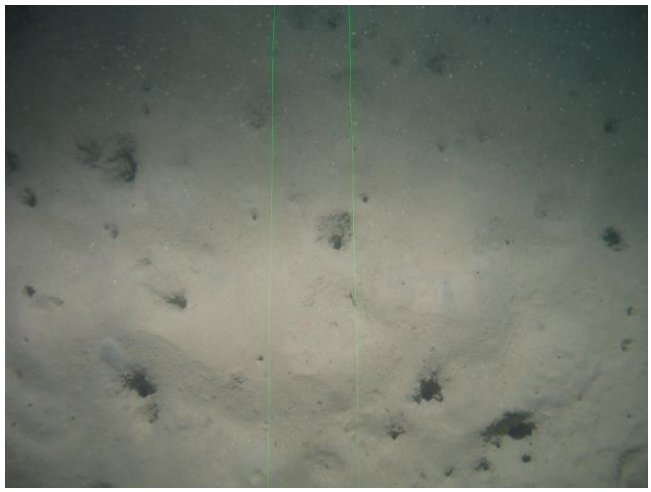
# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS



**Station:** ECR_ENV_48
**Fix:** 306 **E:** 528434 **N:** 6406992 **Depth (m):** 96

**Sediment Description:**
Soft sediment with bioturbation and faunal tracks

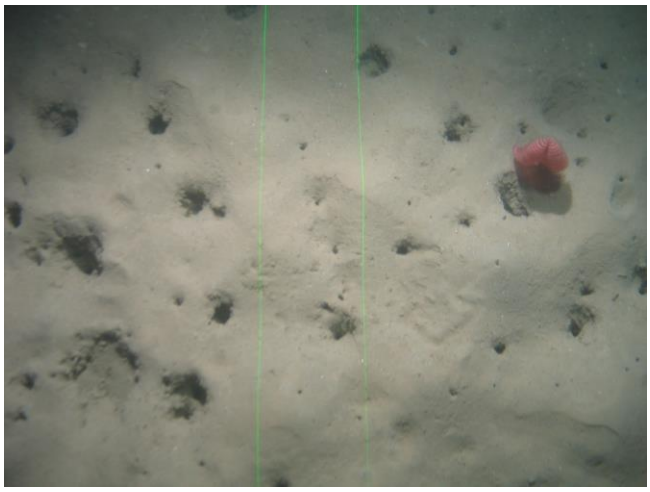
**Faunal Description:**
Animalia tube



**Station:** ECR_ENV_48
**Fix:** 317 **E:** 528402 **N:** 6406984 **Depth (m):** 95

**Sediment Description:**
Soft sediment with bioturbation

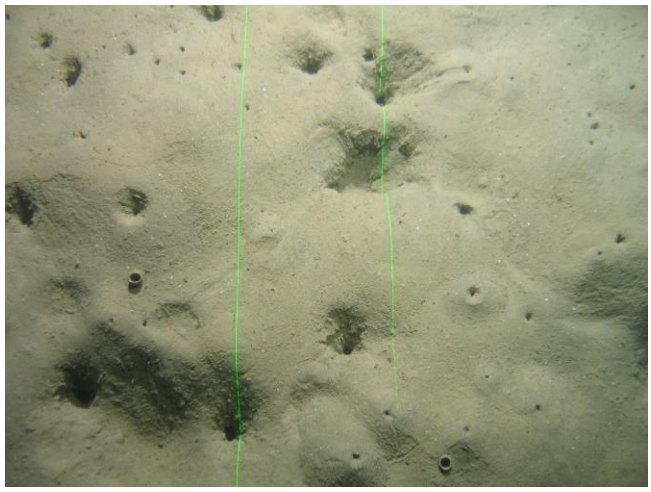
**Faunal Description:**
Animalia tube



**Station:** ECR_ENV_48
**Fix:** 320 **E:** 528396 **N:** 6406983 **Depth (m):** 96

**Sediment Description:**
Soft sediment with bioturbation

**Faunal Description:**
Cnidaria (Pennatuloidea *stet.*)

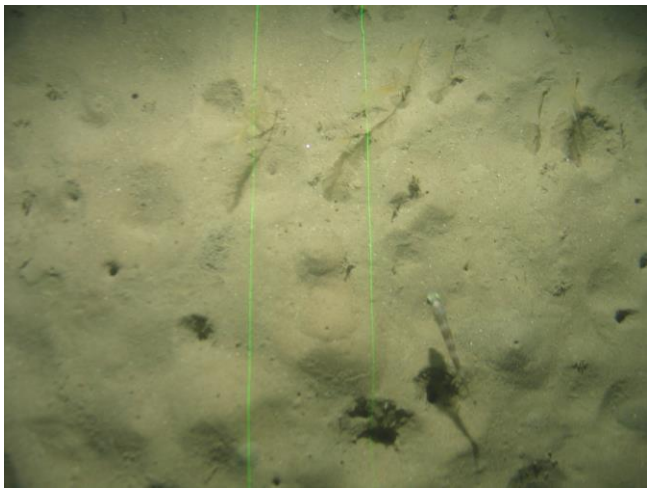


**Station:** ECR_ENV_48
**Fix:** 331 **E:** 528365 **N:** 6406982 **Depth (m):** 95

**Sediment Description:**
Soft sediment with bioturbation

**Faunal Description:**
Animalia tube, Echinodermata (Ophiuridae *stet.*)

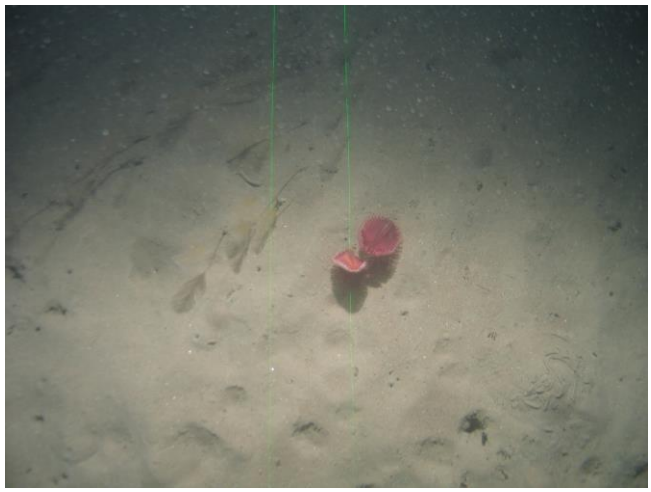
# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS



**Station:** ECR_ENV_49
**Fix:** 287 **E:** 526320 **N:** 6405006 **Depth (m):** 72

**Sediment Description:**
Soft sediment with some bioturbation

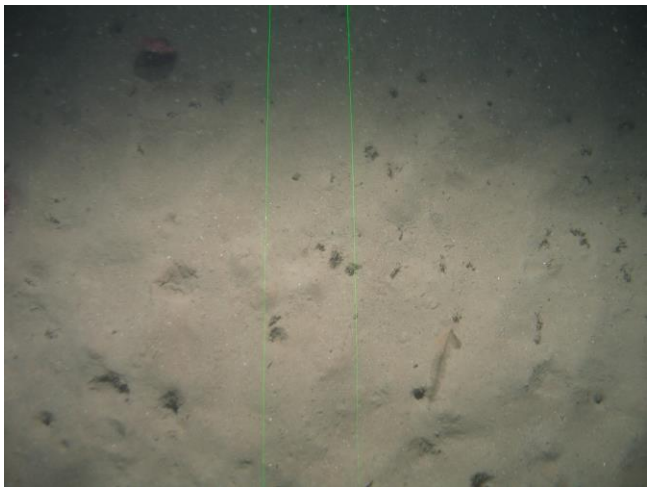
**Faunal Description:**
Chordata (Actinopterygii *indet.* 001), Cnidaria (*Lytocarpia myriophyllum*), Faunal turf



**Station:** ECR_ENV_49
**Fix:** 290 **E:** 526310 **N:** 6405001 **Depth (m):** 72

**Sediment Description:**
Soft sediment

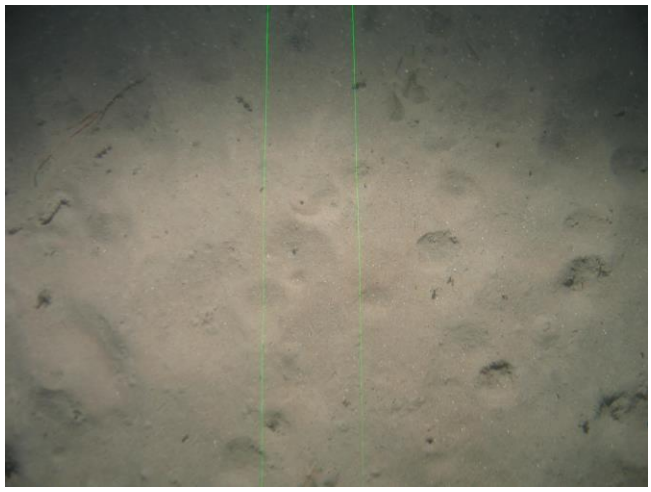
**Faunal Description:**
Animalia tube, Cnidaria (*Lytocarpia myriophyllum*, Pennatuloidea *stet.*)



**Station:** ECR_ENV_49
**Fix:** 291 **E:** 526308 **N:** 6405000 **Depth (m):** 72

**Sediment Description:**
Soft sediment

**Faunal Description:**
Animalia tube, Cnidaria (*Nemertesia antennina*, Pennatuloidea *stet.*), Faunal turf

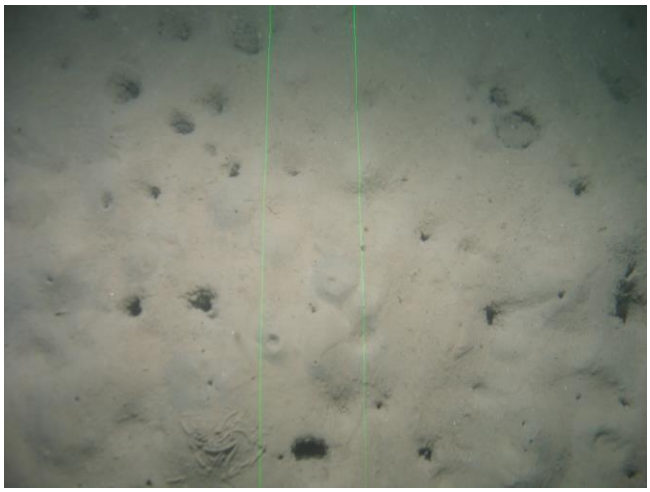


**Station:** ECR_ENV_49
**Fix:** 298 **E:** 526286 **N:** 6404996 **Depth (m):** 73

**Sediment Description:**
Soft sediment

**Faunal Description:**
Animalia tube, Cnidaria (*Tubularia indivisa*), Faunal turf

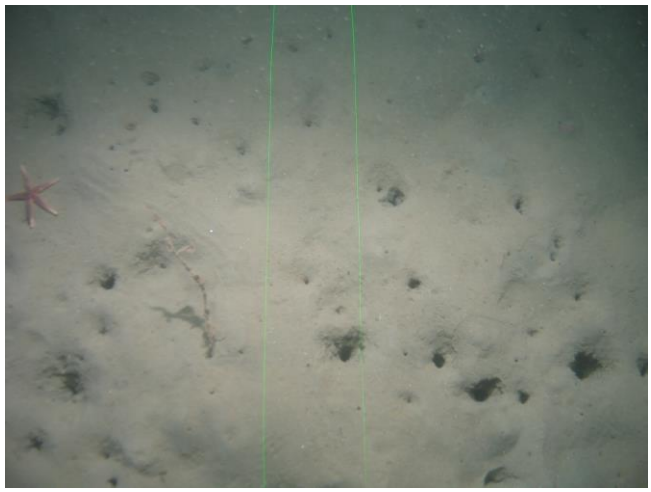
# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS



**Station:** ECR_ENV_50
**Fix:** 219 **E:** 529451 **N:** 6403678 **Depth (m):** 98

**Sediment Description:**
Soft sediment with bioturbation

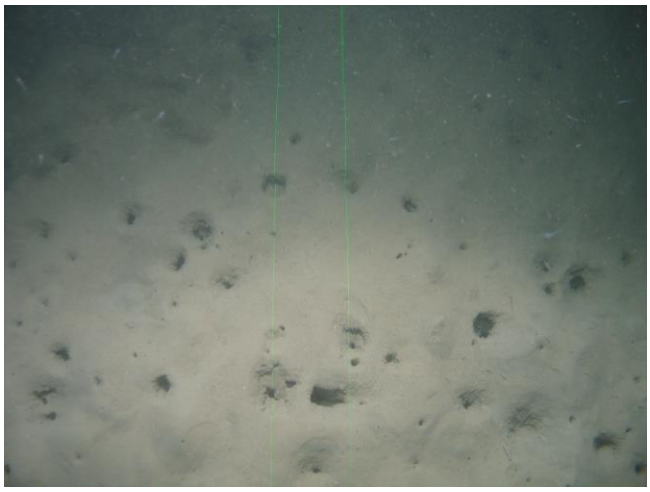
**Faunal Description:**
No visible fauna



**Station:** ECR_ENV_50
**Fix:** 235 **E:** 529496 **N:** 6403682 **Depth (m):** 98

**Sediment Description:**
Soft sediment with bioturbation and faunal tracks

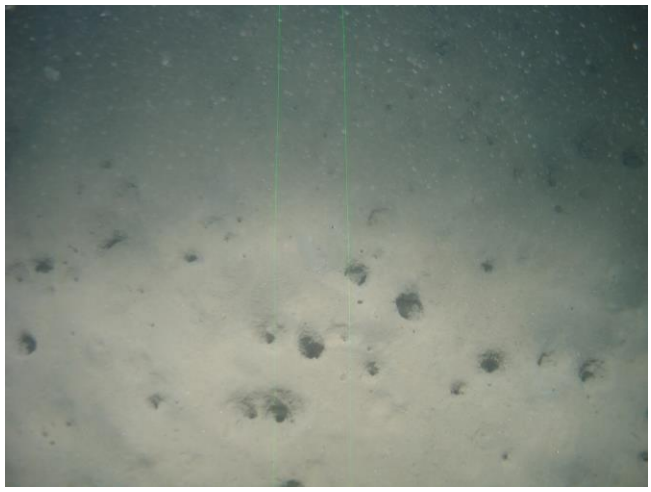
**Faunal Description:**
Animalia tube, Annelida (*Myxicola stet*), Cnidaria (*Tubularia indivisa*), Echinodermata (*Henricia stet*)



**Station:** ECR_ENV_50
**Fix:** 249 **E:** 529527 **N:** 6403685 **Depth (m):** 98

**Sediment Description:**
Soft sediment with bioturbation

**Faunal Description:**
No visible fauna

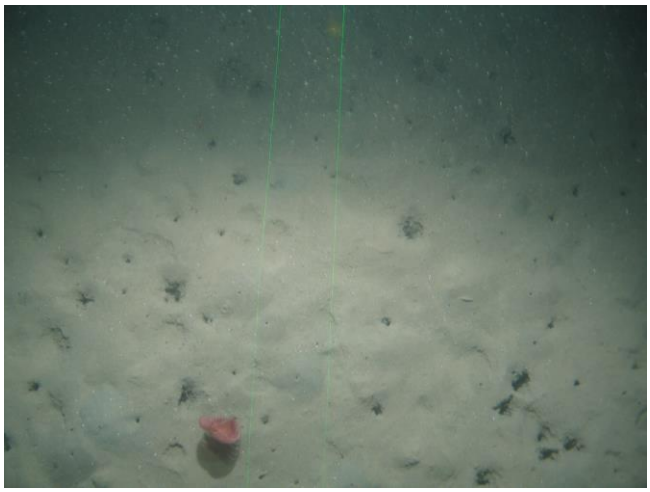


**Station:** ECR_ENV_50
**Fix:** 255 **E:** 529540 **N:** 6403686 **Depth (m):** 98

**Sediment Description:**
Soft sediment with bioturbation

**Faunal Description:**
No visible fauna

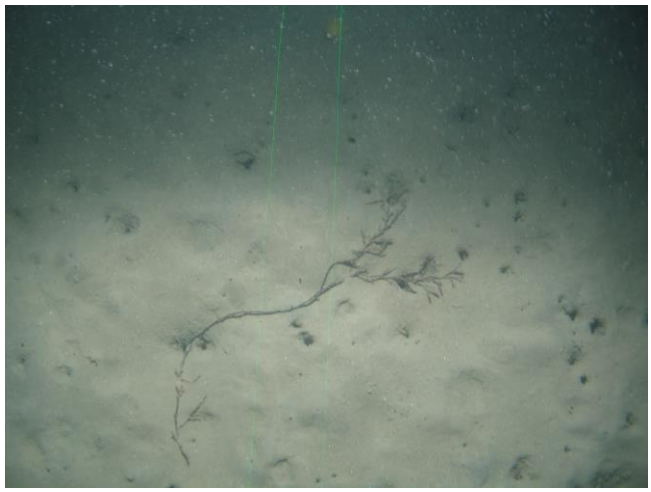
# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS



**Station:** ECR_ENV_51
**Fix:** 144 **E:** 527934 **N:** 6400649 **Depth (m):** 98

**Sediment Description:**
Soft sediment with bioturbation

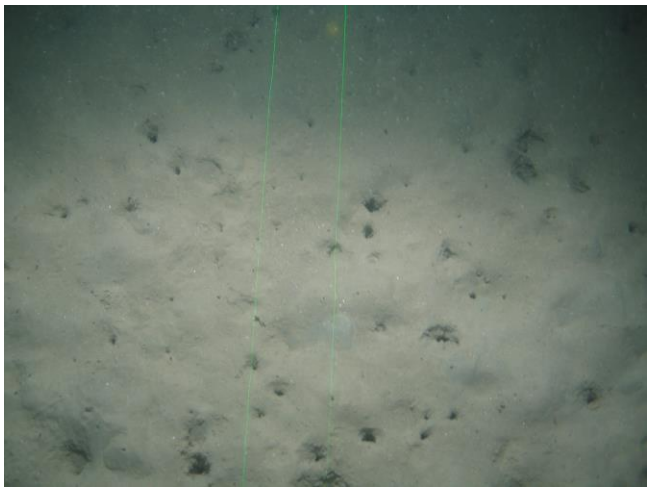
**Faunal Description:**
Animalia tube, Cnidaria (Pennatuloidea *stet.*)



**Station:** ECR_ENV_51
**Fix:** 148 **E:** 527932 **N:** 6400659 **Depth (m):** 98

**Sediment Description:**
Soft sediment with some bioturbation

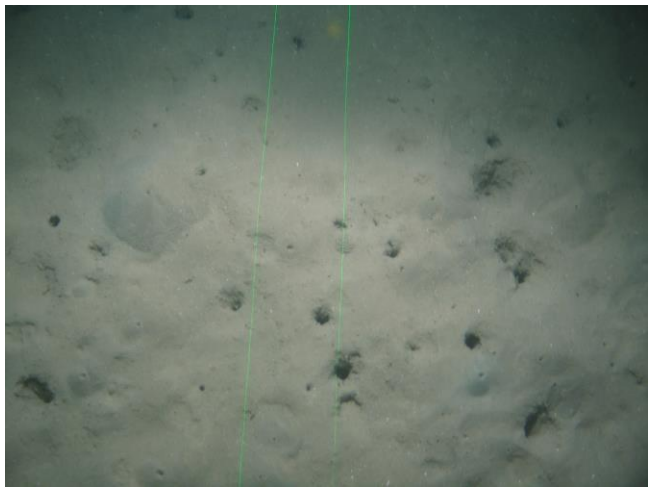
**Faunal Description:**
Animalia eggs, Animalia tube



**Station:** ECR_ENV_51
**Fix:** 156 **E:** 527928 **N:** 6400687 **Depth (m):** 98

**Sediment Description:**
Soft sediment with bioturbation

**Faunal Description:**
No visible fauna

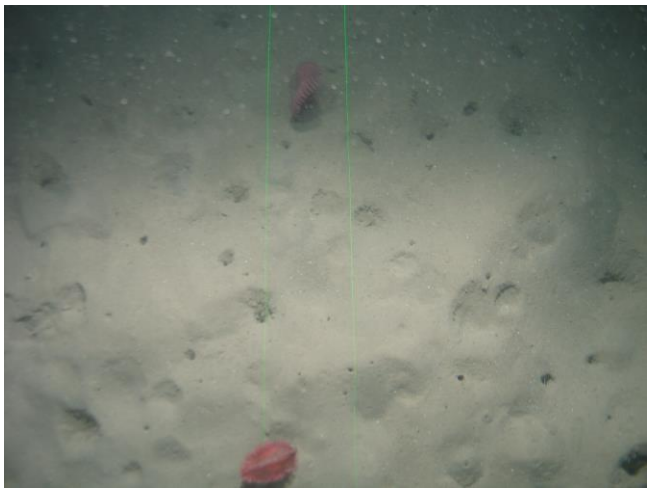


**Station:** ECR_ENV_51
**Fix:** 167 **E:** 527933 **N:** 6400718 **Depth (m):** 98

**Sediment Description:**
Soft sediment with some bioturbation

**Faunal Description:**
No visible fauna

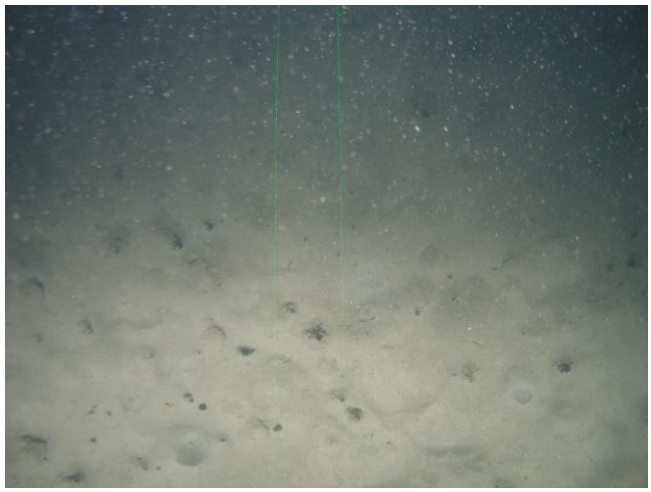
# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS



**Station:** ECR_ENV_52
**Fix:** 199 **E:** 525152 **N:** 6402565 **Depth (m):** 93

**Sediment Description:**
Soft sediment with bioturbation

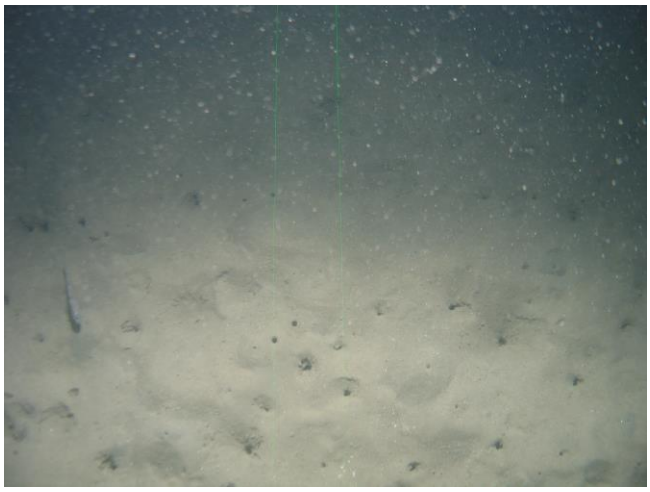
**Faunal Description:**
Animalia tube, Cnidaria (Pennatuloidea *stet.*)



**Station:** ECR_ENV_52
**Fix:** 204 **E:** 525153 **N:** 6402580 **Depth (m):** 93

**Sediment Description:**
Soft sediment with bioturbation

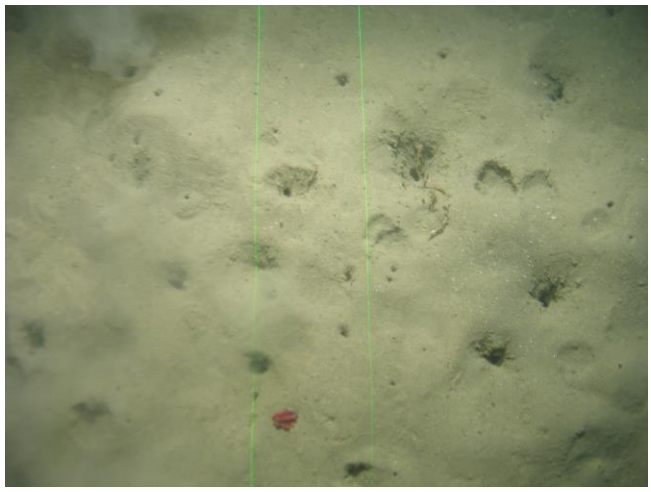
**Faunal Description:**
No visible fauna



**Station:** ECR_ENV_52
**Fix:** 205 **E:** 525152 **N:** 6402584 **Depth (m):** 93

**Sediment Description:**
Soft sediment with bioturbation

**Faunal Description:**
Animalia tube, Chordata (Actinopterygii *indet.* GL0001)



**Station:** ECR_ENV_52
**Fix:** 209 **E:** 525151 **N:** 6402604 **Depth (m):** 93

**Sediment Description:**
Soft sediment with bioturbation

**Faunal Description:**
Cnidaria (Pennatuloidea *stet.*, *Tubularia indivisa*)

# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS




**Station:** ECR_ENV_53
**Fix:** 35 **E:** 525615 **N:** 6394768 **Depth (m):** 31
**Retention:** MFA

**Sediment Description:**
Medium sand with shell fragments

**Faunal Description:**
Echinodermata (Ophiuroidea), Mollusca (Bivalvia)




**Station:** ECR_ENV_53
**Fix:** 35 **E:** 525615 **N:** 6394768 **Depth (m):** 31
**Retention:** MFA

**Sediment Description:**
Medium sand with shell fragments

**Faunal Description:**
Echinodermata (Ophiuroidea), Mollusca (Bivalvia)

# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS



**Station:** ECR_ENV_54
**Fix:** 1244 **E:** 528222 **N:** 6399817 **Depth (m):** 97

**Sediment Description:**
Soft sediment with bioturbation and faunal tracks

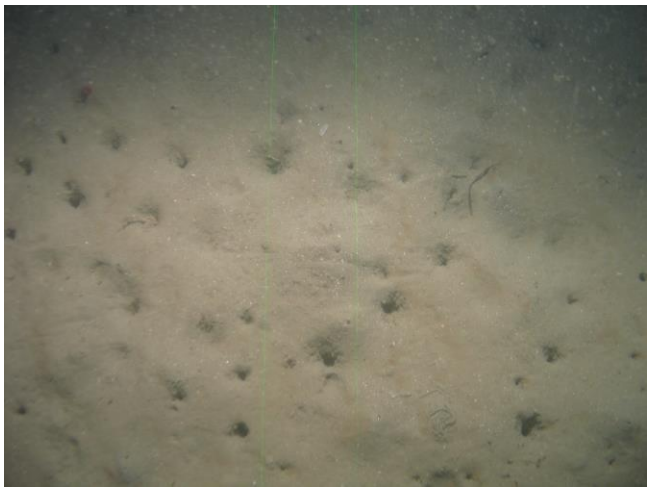
**Faunal Description:**
Arthropoda (Galatheoidea *stet.*)



**Station:** ECR_ENV_54
**Fix:** 1250 **E:** 528223 **N:** 6399815 **Depth (m):** 97

**Sediment Description:**
Soft sediment with bioturbation and faunal tracks

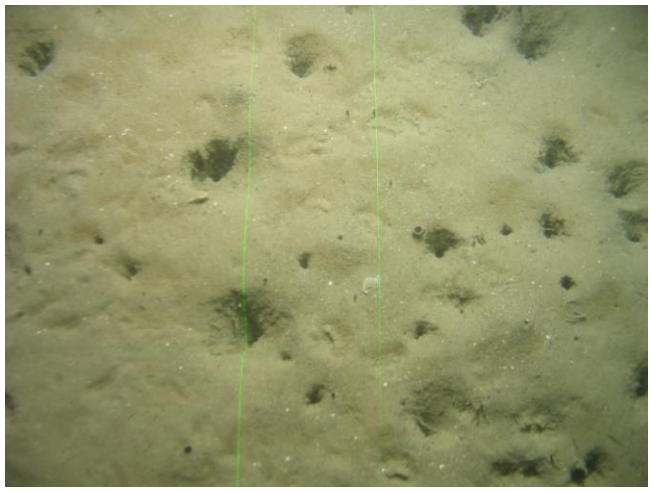
**Faunal Description:**
Animalia tube



**Station:** ECR_ENV_54
**Fix:** 1252 **E:** 528223 **N:** 6399808 **Depth (m):** 97

**Sediment Description:**
Soft sediment with bioturbation and faunal tracks

**Faunal Description:**
Cnidaria (Pennatuloidea *stet.*)



**Station:** ECR_ENV_54
**Fix:** 1268 **E:** 528223 **N:** 6399798 **Depth (m):** 96

**Sediment Description:**
Soft rippled sediment with faunal tracks

**Faunal Description:**
Animalia tube

# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS



**Station:** ECR_ENV_55
**Fix:** 1303 **E:** 526584 **N:** 6402949 **Depth (m):** 108

**Sediment Description:**
Soft sediment with bioturbation and faunal tracks

**Faunal Description:**
Arthropoda (Galatheoidea *stet.*)



**Station:** ECR_ENV_55
**Fix:** 1308 **E:** 526585 **N:** 6402944 **Depth (m):** 108

**Sediment Description:**
Soft sediment with scattered cobbles

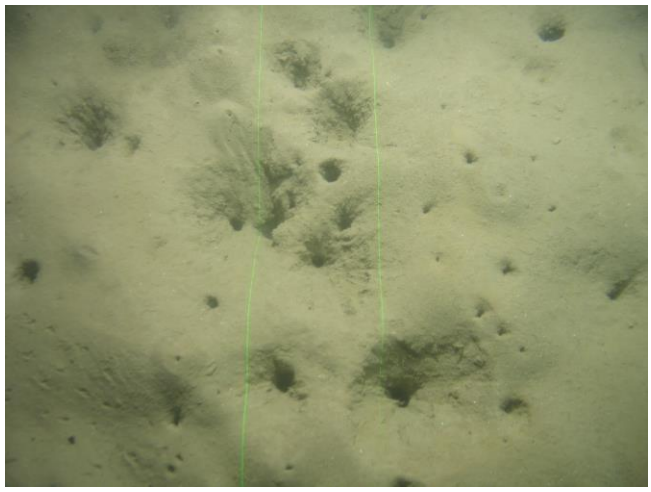
**Faunal Description:**
Arthropoda (Galatheoidea *stet.*), Chordata (Actinopterygii *indet.* GL0001), Cnidaria (Actiniaria *stet.*, *Tubularia indivisa*), Epifauna, Faunal turf



**Station:** ECR_ENV_55
**Fix:** 1314 **E:** 526583 **N:** 6402945 **Depth (m):** 108

**Sediment Description:**
Soft sediment with faunal tracks and bioturbation

**Faunal Description:**
Arthropoda (Galatheoidea *stet.*), Cnidaria (Pennatuloidea *stet.*), Epifauna, Faunal turf



**Station:** ECR_ENV_55
**Fix:** 1324 **E:** 526550 **N:** 6402913 **Depth (m):** 106

**Sediment Description:**
Soft sediment with bioturbation

**Faunal Description:**
No visible fauna

# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS



**Station:** ECR_ENV_56
**Fix:** 64 **E:** 525989 **N:** 6393619 **Depth (m):**

**Sediment Description:**
Scattered boulders

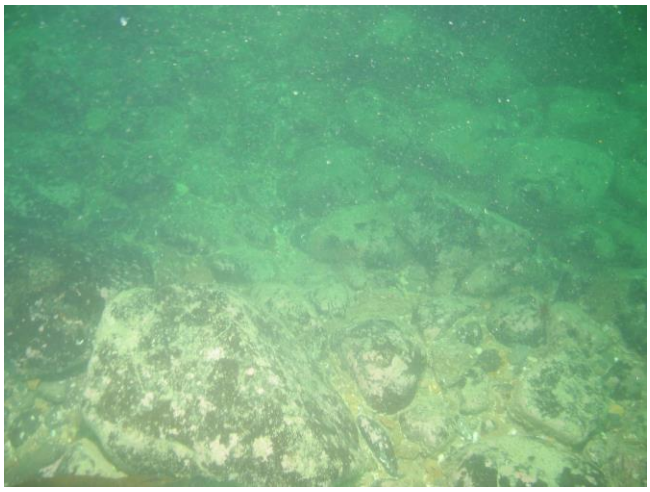
**Faunal Description:**
Echinodermata (Asteroidea ,*indet.* 001, Echinoidea *indet.* 001)



**Station:** ECR_ENV_56
**Fix:** 67 **E:** 526000 **N:** 6393610 **Depth (m):**

**Sediment Description:**
Soft rippled sediment

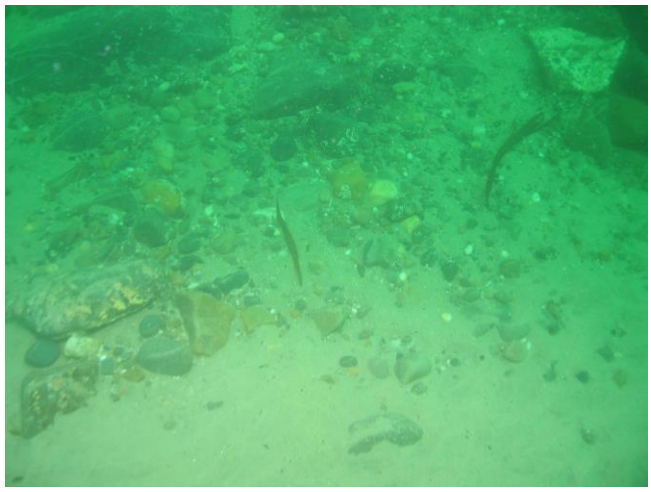
**Faunal Description:**
Echinodermata (Asteroidea ,*indet.* 001, Echinoidea *indet.* 001)



**Station:** ECR_ENV_56
**Fix:** 78 **E:** 526053 **N:** 6393551 **Depth (m):**

**Sediment Description:**
Scattered boulders

**Faunal Description:**
No visible fauna



**Station:** ECR_ENV_56
**Fix:** 82 **E:** 526037 **N:** 6393529 **Depth (m):**

**Sediment Description:**
Scattered cobles

**Faunal Description:**
No visible fauna

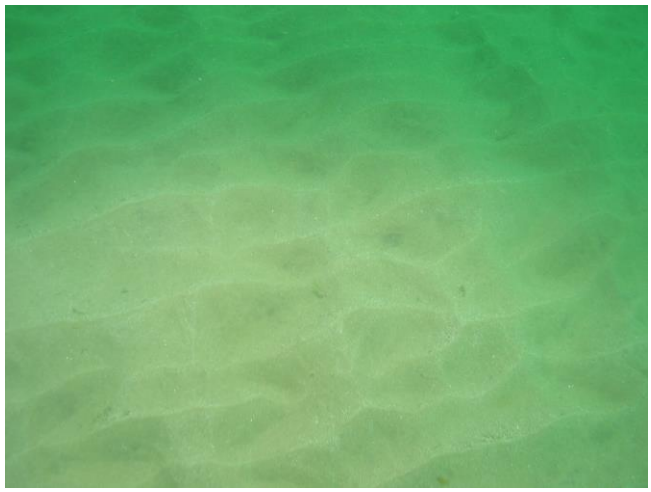
# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS



**Station:** ECR_ENV_57
**Fix:** 61 **E:** 527020 **N:** 6392987 **Depth (m):**

**Sediment Description:**
Soft rippled sediment

**Faunal Description:**
No visible fauna



**Station:** ECR_ENV_57
**Fix:** 62 **E:** 527012 **N:** 6392981 **Depth (m):**

**Sediment Description:**
Soft rippled sediment

**Faunal Description:**
No visible fauna



**Station:** ECR_ENV_57
**Fix:** 11 **E:** 527012 **N:** 6392983 **Depth (m):** 13
**Retention:** MFA

**Sediment Description:**
Fine sand with shell fragments

**Faunal Description:**
Annelida




**Station:** ECR_ENV_57
**Fix:** 11 **E:** 527012 **N:** 6392983 **Depth (m):** 13
**Retention:** MFA

**Sediment Description:**
Fine sand with shell fragments

**Faunal Description:**
Annelida

# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS






**Station:** ECR_ENV_58_A
**Fix:** 7 **E:** 523133 **N:** 6394097 **Depth (m):** **Retention:** MFA

**Sediment Description:**
Fine sand with shell fragments

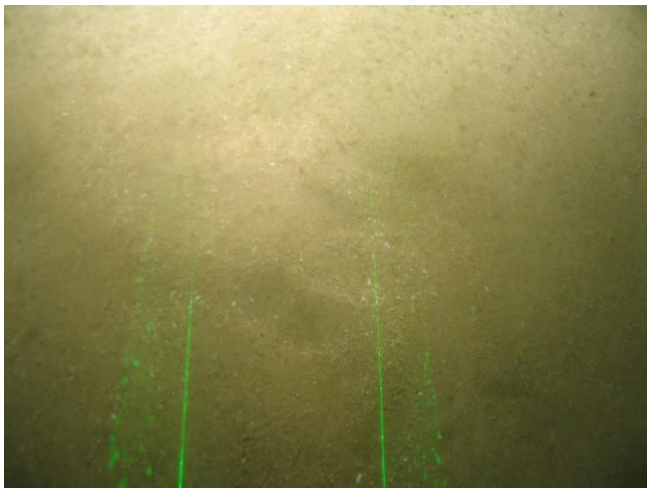
**Faunal Description:**
Annelida

**Station:** ECR_ENV_58_A
**Fix:** 7 **E:** 523133 **N:** 6394097 **Depth (m):** **Retention:** MFA

**Sediment Description:**
Fine sand with shell fragments

**Faunal Description:**
Annelida

# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS



**Station:** ECR_ENV_59
**Fix:** 7 **E:** 521454 **N:** 6395097 **Depth (m):**

**Sediment Description:**
Soft rippled sediment

**Faunal Description:**
No visible fauna



**Station:** ECR_ENV_59
**Fix:** 10 **E:** 521446 **N:** 6395095 **Depth (m):**

**Sediment Description:**
Soft rippled sediment

**Faunal Description:**
No visible fauna



**Station:** ECR_ENV_59
**Fix:** 2 **E:** 521406 **N:** 6395099 **Depth (m):** 29
**Retention:** MFA

**Sediment Description:**
Medium sand with shell fragments

**Faunal Description:**
Annelida




**Station:** ECR_ENV_59
**Fix:** 2 **E:** 521406 **N:** 6395099 **Depth (m):** 29
**Retention:** MFA

**Sediment Description:**
Medium sand with shell fragments

**Faunal Description:**
Annelida

# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS



**Station:** ECR_ENV_61
**Fix:** 4197 **E:** 523338 **N:** 6398247 **Depth (m):** 51

**Sediment Description:**
Soft sediment with shell fragments

**Faunal Description:**
Animalia tube, Cnidaria (Sertulariidae *indet.* 001), Mollusca (*Aequipecten opercularis*)



**Station:** ECR_ENV_61
**Fix:** 4202 **E:** 523348 **N:** 6398208 **Depth (m):** 51

**Sediment Description:**
Soft sediment with shell fragments and gravel

**Faunal Description:**
Annelida (Serpulidae *stet.*), Arthropoda (Galatheoidea *stet.*), Chordata (Actinopterygii *indet.* 02, *Callionymus lyra*)



**Station:** ECR_ENV_61
**Fix:** 4209 **E:** 523344 **N:** 6398166 **Depth (m):** 51

**Sediment Description:**
Soft sediment

**Faunal Description:**
Annelida (Serpulidae *stet.*)

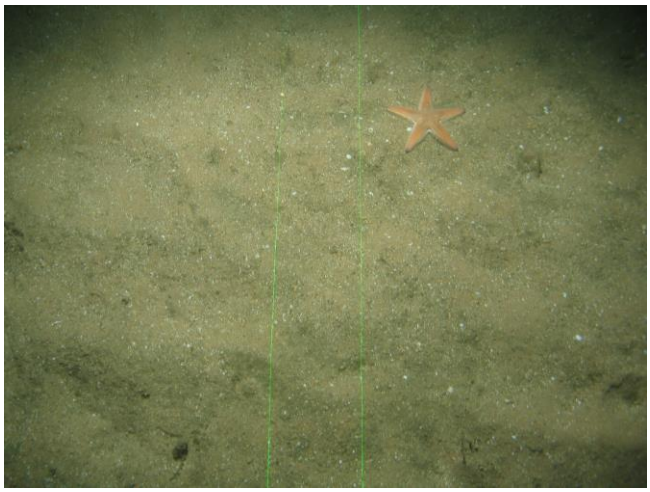


**Station:** ECR_ENV_61
**Fix:** 4221 **E:** 523370 **N:** 6398141 **Depth (m):** 51

**Sediment Description:**
Soft sediment with shell fragments

**Faunal Description:**
Animalia tube, Echinodermata (Holothuroidea *indet.* 001)

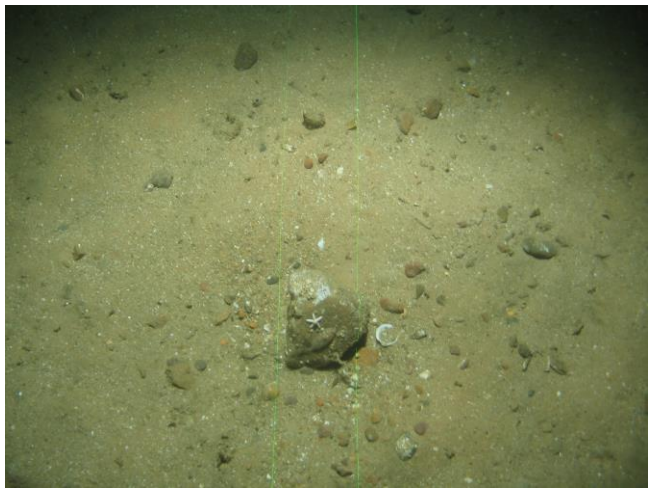
# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS



**Station:** ECR_ENV_62
**Fix:** 4229 **E:** 524124 **N:** 6397211 **Depth (m):** 46

**Sediment Description:**
Soft rippled sediment with shell fragments

**Faunal Description:**
Echinodermata (*Astropecten irregularis*)



**Station:** ECR_ENV_62
**Fix:** 4239 **E:** 524124 **N:** 6397173 **Depth (m):** 46

**Sediment Description:**
Soft sediment with scattered cobbles

**Faunal Description:**
Animalia tube, Annelida (Serpulidae *stet.*), Echinodermata (Asteroidea *indet.* 001), Porifera *indet.* GL0002



**Station:** ECR_ENV_62
**Fix:** 4246 **E:** 524125 **N:** 6397147 **Depth (m):** 46

**Sediment Description:**
Soft rippled sediment with gravel and shell fragments.

**Faunal Description:**
Annelida (Serpulidae *stet.*), Arthropoda (*Cancer pagurus*), Faunal turf



**Station:** ECR_ENV_62
**Fix:** 4262 **E:** 524126 **N:** 6397109 **Depth (m):** 46

**Sediment Description:**
Soft sediment with cobbles and boulders

**Faunal Description:**
Arthropoda (Galatheoidea *stet.*), Echinodermata (Asteroidea *indet.* 001), Mollusca (*Calliostoma stet*), Epifauna, Faunal turf

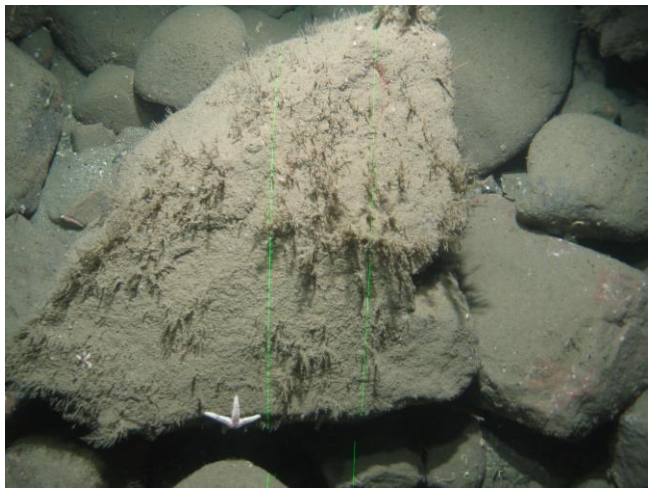
# APPENDIX C SAMPLING AND SEABED PHOTOGRAPHS



**Station:** ECR_ENV_63
**Fix:** 4381 **E:** 525817 **N:** 6420130 **Depth (m):** 61

**Sediment Description:**
Cobbles and boulders with gravel and shell fragments

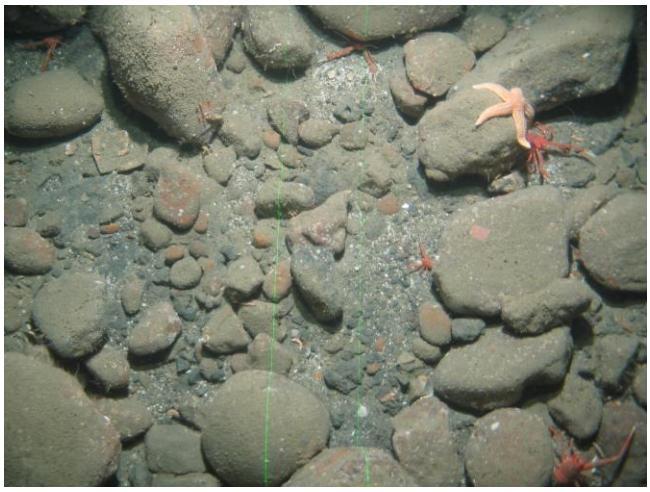
**Faunal Description:**
Annelida (Serpulidae *stet.*), Arthropoda (Galatheoidea *stet.*), Cnidaria (*Tubularia indivisa*), Epifauna, Faunal turf



**Station:** ECR_ENV_63
**Fix:** 4389 **E:** 525845 **N:** 6420118 **Depth (m):** 60

**Sediment Description:**
Scattered cobbles and boulders with soft sediment and shell fragments

**Faunal Description:**
Cnidaria (*Tubularia indivisa*), Echinodermata (*Asterias rubens*), Epifauna, Faunal turf



**Station:** ECR_ENV_63
**Fix:** 4393 **E:** 525856 **N:** 6420114 **Depth (m):** 60

**Sediment Description:**
Scattered cobbles and boulders with soft sediment and shell fragments

**Faunal Description:**
Animalia tube, Arthropoda (Galatheoidea *stet.*), Echinodermata (*Asterias rubens*), Epifauna, Faunal turf



**Station:** ECR_ENV_63
**Fix:** 4400 **E:** 525880 **N:** 6420102 **Depth (m):** 62

**Sediment Description:**
Scattered cobbles and boulders with soft sediment and shell fragments

**Faunal Description:**
Arthropoda (Galatheoidea *stet.*), Cnidaria (*Bolocera tuediae*), Echinodermata (*Asterias rubens*, Echinoidea *indet.* 001), Epifauna, Faunal turf

# APPENDIX D METHODS

# APPENDIX D METHODS

## D.1 Seabed Sampling

Benthic physico-chemical samples were recovered using a stainless-steel, 0.1m$^2$ Day grab which had been modified in-house. The modification, shown in Figure D.1 incorporated guides for the cables to prevent them becoming trapped during triggering. Low-slung pad feet when in contact with the seabed trigger the instrument. On recovery (once triggered) the weight of the instrument is transferred along the warp wires, closing the jaws of the grab. The grab carried extra weights to aid penetration on recovery and an extended bucket lip to reduce sediment washout. Storm feet and elastic straps were used to reduce the likelihood of the instrument pre-triggering in the water column during deployment.

Figure D.1 Modified Day Grab



Left: The modified 0.1m$^2$ Day grab.

Above (inset): The modification to the grab incorporated guides for the cables to prevent them from becoming trapped as the grab triggers.

Faunal and particle size samples were recovered using an in-house constructed, modified, stainless-steel 0.1m$^2$ mini-Hamon grab. The mini-Hamon grab comprises a box shaped scoop which is mechanically driven in a 90° arc through the surface sediments to close against a stainless-steel closure plate. The closure plate is lined by a rubberised gasket to retain the mixed sediment sample and also has a viewing window allowing the operator to determine the recovered volume of the sample. Tension on a trigger hook is released upon impact of the grab with the seafloor thereby allowing, on inhaul, the pivot arm to drive the scoop through the sediment. The vessel offset of grab deployment was used to represent the position of the sampler.

Grab sampling operational procedures were as follows:

The vessel's sampling area was pre-cleaned using a powerful deck fire-hose and seawater. The Day grab/mini-Hamon grab was washed thoroughly using pentane prior to deployment at every station to prevent hydrocarbon cross contamination. A 500m-length of 10mm, dry-core, galvanised-steel cable/100m-length of 8mm, steel cable was used to lower the Day grab/mini-Hamon grab to the seabed.

# APPENDIX D METHODS

All containers were thoroughly washed with appropriate solvents and labelled externally prior to use. Biology samples were placed in 1-litre polypropylene, screw-top, squat jars and/or 5 litre buckets and provided with an additional internal waterproof label. Hydrocarbon and metals samples were placed in 1L amber glass jars, whilst the remaining samples (eDNA and particle size) were placed in double-lined zip-lock bags.

Communication between the deck, bridge crew and the surveyors was conducted by means of VHF radio. When directly over the sampling station the grab was winched to the seabed and recovered so that the sample could be obtained and the apparatus prepared for the next deployment.

Positional fixes were taken for each grab sample immediately following the grab reaching the sea floor. The precise time that the grab reached the seabed was determined by observations of the tension on the winch cable.

On recovery of a sample, the grab would first be examined for acceptability following strict quality assurance criteria. In the following cases, a grab sample would be rejected and the instrument returned to the pre-deployment position:

1. Jammed sample closure due to entrapment of a large stone, shell or other objects allowing surface sediment washout.
2. Accidental premature opening of sampler on recovery, causing possible surface washout.
3. Half sample obtained where the grab had not struck a flat area of bottom, or not hit true, causing a side or half bite of sediment;
4. Disruption of the sample by obvious shaking or contamination (these can occur when a sample is badly handled or if the grab strikes the side of the vessel during operations);
5. The sample represents less than 40% of the grab's total capacity (*i.e.* less than 6 litres) or totally fills the grab. The latter potentially allowing the sample to overflow the grab or for the surface sediments to come into contact with the lids.
6. Sample was acquired more than 50m from the target (as determined by the onboard surveyors, environmentalist and client representative, with consideration of survey objectives).
7. The presence of exopolymeric substances, mucus coagulants and/or fauna that generate them *i.e.,* Myxinidae.

Brief descriptions of the collected sediments were made at the time of sampling. These were recorded in the environmentalist's log sheets and are presented in Appendix B. A selection of photographs, taken of the sediment samples whilst still in the Day grab, is presented in Appendix C.

Sediment samples were taken directly from the Day grab for physico-chemical analysis (CHEM) and sub-sampled into the relevant containers. All containers were thoroughly washed with the appropriate solvents and labelled externally prior to use. Two surficial sediment (<2cm) sub-samples were scooped directly into 1l amber glass using a stainless steel spoon; one of these was intended for hydrocarbon and metal determinations, the other was retained as a spare. Using the mini-Hamon grab, sediment samples were decanted into a suitable receptacle and homogenised. Two samples of approximately 500g comprising one each for particle size analysis (PSA) and a spare were collected using a plastic scoop, with a third sample of approximately 40g retained for eDNA analysis. All three samples were placed in double-lined zip-lock bags.

All physico-chemical and eDNA sediment samples were transferred to an onboard freezer for storage at less than -18ºC.

Sediment samples collected for faunal analyses (MFA and MFB) were thoroughly washed from the grab into a plastic tray. Once all of the equipment was washed free of sediment, the sediment sample was transferred to a

sieving machine where it was broken down using a low powered seawater spray. All materials retained by the 1mm mesh sieve were transferred to a squat jar or bucket by means of a scoop and funnel, making sure that none of the sample was lost or trapped in the mesh. The sample was fixed with a pre-buffered <20% formalin solution of known concentration, then subsequently diluted to a final concentration of approximately 4% formalin. Biological samples were placed in 1 litre polypropylene screw-top squat jars or 5 litre buckets, depending on sample size, and provided with an additional internal waterproof label.

## D.2 Water Sampling

Niskin bottles were mounted directly to the 11mm coaxial deployment cable along with a purse weight to maintain vertical transit and a messenger weight affixed to allow acquisition of sample. A fix was taken immediately after release of the messenger and prior to recovery.

Water samples were taken 5m from the seabed and 5m from the surface. On recovery of the water sample, the Niskin bottles would first be examined for acceptability following strict quality assurance (QA) criteria. In the following cases, a water sample would be rejected, and the instrument prepared for the next deployment:

1. One or both ends have not released, and the sampler has failed to trigger.
2. One or both ends have failed to seal the sample and water has leaked out.
3. Disruption of the sample by obvious shaking or contamination.
4. Sample was taken an unacceptable distance or depth from the target.

Details of collected samples were made at the time of sampling. These were recorded in the environmentalist's log sheets and presented in Appendix B. Each 5-litre water sample was decanted from the Niskin bottle into a sterilised bag and filtered through a specialised filter kit. Two samples were retained for each depth, one intended for analysis and one retained as a spare. The primary filter - used for the analysis of fish eDNA and vertebrate eDNA - and the spare filter were both placed into labelled zip-lock bags and transferred to an onboard freezer for storage at less than -18ºC.

## D.3 Sample Analysis

At the end of the survey, all of the retained samples for analysis were delivered directly to their respective laboratories for analysis. The remaining samples were delivered to Gardline's Great Yarmouth office. All physico-chemical sub-samples were kept frozen, and biological and water eDNA samples stored at room temperature. Spares of one physico-chemical and one hydrocarbon sub-sample from each station were stored frozen, and one biological sample from each station stored at room temperature. Spare samples are retained at Gardline's Great Yarmouth office for at least six months after which time the client is contacted to advise on appropriate disposal, continued storage or dispatch to a destination of the client's choice.

Sediment and faunal samples were analysed by the following laboratories / persons:

- Sediment hydrocarbon, metals, total organic carbon (TOC), polyaromatic hydrocarbons (PAHs), polychlorinated biphenols (PCBs), organotins, organochlorine pesticides (OCPs) and polybrominated diphenyl esters (PBDEs) analyses were carried out by SOCOTEC, Burton-on Trent, Staffordshire, UK.
- Benthic macrofaunal identification and PSA was undertaken by Thomson Environmental Consultants Limited, Guildford, UK;
- eDNA metabarcoding was carried out by Nature Metrics Ltd, Egham, UK.

The laboratories detailed above meet quality control requirements exacted by Gardline's internal procedures (BS/EN/ISO 9001:2015; BSI, 2015).

# APPENDIX D METHODS

## D.4 Particle Size Analysis

Particle size analysis was carried out by Thomson Environmental Consultants Limited in accordance with NMBAQC methods for diamictons (Mason, 2016).

No dispersants were used and the sediment was not treated to remove carbonates or organic matter prior to analysis. The range of sieve sizes, together with their Wentworth classifications (Wentworth, 1922), is given in Table D.1.

The results, given in Appendix G and summarised in Section 2.5.1, present particle size distributions in terms of mean phi, fraction percentages (*i.e.*, gravel, sand and fines), sorting (mixture of sediment sizes) and skewness (weighting of sediment fractions above and below the mean sediment size) and kurtosis (degree of peakedness) (Folk & Ward, 1957). These indices are described below:

1. Graphic Mean - a measure of average particle size in phi units (-log2(diamm), Folk & Ward, 1957).

$$M_z = \frac{\emptyset 16 + \emptyset 84 + \emptyset 50}{3}$$

where $M_z$= The graphic mean particle size in phi
ø = the phi size of the n$^{th}$ percentile of the sample

2. Sorting – the inclusive graphic standard deviation of the sample is a measure of the degree of sorting. Sorting classifications are presented in Table D.2.

$$\sigma_1 = \frac{\emptyset 84 - \emptyset 16}{4} + \frac{\emptyset 95 - \emptyset 5}{6.6}$$

where $\sigma_1$ = the inclusive graphic standard deviation

3. Inclusive Graphic Skewness – the degree of asymmetry of a frequency or cumulative curve, Skewness classification are presented in Table D.3.

$$S = \frac{\emptyset 16 + \emptyset 84 - 2(\emptyset 50)}{2(\emptyset 84 - \emptyset 16)} + \frac{\emptyset 5 + \emptyset 95 - 2(\emptyset 50)}{2(\emptyset 95 - \emptyset 5)}$$

where $S$= the skewness of the sample

4 Graphic Kurtosis – The degree of peakdness or departure from a 'normal' frequency or cumulative curve. Kurtosis classifications are presented in Table D.4.

$$K = \frac{\emptyset 95 - \emptyset 5}{2.44(\emptyset 75 - \emptyset 25)}$$

where $K$= Kurtosis

The sediment samples were additionally classified using the modified Folk triangle classification and the EUNIS classification (Figure D.2), with results presented in 1Appendix G. These classifications use the sand:mud ratio and the percentage of gravel (Folk, 1954; Parry, 2019).

# APPENDIX D METHODS

## Table D.1 Phi and Sieve Aperture with Wentworth Classifications

| Aperture in microns | Aperture in Phi Unit | Sediment Description | |
|---|---|---|---|
| <63000 to 45000 | >-6 to -5.5 | Pebble | GRAVEL |
| <45000 to 32000 | >-5.5 to -5 | | |
| <32000 to 22600 | >-5 to -4.5 | | |
| <22600 to 16000 | >-4.5 to -4 | | |
| <16000 to 11200 | >-4 to -3.5 | | |
| <11200 to 8000 | >-3.5 to -3 | | |
| <8000 to 5600 | >-3 to -2.5 | | |
| <5600 to 4000 | >-2.5 to -2 | | |
| <4000 to 2800 | >-2 to -1.5 | Granule | |
| <2800 to 2000 | >-1.5 to -1 | | |
| <2000 to 1400 | >-1 to -0.5 | Very Coarse Sand | SAND |
| <1400 to 1000 | >-0.5 to 0 | | |
| <1000 to 710 | >0 to 0.5 | Coarse Sand | |
| <710 to 500 | >0.5 to 1 | | |
| <500 to 355 | >1 to 1.5 | Medium Sand | |
| <355 to 250 | >1.5 to 2 | | |
| <250 to 180 | >2 to 2.5 | Fine Sand | |
| <180 to 125 | >2.5 to 3 | | |
| <125 to 90 | >3 to 3.5 | Very Fine Sand | |
| <90 to 63 | >3.5 to 4 | | |
| <63 to 44 | >4 to 4.5 | Coarse Silt | FINES |
| <44 to 31.5 | >4.5 to 5 | | |
| <31.5 to 22 | >5 to 5.5 | Medium Silt | |
| <22 to 15.6 | >5.5 to 6 | | |
| <15.6 to 11 | >6 to 6.5 | Fine Silt | |
| <11 to 7.8 | >6.5 to 7 | | |
| <7.8 to 5.5 | >7 to 7.5 | Very Fine Silt | |
| <5.5 to 3.9 | >7.5 to 8 | | |
| <3.9 to 2.8 | >8 to 8.5 | Clay | |
| <2.8 to 2 | >8.5 to 9 | | |
| <2 to 1.4 | >9 to 9.5 | | |
| <1.4 to 1 | >9.5 to 10 | | |
| <1 | >10 | | |

# APPENDIX D METHODS

## Table D.2 Sorting Classifications

| Sorting Coefficient (Graphical Standard Deviation) | Sorting Classifications |
|---|---|
| 0 < 0.35 | Very well sorted |
| 0.35 < 0.50 | Well sorted |
| 0.50 < 0.71 | Moderately well sorted |
| 0.71 < 1.00 | Moderately sorted |
| 1.00 < 2.00 | Poorly sorted |
| 2.00 < 4.00 | Very poorly sorted |
| 4.00 | Extremely poorly sorted |

## Table D.3 Skewness Classification

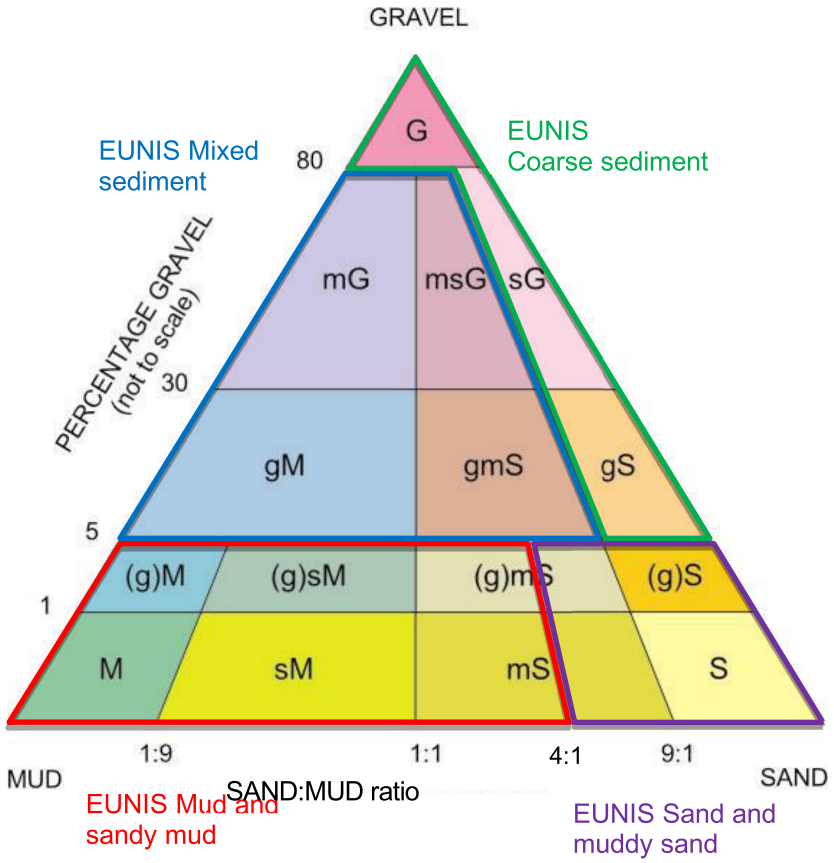
| Skewness Coefficient | Mathematical Skewness | Graphical Skewness |
|---|---|---|
| 1.00 > 0.30 | Strongly Positive | Strongly fine skewed |
| 0.30 > 0.10 | Positive | Fine skewed |
| 0.10 > -0.10 | Near Symmetrical | Symmetrical |
| -0.10 > -0.30 | Negative | Coarse skewed |
| -0.30 > -1.00 | Strongly Negative | Strongly coarse skewed |

## Table D.4 Kurtosis Classification

| Kurtosis Coefficient | Kurtosis Classification | Graphical meaning |
|---|---|---|
| ≤ 0.67 | Very Platykurtic | Flat-peaked; the ends are better sorted than the centre |
| 0.67 < 0.90 | Platykurtic | |
| 0.90 < 1.11 | Mesokurtic | Normal; bell shaped curve |
| 1.11 < 1.50 | Leptokurtic | Curves are excessively peaked; the centre is better sorted than the ends |
| 1.50 < 3.00 | Very Leptokurtic | |
| ≥ 3.00 | Extremely Leptokurtic | |

# APPENDIX D METHODS

Figure D.2 Modified Folk Classification and EUNIS Sediment Classes




| Code | Modified Folk Classification |
|---|---|
| G | Gravel |
| mG | Muddy gravel |
| msG | Muddy sandy gravel |
| sG | Sandy gravel |
| gM | Gravelly mud |
| gmS | Gravelly muddy sand |
| gS | Gravelly sand |
| (g)M | Slightly gravelly mud |
| (g)sM | Slightly gravelly sandy mud |
| (g)mS | Slightly gravelly muddy sand |
| (g)S | Slightly gravelly sand |
| M | Mud |
| sM | Sandy mud |
| mS | Muddy sand |
| S | Sand |

Source: Folk (1954) and Parry (2019)

## D.5 Total Organic Carbon

A 0.25g aliquot of air dried and ground (particle size <118µm) sample was mixed with 10ml of analytical grade sulphurous acid and allowed to effervesce at 40°C for fourteen hours in order to remove any inorganic carbon. The digested sample was then heated to 105°C until any remaining acid had evaporated and the sample had dried. The dried residue was then analysed for carbon content using an Eltra induction furnace, fitted with a non-dispersive infrared (NDIR) cell. In this instrument the sample was combusted at 1600°C in an oxygen atmosphere, the combustion gases pass through the NDIR cell which measures the carbon dioxide ($CO_2$) concentration. The total quantity of carbon liberated is calculated and reported as a percentage of the original mass of sample.

The method is calibrated every day and incorporates a three point calibration (including blank) using matrix matched standards sourced from traceable material. The calibration range extends to 4.0%. Any samples that are over-range are re-extracted with reduced sample weight and re-analysed. The method is statistically controlled using both process and instrument quality control samples. Both are sourced independently from the solutions used to calibrate the method. Instrument and process blank solutions are also run at regular intervals (with each batch) to monitor potential sources of contamination.

The results are expressed as % w/w of a dry sample and will not include volatile organic carbons, the majority of which are lost during digestion and drying. The upper range limit of this technique has not been investigated, whilst the lower limit is dependent on the sensitivity of the furnace and the sample weight taken. In practice, the limit of detection (LOD) is 0.02% of sample weight. The standard used was OAS Acetanilide.

# APPENDIX D METHODS

## D.6 Hydrocarbons

### D.6.1 Extraction Procedures

A 15g sub-sample of the sample was treated with 15ml of methanol and 60ml of dichloromethane (DCM) and mixed on a magnetic stirring plate for one hour (wet vortex extraction). The solvent extract was then chemically dried, water partitioned and then reduced to approximately 1ml using a Kuderna Danish evaporator with micro Snyder. The clean -up stage utilised 1g of activated silica gel along with DCM and pentane, which removes polar organics. One third of the column was made up with the DCM/Silica slurry and then the column was eluted with 9ml of DCM and 3ml of pentane. The 1ml of DCM extract was then eluted through the column with a further 1ml of DCM and 2ml of Pentane giving a final extract of 4ml (DCM:pentane). The samples were then subjected to a further copper clean up stage to remove any sulphur.

A separate sub-sample was taken for analysis of moisture content by drying at 120ºC for 8 hours. The moisture content was later used to convert the hydrocarbon concentrations from wet weight to dry weight.

### D.6.2 Analysis by Gas Chromatography

An aliquot of the extract was then taken and analysed for total hydrocarbons and individual n-alkanes by large volume injection GC-FID and one taken to be analysed for PAH and alkylated isomer concentrations by GC-MS selected ion monitoring as specified in DTI (1992).

Appropriate column and GC conditions were used to provide sufficient chromatographic separation of all analytes and required sensitivity. GC chromatograms are presented in Appendix I.

### D.6.3 Quality Control Samples

All samples have surrogates and internal standards (heptamethylnonane (A), 1-chlorooctadecane (B) and squalane (C)) added prior to commencement of extraction. Decanoic acid and eicosanoic Acid were added to the sample post extraction but prior to the clean up stage. These are reverse surrogates to measure the clean up. The method was statistically controlled using both process and instrument quality control samples. Both were sourced independently from the solutions used to calibrate the method. Three instrument blanks of 50:50 pentane:DCM were run initially and one after the continuing calibration check (CCC) before any samples. Two method blanks and an in-house prepared reference material were analysed with each batch and process blank solutions were also run at regular intervals (with each batch) to monitor potential sources of contamination.

### D.6.4 Calibration and Calculation

Two calibration check standards are measured by GC-FID before and after each batch. The first CCC is a florida mix used to calibrate the individual alkane method and determine retention times and areas for the $nC_{10}$ – $nC_{40}$ alkane groups. The second CCC is a diesel/mineral oil mix which provides the odd alkane group retention times from $nC_{11}$ – $nC_{27}$, pristane and phytane. The second CCC is used to calibrate the total petroleum hydrocarbons area.

Concentrations of total hydrocarbons from the extract analysed by GC-FID were quantified by comparison with the chromatographic envelopes from the mixed diesel/mineral oil calibration standards. The concentration in the sample was then calculated against the squalene surrogate. The chromatographically resolved individual n-alkane peaks $nC_{10}$-$nC_{37}$ were quantified using the florida mix standard.

The GC/MS is calibrated initially at four concentrations to confirm linearity of each target compound across the working range. With each batch a calibration check standard is measured before and after each batch and the

concentration calculated from the slope of the four point initial calibration. The CCC is used to calibrate the method and samples are quantified using the CCC response factors.

Concentrations of PAH from the extract analysed by GC-MS were determined by referencing individual quantified mass peak areas for each target compound to the appropriate internal standard quantified mass peak area and the relative response factor calculated from the applicable CCC standard.

The analysis detection limits were 1ng $g^{-1}$ for PAHs and 100ng $g^{-1}$ for THC.

### D.6.5 Polychlorinated Biphenyl and Organochlorine Pesticides

A portion of air-dried and sieved sample was spiked with 13C labelled internal standards, ultrasonically solvent extracted and concentrated under nitrogen. A clean-up stage was employed to remove contaminants that may have interfered with the analysis. The sample extract was analysed by gas chromatography coupled to a triple quadrupole mass spectrometer (GC-MS-MS). Quantification was performed by comparison with a solution containing each of the targeted compounds, normalised to the 13C labelled internal standards.

### D.6.6 Polybrominated Diphenyl Ethers

A portion of air-dried and sieved sample was treated with 13C labelled internal standards before being extracted using an automated extraction system and concentrated under nitrogen. A clean-up stage was employed to remove contaminants that may have interfered with the analysis. The sample extract was analysed by gas chromatography coupled to a triple quadrupole mass spectrometer (GC-MS-MS) with a cooling injection system. Quantification was performed by comparison with a solution containing each of the targeted compounds, normalised to the 13C labelled internal standards.

### D.6.7 Organotins

A portion of the received sample was digested with hydrochloric acid and methanol before being extracted into toluene. The extract was then derivatized using sodium tetraethylborate (STEB) before concentration and a copper/silica clean-up was performed. The extract was analysed by GC-MS and quantified by comparing the results against a calibration curve for each of the target analytes.

## D.7 Metals

### D.7.1 Aqua Regia Extractions for ICP-MS Determination

Approximately 1g of air-dried and ground (particle size <118µm) sediment was accurately weighed and placed in a Teflon digestion vessel. The microwave digestion process involved a two stage extraction process. The digest is made up to 100ml in a Gradplex flask. The sample was then analysed by inductively coupled plasma-mass spectrometry (ICP-MS).

### D.7.2 Inductively Coupled Plasma – Mass Spectrometry (ICP-MS)

All metals were determined by ICP-MS. The spectrometer was calibrated using seven different concentrations of matrix-matched standards made from dilutions of 10g $l^{-1}$ spectroscopic standard solutions. Target analyte concentrations were measured by direct comparison to the internal standard with the nearest mass ionisation properties, to take into account changes in plasma conditions as a result of matrix differences between standards and samples. Detection limits and the atomic mass units of the various elements analysed are presented in Table C.5.

# APPENDIX D METHODS

Table C.5 ICP Detection Limits, Elemental Emission Wavelengths and Atomic Masses

| Analysis | ICP-MS | Aqua Regia Extraction |
|---|---|---|
| Element | Atomic Mass Units | LOD (µg $g^{-1}$) |
| As | 75 | 0.5 |
| Cd | 111 | 0.04 |
| Cr | 52 | 0.5 |
| Cu | 65 | 0.5 |
| Ni | 60 | 0.5 |
| Pb | 208 | 0.5 |
| Zn | 66 | 2 |
| Hg | 202 | 0.01 |

### D.7.3 Quality Control

Quality control consists of running full method blanks together with one in-house reference material or certified reference material where required, and one duplicate sample per batch of twenty samples. Instrument performance is monitored by the use of instrument blanks, continuing calibration checks and independent calibration checks.

Instrument and process blank solutions are also run at regular intervals (with each batch) to monitor potential sources of contamination.

## D.8 Sediment Metabarcoding

### D.8.1 DNA Extraction and Sequencing

Water samples were collected offshore using a single filter for both the fish and vertebrate samples. In the laboratory, DNA was extracted using a commercial DNA extraction kit. An extraction blank was also processed for each extraction batch. Purified DNA extracts were amplified with PCR utilising primers that target a specific region of a barcode gene. The PCR is repeated multiple times per sample to maximise the detection of target species. Amplification success was determined by gel electrophoresis. All purified index PCRS were pooled into final libraries with each sample added in equal quantities. Illumina MiSeq was used to sequence the final library.

### D.8.2 Bioinformatics

Sequence data were processed for quality filtering, OTU clustering and taxonomic assignment. Taxonomic assignments were made for each OTU using sequence similarity searched against four reference databases appropriate for the dataset. Taxonomic consistency between databases was determined with Global Biodiversity Information Facility (GBIF). Results for all searches were combined and assignments made to the lowest possible taxonomic level where there was consistency.

## D.9 Macrofaunal Analysis

### D.9.1 Sorting and Identification

In the laboratory, samples were gently washed across a 1mm mesh sieve to remove any sediment fines and preservative. The retained material was sorted by hand to extract all macrofauna. The organisms were identified and counted to produce a species list for each grab sample. Sample residues were checked by a second individual to provide a degree of quality control.

# APPENDIX D METHODS

## D.9.2 Data Set Rationalisation

The faunal data set was rationalised according to the standard Gardline (2022) procedure, which is largely based on British Standard ISO16665:2005 (BSI, 2005) and OSPAR (2017) guidelines. A summary of these methods follows.

*Juveniles*

The inclusion of juvenile organisms in data sets is a contentious issue, as is the definition of a juvenile. Only when the following conditions were satisfied was an organism recorded as a juvenile:

- Organisms that were too small or immature to be identified to species were identified to the lowest possible taxonomic level and recorded as juveniles.
- The organism was in a pre-adult life stage *e.g.* megalopa, praniza, *etc.*
- For large-bodied (>4cm) species of echinoderm and bivalve, the organism was less than 10% of the maximum body size reported in the literature.

In accordance with ISO16665:2005 guidelines, juveniles are recorded separately in the faunal list in Appendix M. Juveniles were included in the analysed data set at the lowest achievable taxonomic level. In the first instance, statistical analyses were performed after counts of juveniles of known species had been combined with adult records of that same species. In accordance with OSPAR (2017), if one or more of the juvenile taxa, or species that included juvenile records, were among the ten most dominant, then a RELATE analysis was carried out to compare the data sets with and without juveniles to determine if discussion of both sets separately is required. If the two data sets are found to be at least 95% similar, then the juveniles are included in the data set for all further multivariate analyses and discussion. Alternatively, the multivariate analyses are additionally performed following exclusion of all juvenile records to illustrate their influence.

*Damaged Specimens*

Destructive sampling techniques and sieving may damage delicate benthic organisms. It is, therefore, commonplace for fragmented organisms to be found in faunal samples. The following conditions were applied to the recording of damaged specimens and fragments:

- Fragments that constituted a major component of an individual, that unequivocally represented the presence of an entire organism, and that could be identified to species level, were recorded and included with other counts of that species. Examples include: the heads of polychaetes and crustaceans; the complete mouth structure or central disk of brittle stars; the oral area/feeding tentacles of holothurians.
- Fragments that constituted a significant component of an individual, that unequivocally represented the presence of an entire organism, but that could not be identified to species by virtue of their incompleteness, were recorded to the lowest possible taxonomic level.
- Fragments that did not unequivocally represent the presence of an entire organism were ignored, *e.g. Ophiura* arms, *Echinocardium* shell fragments, *etc*.

Recorded fragments, therefore, represent discrete observations of individuals that were present at the time of sampling and were included in the analysed data set.

*Treatment of Specific Groups of Organisms*

Gardline defines macrofauna as organisms that are normally larger that the mesh size of the sieve used to separate them from the sediment (Gardline, 2022). Meiofaunal organisms, such as Ostracoda and Copepoda, which would not be consistently sampled, were not recorded. Due to their generally small size (in fully marine environments), species from the Oligochaeta, Tardigrada and Gnathostomulida were only enumerated when a

sieve with a mesh size of 0.5mm or less was used to separate organisms from sediments; otherwise, these organisms were noted to be present, but not enumerated.

Planktonic organisms, such as Chaetognatha were not recorded. The presence of nektonic species, such as fish and Cephalopoda, was recorded, but they were not enumerated.

Colonial, stoloniferous and encrusting epibenthic species were identified but not enumerated.

With the exception of discrete sea pen (Pennatuloidea) colonies, only solitary tunicates and cnidarians were enumerated and included in statistical analyses. Colonial tunicates and cnidarians were identified but not enumerated.

The testate amoeba *Astrorhiza* sp. was the only foram routinely enumerated.

In accordance with our in-house guidelines the following organisms were not identified to species, but were enumerated and included in the data set for analyses at a higher taxonomic level:

- Nemertea – identified to phylum
- Platyhelminthes – identified to phylum
- Phoronida – identified to genus
- Hemichordata – identified to phylum.

### D.9.3 Biomass

Following identification of the sample, each individual taxon (where required) were biomasses by wet weight. Biomass were weighed in grams recorded to 4d.p.

## D.10 Statistical Analyses

### D.10.1 Hydrocarbon Indices

In order to aid the determination of hydrocarbon sources and levels of weathering of recorded hydrocarbons, a number of indices (largely based on n-alkanes) have been developed (Tran *et al.*, 1995). The following indices were calculated from raw data using Microsoft Excel:

*Carbon Preference Index (CPI)*
The ratio of odd to even numbered alkanes, commonly referred to as the CPI, may provide further insight into the origin of alkanes in marine sediments. Opinions differ as to which is the most informative chain length over which to calculate CPI. Douglas and Eglinton (1966) suggest that the $nC_{20}$ to $nC_{36}$ range is most informative, whilst Farrington and Tripp (1977) suggest CPI calculated using $nC_{27}$ to $nC_{33}$ alkanes is most informative. The basic premise of most CPI calculations is that land-based vegetation predominantly produces alkanes with odd carbon numbers (*i.e.*, $nC_{29}$), whereas there is no such tendency in alkanes of anthropogenic or marine origin. Therefore, the sum of odd numbered alkanes divided by the sum of even numbered alkanes decreases with increasing petrogenic contamination. Jeng (2006) indicates that the tendency for land-based vegetation to predominantly produce alkanes with odd carbon numbers is most prevalent in the $nC_{27}$ to $nC_{33}$ range.

The carbon preference index of Farrington and Tripp (1977), which is used more often than any other in the literature, is calculated as follows:

$$CPI = \frac{2(nC_{27} + nC_{29})}{nC_{26} + 2(nC_{28}) + nC_{30}}$$

CPI values close to unity suggest that sediments are contaminated with petrogenic material; whereas values of 4 and above suggest a dominance of biogenic material and a virtual absence of petrogenics.

*Pristane/Phytane Ratio*

Pristane and phytane are both biogenic and petrogenic but their relative abundance may vary greatly. Pristane is primarily biogenic and most commonly originates from the decomposition of a phytol side-chain of chlorophyll (Muniz *et al.*, 2004). Elevated concentrations of pristane in sediments can be indicative of high levels of microbial degradation. Phytane is rarely produced biogenically but is a common component of crude oil (Steinhauer & Boehm, 1992); it is generally absent or found in only small quantities in marine sediments. Concentrations of pristane and phytane, and their ratio to each other have, therefore, been used as an indicator of petrogenic contamination (Berthou & Friocourt, 1981). In samples that are contaminated by petroleum products the concentrations of pristane and phytane are usually nearly equal (pristane/phytane ratio close to unity) (McDougall, 2000).

*Molecular weight PAH Indices*

Information regarding the possible petrogenic or pyrogenic sources of PAHs in the environment can be derived from the ratio of PAH compounds of the same molecular weight as detailed by Yunker *et al*., (2002) and adopted by Fisner *et al.,* (2013). Fisner *et al.,* (2013) states that the identification of possible sources can be made according to the ratios that are commonly used in studies related to sediment analysis, such as:

- Ratio of 178 Molecular Weight PAHs (Ant/(Ant+Phe)), where Ant=anthracene, Phe=phenanthrene and values ≤0.10 indicate the dominance of petrogenic sources and >0.10 indicate the dominance of pyrogenic sources;
- Ratio of 202 Molecular Weight PAHs (Fluo/(Fluo+Py)), where Fluo=fluoranthene, Py=pyrene and values ≤0.40 indicate the dominance of petrogenic inputs and >0.40 indicated the dominance of pyrogenic sources;
- Ratio of 228 Molecular Weight PAHs (BaA/(BaA+Ch)) where BaA=benz[a]anthracene, Ch=chrysene and values ≤0.20 indicate the dominance of petrogenic PAHs, >0.20 to ≤0.35 a mixture of inputs and >0.35 the dominance of pyrogenic inputs;
- Ratio of 276 Molecular Weight PAHs (IP/(IP+Bghi)) where IP=indeno[1,2,3-cd]pyrene, Bghi=benzo[g,h,i]perylene and values ≤0.2 indicate the dominance of petrogenic sources and >0.50 indicate the dominance of pyrogenic sources.

### D.10.2 Univariate Macrofauna Indices

Univariate community analyses were undertaken using the PRIMER (version 7) software package. Univariate indices seek, by means of a single number, to summarise information about some aspect of community structure. The two aspects of community structure contributing to the concept of diversity are species richness (a measure related to the total number of species present) and evenness (a measure relating to the pattern of distribution of individuals among the species present).

Diversity indices, as typified by the Shannon-Wiener index, are considered to be a relatively insensitive measure of anthropogenic disturbance. However, benthic ecologists have been able to demonstrate a clear inverse relationship between diversity and total oil concentrations in sediments (Davies *et al.*, 1984). They are therefore of some practical use for making comparisons between stations and sites.

The following indices were calculated and are presented in the report:

# APPENDIX D METHODS

*Margalef's Richness Index*

Species richness is sometimes given simply as the number of species in a sample but this is of course very dependent upon sample size. Alternatively, Margalef's index (*d*) may be used as this takes account of the number of species present for a given number of individuals. Margalef's richness index is calculated as follows:

$$d = \frac{(S-1)}{\ln N}$$

where $d$ = Margalef's richness
$S$ = total number of species
$N$ = total number of individuals

*Shannon-Wiener Diversity Index*

This is a widely used measure of diversity providing an integrated index of species richness and relative abundance (Clarke & Warwick, 2006). It is basically a measure of the difficulty of predicting the identity of an individual based on overall community composition. The Shannon-Wiener diversity index is expressed as:

$$H' = -\sum_{i=1}^{s} p_i \log_n p_i$$

where $H'$= Shannon-Wiener diversity index
$p_i$ = proportion of the total number of individuals from the $i^{th}$ species.
$n$ = log base value (log base 2 is used during this report; Shannon & Weaver, 1949)

H' integrates the number of species and individual abundance to provide a summary value reflecting the diversity of fauna at a station. This index of diversity is influenced by both species richness (*i.e.* the number of species) and evenness (or equitability) of distribution of individuals between species.

*Simpson's Dominance Index*

Simpson's is a dominance index derived from the probability of picking two individuals from a community at random that are from the same species. Therefore Simpson's dominance index values with be large when a community is dominated by one or a few species but lower when the community is diverse. Simpson's dominance index was calculated as follows:

$$\lambda = \sum {p_i}^2$$

where $\lambda$ = Simpson's dominance index
$p_i$ = proportion of the total number of individuals from the $i^{th}$ species

Simpson's dominance index ranges from 0 to 1 with values typically reflecting the abundances of the most common species in the samples.

*Pielou's Evenness*

Evenness (or equitability) is a representation of how uniformly individuals are spread between species in a sample. It is a component of, and calculated using, a theoretical diversity measure (in this instance Shannon-Wiener). Values range from 0 to 1 with high values indicating low dominance and high evenness (*N.B.* the log base that was used to calculate H' must also be used to calculate evenness).

$$J = \frac{H'}{\log_n S}$$

where $J$ = Pielou's evenness
$H'$ = Shannon-Wiener diversity index
$S$ = total number of species in a sample

*Species Accumulation Curves*

Species accumulation curves show the increasing total number of different taxa observed as samples are successively pooled. Two versions are plotted in this report; the first (plotted in blue) simply takes the samples in their label order, this is often referred to as the "species observed" (Sobs) curve. The second curve (plotted in red) is smooth as it is an averaged output based on the samples being added in random order 999 times. This is referred to as the UGE (Ugland, Gray, Ellingsen) curve after Ugland *et al.*, (2003).

*Species Ranking*

A measure of the overall dominance pattern in the sampling area may be achieved by ranking the top species per station according to abundance, giving a rank score of ten to the most abundant species, decreasing to one for the tenth most abundant species, and summing these scores for all stations to provide an overall dominance score for each species (Eleftheriou & Basford, 1989). For those species ranked in the top ten, the fidelity of the species ranking can be assessed by comparing the actual rank score with the maximum possible score (thus ten multiplied by number of stations for the top rank, etc.) for that rank as a proportion; perfect fidelity is equal to one; values lower than 0.8 or higher than 1.2 represent erratic ranking, as in a species with a patchy distribution.

### D.10.3 Multivariate Analyses

In addition to univariate analyses, the data were subjected to multivariate analysis using a number of different methods available within the PRIMER package (Clarke & Warwick, 2006). By considering the full data matrix as a whole and comparing each station with every other, multivariate analyses are able to highlight subtle trends in data sets that are commonly not identified when using univariate techniques. Multivariate techniques are not restricted to use with faunal data sets and if treated appropriately may also be used to compare complex physico-chemical data sets. Multivariate analyses were computed from resemblance or similarity matrices. In the case of faunal abundance data these were constructed using the Bray-Curtis measure of similarity following transformation of the data to down-weight the influence of highly abundant or dominant species. For the purposes of this survey, a square root transformation was utilised. According to Clarke and Warwick (2006), square root transformation allows the intermediately abundant species to contribute to the similarity, while a fourth root takes account of the rarer species. Chemical data resemblance matrices are computed using Euclidean Distance following transformation (where necessary) and normalisation to standardise measurement scales.

*Cluster Analysis and SIMPROF*

Cluster analysis groups samples according to their similarity *i.e.*, samples within a group are more similar to each other than they are to samples in other groups. Clustering was by a hierarchical agglomerative method using group average sorting, and the results are presented as a dendrogram. Using PRIMER v7 it is possible to perform a SIMPROF (similarity profile) test at the same time as the cluster analysis to determine whether groups of samples are statistically indistinguishable or whether they contain identifiable structure. SIMPROF is an *a priori* test designed to identify groups of samples from unstructured data sets. The test employs a permutation-based analysis to determine whether groups of samples below each successive node of a dendrogram possess identifiable internal structure. If the result of a test at a particular node is not significant there is no identifiable structure within the samples below the node and they might therefore be considered to be a uniform group. A significant result indicates that samples within a group (below a particular node in the

dendrogram) contain some structure and therefore may not be considered uniform. The analysis therefore identifies groups of samples that are each highly self-similar and also that are distinguishable from each other.

*Ordination Analyses using non-Metric Multidimensional Scaling*

Non-metric multidimensional scaling (nMDS or MDS) is a type of ordination method which creates a 2- or 3-dimensional 'map' of the samples (or stations) from the similarity matrix. The configuration of the samples on the 'map' is a reflection of their similarity, with distances between samples being representative of their dissimilarity.

It is normal for there to be some distortion (stress) between actual similarity values (in the resemblance matrix) and distance between samples on the ordination plot; perfect solutions are very rarely achieved when dealing with complex data sets. In order to achieve the lowest possible stress PRIMER adopts an iterative approach to ordination, constructing the plot by successively refining the positions of samples until the lowest stress is achieved. In reality the lowest possible stress is not always achieved since data points may become trapped in local minima. It is therefore necessary to re-run the analyses multiple times to ensure that the lowest achievable stress is found. The ordination analysis results reported were the product of a minimum of 25 restarts. In instances where the lowest achieved stress was found for <5 (20%) of the restarts the ordination was repeated with 999 restarts to ensure that a lower stress result could not be found.

The scale and orientation of MDS ordinations are arbitrary so no axes are drawn on the plots. Stress values increase with sample size, and usually also with increasingly severe transformation of the initial data set (due to the increasing influence of rarer species on the outcome of analyses). The stress value may be used as an indication of the usefulness of plots, with a general guide being as follows (Clarke & Warwick, 2006):

| | |
|---|---|
| <0.05 | Almost perfect representation of rank similarities |
| 0.05 to <0.1 | Good representation |
| 0.1 to <0.2 | Still useful |
| 0.2 to <0.3 | Should be treated with caution |
| >0.3 | Little better than random points |

*BEST (BIOENV and BVSTEP)*

Where differences in macrofaunal community structure are found it is acceptable to attempt to link these to abiotic variations in the environment. This may be achieved using multivariate routines in the PRIMER called BVSTEP and BIOENV. In this instance BVSTEP analysis has been used due to the large size of the data sets.

BIOENV searches amongst a specified data matrix (normally transformed and/or untransformed data matrix) to find subsets of variables (or species) that best 'fit' the multivariate pattern of a separately specified resemblance matrix. In other words, it identified a subset (or subsets) of variables within one data set that produces the most similar (highest correlation) pattern to the overall multivariate pattern of another data set. From a random starting point the analysis adds and removes variables from the initial data sets and assesses whether these improve or worsen the match to the second data set overall. Once the best match is achieved analysis is terminated. The results depend somewhat upon the starting point of the analysis and the test is therefore always run with multiple restarts in order to ensure that the best fit is found.

Since BVSTEP may be used to compare any two similarly structured data sets it has a variety of applications. These include Bio-Env tests (where the subset of environmental variables that best fit or 'explain' the biotic data are determined), Env-Bio tests (where the subset of species that best fit the environmental data are determined) and Bio-Bio tests (where a subset or subsets of species that most resemble the overall multivariate biotic pattern are determined). The results of these analyses may provide valuable insight into the processes affecting species distributions in survey areas.

*ANOSIM*

ANOSIM is a multivariate equivalent of an ANOVA test. It is applied to a priori structured data sets to test for differences between pre-selected groups of samples or stations. For instance, ANOSIM may be used to test whether the fauna found <1km of an offshore installation differs from that found at >1km. The result of such an analysis might provide an indication of whether the installation and operation of offshore facilities has affected the benthic community. Results of ANOSIM tests are given as r values that range from 0 (no difference) to 1 (highly different), and the significance is determined by comparison to the randomly permuted distribution of the samples included in the analysis.

*SIMPER*

Where differences between groups of samples are found, SIMPER may be used to interpret which species, or environmental variables, are principally responsible for the differences between the groups and which are most responsible for the similarities within groups. The SIMPER analysis decomposes differences between all pairs of sample, one from each identified group, into their contributions from each species or variable, and ranks them in decreasing order of their contribution to overall dissimilarity.

*RELATE*

The RELATE test of PRIMER calculates the rank similarity of two specified data matrices, so, for instance, may be used to provide an indication of the effect of the removal of a subset of taxa (*e.g.*, juveniles) on the structure of the data set overall.

### D.10.4 Spearman's Rank Correlation

Spearman's Rank Correlation Co-efficient is a non-parametric correlation analysis that may be used to test for relationships between environmental variables. Significant relationships indicate that environmental variables vary similarly. Large numbers of significant correlations might suggest the presence of an environmental gradient, that in the absence of obvious natural changes in the environment (such a depth gradient), may be attributable to point source pollution or some other form of anthropogenic interference. A matrix of Spearman's rank correlation coefficients, comparing many of the environmental variables, was calculated using Microsoft Excel and is presented in Appendix H.

### D.10.5 Dixon's test for Outliers

Within the data set of environmental variables, one or more values may differ considerably from the majority of the rest. In order to identify such values for investigation as to whether they are deviant results or indicative of a notable trend at seabed, Dixon's Q-test for outliers may be used for data sets of five to 25 samples. The test assumes a normal distribution.

The Dixon's Q-test is performed by taking the difference of the highest (or lowest) value and the value nearest to it and dividing this by the range of the data for that variable. The results of the Dixon's test for both high and low outliers was calculated using Microsoft Excel and is presented in Appendix H.

## D.11 EUNIS Habitat Classification

Habitat classification is used to identify different habitats and biotopes based on the biotic and abiotic features of the seabed. Habitat and biotope classifications were conducted on the available survey data, adhering to protocols within the European Union Nature Identification System (EUNIS). The system was developed between 1996 and 2001 by the European Environment Agency (EEA) in collaboration with European experts. The table below gives examples of the five EUNIS levels used to describe the marine environments.

# APPENDIX D METHODS

Table D.6 Example EUNIS Habitat Classification Levels

| | Detail Covered (EUNIS code) |
|---|---|
| 1. Environment | Marine benthic habitats (M) |
| 2. Broad habitats | Circalittoral biogenic habitat (MC2) |
| 3. Main habitats | Atlantic circalittoral biogenic habitat (MC22) |
| 4. Biotope complexes | Worm reefs in the Atlantic circalittoral zone (MC221) |
| 5. Biotopes | *Sabellaria spinulosa* on stable Atlantic circalittoral mixed sediment (MC2211) |

Development of the EUNIS classification comes from both a top-down and a bottom-up approach. The first division is based on differentiating between major biological zones related to depth (littoral down to abyssal) and differentiation of substrate type *(e.g.* rock, sand, gravel). These high-level divisions can be further subdivided based on the main biogeographical regions of Europe's seas (*e.g.* Arctic, Baltic, Atlantic) with these regional splits being based on a combination of salinity and temperature. Such broad-scale differences in habitat character are readily understood by non-specialists and provide classification types that are easily mapped. However, they also have ecological relevance as they reflect major changes in habitat character upon which species distribution depends (Connor *et al.*, 2004).

Bottom-up classification differentiates between places with different species communities. Relative species composition, diversity and abundance vary from place to place and are dependent both on environmental characteristics and upon interactions between species. Surveyed sites with similar environmental characteristics, such as sediment type and depth, show certain levels of similarity in their species communities.

# APPENDIX E BACKGROUND INFORMATION

## E.1 Sediment Characteristics

Particle size distributions of sediments in the marine environment are to a large extent determined by hydrodynamic energy at the sediment water interface. Strong currents tend to scour the seabed thereby resuspending fine particles and any material associated with them, whilst the finest sediments predominate in areas with the least hydrodynamic energy.

The role of sediment in the transport and retention of chemical pollutants is tied to both particle size and to the amount of particulate organic carbon associated with the sediment. The chemically active fraction of sediment is usually cited as the organic component and the finest size fractions (smaller than 63µm, silt, clay). The sediment, in particular the organic carbon and finer fractions, acts as a sink for many of the persistent compounds, including metals, hydrocarbons and chlorinated compounds. Many of these persistent substances are also inherently bioaccumulative and toxic. The concentrations of many parameters are typically positively correlated with the proportion of fines found in the sediment as a result of fine particles possessing a relatively large surface area. Fine sediment particles are relatively easily resuspended by waves and currents, and may be transported, along with the materials sorbed to them, over large distances, finally being deposited in areas of lower hydrodynamic energy.

Generally speaking, sands and coarser grained materials are often organically deficient. Strong currents have a tendency to resuspend fine materials and their associated organic matter. Therefore, in an environment that is not nutrient enriched due to anthropogenic discharges, both total organic matter and total organic carbon will normally be lowest at sites with coarse-grained sediment, where currents are often strongest.

Sediment particle size and organic content are also critical measurements for the categorisation of habitat type since to a large extent they control which organisms are capable of living within sediments. Most benthic infaunal organisms exhibit preferences for sediment with particular grain size characteristics. Many organisms live in tubes or burrows constructed from sediment particles; each organism's ability to do this may be limited by the range of different sized particles available. The distribution and abundance of free-living mobile organisms, *i.e.*, those that do not construct tubes or burrows, are also affected by particle sizes, which influence their ability to move within the sediment. Sand grains of inappropriate sizes may be too big to move or, conversely, too small to be stable.

Feeding guilds are groupings of organisms based upon the feeding strategies they employ (United States Environmental Protection Agency or US EPA, 2008) and, as such, sediment particle size and organic content can greatly affect which species guilds may dominate in any given area. Many deposit feeding organisms, which process sediment through the alimentary tract to obtain nutrition (Gage & Tyler, 1992), are highly selective of the grain sizes that they will ingest, often preferring finer sediments that possess relatively high organic content. Conversely, resuspension of fine particulate matter may clog delicate filtering apparatus used by suspension feeders to obtain their suspended food particles from seawater (Gibson *et al.*, 2005), resulting in their exclusion from muddy sediments. Additionally, the mixtures of particle sizes determine the ease with which water and oxygen move through the sediment. An abundance of fine particles in a stable environment may lead to the formation of substrata with small interstitial spaces through which oxygen diffusion can be restricted. This may lead to anoxic conditions within the sediment, which further affects the range of species that may be present. Determination of sediment particle sizes and organic content is therefore of critical importance to the interpretation of benthic environmental survey data.

## E.2 Sediment Hydrocarbons

The principal sources of hydrocarbons in the marine environment are anthropogenic (McDougall, 2000). However, contamination of the marine environment with crude oils is not a recent phenomenon, nor solely attributable to anthropogenic activities (Douglas *et al.*, 1981). Three general processes can add hydrocarbons to marine environments: biosynthetic, geochemical and anthropogenic (McDougall, 2000).

Oil is a complex mixture of hydrocarbons and other organic compounds. Hydrocarbons are the principal component of oil, usually contributing >75% of the constituents (Laflamme & Hites, 1978). Petroleum hydrocarbons can be divided into the following broad classes according to their structure: saturates (alkanes, isoalkanes and cycloalkanes), olefins (alkenes), aromatics (benzene, toluene, ethylbenzene and xylenes, or BTEX, and polycyclic aromatic hydrocarbons), asphaltenes, polar compounds and resins (Leahy & Colwell, 1990; Wang & Fingas, 2005).

Due to the complex and variable composition of oil in marine sediments, quantification of total hydrocarbons, groups of hydrocarbons and individual hydrocarbons is required to allow identification of the source of oil within the sediments, be it anthropogenic, biogenic or geochemical. The OSPAR (2017) guidelines for monitoring the environmental impact of offshore oil and gas activities recommend the following analyses to be conducted for environmental surveys (including baseline surveys): total hydrocarbon (THC) concentration, unresolved complex mixture (UCM) concentration, individual and total n-alkane concentrations, pristane and phytane concentrations; individual and total 2-6 ring polycyclic aromatic hydrocarbon (PAH) concentrations, and those of their respective alkyl derivatives.

*Total Hydrocarbon Concentration*
THC concentration gives an indication of the total hydrocarbon present within a sediment sample; it does not give an indication of the source of contamination. The definition of THC is wholly dependent on the analytical process utilised to quantify it. In this case, THC is equivalent to total n-alkane ($nC_{10}$ to $nC_{37}$), pristane, phytane, UCM and total PAH (all PAHs including alkylated derivatives) concentrations.

*Unresolved Complex Mixture*
The UCM consists of a large variety of branched alicyclic hydrocarbons, which are not resolved by conventional capillary gas chromatography (GC) columns and appear as a 'hump' in GC chromatograms (Bouloubassi *et al.*, 2001). These compounds remain after substantial weathering and biodegradation of petrogenic inputs has taken place, with the 'hump' becoming a more predominant feature as resolvable n-alkanes are selectively transformed by weathering. Abundant UCM is ascribed to either degraded or weathered oil residues, and therefore its occurrence in environmental samples is an indicator of oil pollution (Bouloubassi *et al.*, 2001). Notably, a UCM between $nC_{20}$ and $nC_{34}$, centred on $nC_{29}$ is typical of North Sea sediments, and is generally considered as 'North Sea Background'.

*N-alkanes*
Alkanes are the simplest aliphatic compounds, containing only carbon and hydrogen held together by single bonds and not containing a ring; they have the general formula $C_nH_{2n+2}$ (Lyons & Plisga, 2005). The n-alkanes are continuous, straight chain alkanes, while branched-chain alkanes are known as isoalkanes or isoprenoids (Lyons & Plisga, 2005). The only isoprenoids quantified in this survey are pristane and phytane, which are isomers of $nC_{18}$ and $nC_{19}$. These compounds are substantially less susceptible to weathering than their straight chain equivalents and are therefore of use when investigating the degree of weathering of a sample (Tran *et al.*, 1995).

Although generally less harmful to many living organisms than aromatic hydrocarbons, analysis of the aliphatic component (n-alkanes, pristane and phytane) can still provide valuable information to aid in the determination

of hydrocarbon sources (Tran *et al.*, 1995). N-alkanes can be derived from a variety of origins, both anthropogenic and natural; it is therefore necessary to distinguish which of these are present, or indeed predominate, in a given environment (Tran *et al.*, 1995). There is a wide range of methods available for this purpose, but those undertaken in this report include: quantification of individual n-alkane concentrations, interpretation of GC chromatograms, the carbon preference index (CPI; Farrington & Tripp, 1977) and the pristane:phytane ratio (Berthou & Friocourt, 1981).

*Polycyclic Aromatic Hydrocarbons*

PAHs and their alkyl derivatives are almost ubiquitous in marine environments (Laflamme & Hites, 1978). Natural sources of PAHs include forest fires (Youngblood & Blumer, 1975), synthesis by plants (Neff, 1979) and oil seeps (Page *et al.*, 1998). However, the largest sources of PAHs are associated with anthropogenic activities, particularly fossil fuel combustion (Neff, 2004; Laflamme & Hites, 1978). Pyrogenic PAHs may be transported long distances through the atmosphere before finally being deposited. Even after deposition, PAHs may undergo further transport, *e.g.* in urban runoff and rivers, before ultimately being deposited in marine sediments, where they sorb to organic matter and sediment particles.

Concentrations of PAHs in marine sediments vary by many orders of magnitude, ranging from less than 1ng $g^{-1}$ in deep-water oceanic sediments up to a few mg $g^{-1}$ in highly contaminated harbours and coastal sediments (Neff, 2004). In enclosed waters subjected to oil exploration and production activity, PAH concentrations tend to be somewhat higher than in the open ocean. Generally speaking, the greatest PAH concentrations are found in coastal sediments. Barring the presence of point sources of hydrocarbon contamination, total PAH concentrations in marine sediments normally decrease with distance from major human population centres (Larsen *et al.*, 1986).

The occurrence and concentration of PAHs in the environment is of concern since many possess mutagenic, carcinogenic and toxic properties (McDougall, 2000; Neff, 2004). Many PAHs are readily bioaccumulated through the food web and higher weight aromatics in particular are persistent. The rate at which PAHs degrade is affected by many factors; in the marine environment photooxidation and biodegradation are considered to be the two most important processes of degradation (Neff, 2004). Therefore, PAHs are likely to be most persistent in cold, high latitude deep-waters where sediments receive little or no light. ESGOSS (1994) estimate the half-lives of 2-ring aromatics to be generally less than 100 days whilst heavier weight 5- and 6-ring aromatics may possess half lives in excess of 10,000 days.

Although found in most marine sediments, petrogenic aromatics are normally less abundant than the pyrogenic, HMW aromatics (Bence *et al.*, 1996). Elevated concentrations of LMW, more volatile, 2 and 3 ring PAHs (naphthalenes, phenanthrenes and dibenzothiophenes; NPD) may often be related to the presence of point sources of hydrocarbon input, including oil spills, natural seeps, drilling activity and produced water outfalls (Neff, 2004). A major source of NPD PAHs is the use of oil-based muds during drilling operations and the subsequent discharge of these cuttings on the seabed (Breuer *et al.*, 2004). Pyrogenic PAHs tend to be more widespread, but generally in relatively low concentrations.

The concentrations at which individual PAHs produce toxic effects vary widely (Long *et al.*, 1995) and are dependent on their type and bioavailability. Values for the toxicity of individual aromatics may be misleading since individual PAHs are rarely found in isolation. The best estimates of the potential toxicity of PAHs in marine sediments are ERL and ERM concentrations for total LMW, total HMW and total PAHs (Neff, 2004). Long *et al.* (1995) gives ERL concentrations for LMW and HMW PAHs of 0.55 and 1.70µg $g^{-1}$, respectively. ERM concentrations are 3.16 and 9.60µg $g^{-1}$ for LMW and HMW PAHs, respectively. The ERL and ERM concentrations for total PAH concentration in sediments are 4.022 and 44.792µg $g^{-1}$, respectively. These concentrations are not actual thresholds of toxicity, but delineate concentration ranges with associated probabilities of toxicity. The ERL is the tenth percentile in the PAH effects data provided by Long *et al.* (1995),

while the ERM is the median, or 50th percentile. Concentrations below the ERL concentration therefore represent a range in which effects would rarely be observed; concentrations equal to or above the ERL concentration, but below the ERM concentration, represent a range in which effects would occasionally occur and concentrations equalling or exceeding the ERM concentration represent a range within which effects could frequently be expected.

The US EPA identified 16 priority low and higher molecular weight PAHs. Nine of these were selected by OSPAR as the focus for their studies and are the 4 to 6 ring compounds of particular importance due to their toxic nature even at very low concentrations. OSPAR CEMP EAC benchmark concentrations (OSPAR, 2009c) have been developed for the nine OSPAR priority PAHs plus naphthalene and dibenzothiophenes (DBT).

Information on the source of PAHs in sediments may be obtained from a study of the alkyl homologues (*e.g.* methyl, ethyl etc. substitution) and parent compound distributions and concentrations. Sediments contaminated with petrogenic material normally contain a predominance of alkylated PAHs, particularly within the LMW range, whereas pyrogenic PAHs comprise mostly HMW unalkylated parent compounds.

## E.3 Sediment Metal Concentrations

Metals are generally persistent and at elevated concentrations most are toxic to varying degrees. Many metals such as copper, zinc and chromium are readily bioaccumulated meaning that they are absorbed and stored in organisms over time leading to potential high concentrations capable of causing lethal and sub-lethal toxic effects in benthic organisms even when found in apparently low concentrations in sediment. Metal concentrations in uncontaminated marine sediments generally exceed those found in overlying seawater by three to five orders of magnitude (Bryan & Langston, 1992), since the buffering effects of saline water cause many metals to be rapidly precipitated. Furthermore, dissolved metals are readily scavenged from the water column by organic coatings and iron and manganese coatings found on the surface of fine sediment particles. Consequently, fresh waters that are metal enriched by terrestrial runoff tend to deposit much of their metal load in estuarine or near coastal sediments. Ecological impacts attributable to anthropogenic metal contamination in non-coastal marine environments are often somewhat limited in geographical range close to the point of their origin (Rygg, 1985).

Several metals are found in high concentrations in drilling muds and produced water. Some of these metals are added intentionally to drilling muds as metal salts or organo-metallic compounds whilst others are present as trace impurities in major mud ingredients, particularly barite and clay. Those metals most characteristic of contamination of the sediment with drilling muds or cuttings are barium, chromium, lead and zinc (Neff, 2005), but this may vary depending upon the specific constituents of the muds. By far the most abundant metal in most drilling muds is barium, found in the form of barite ($BaSO_4$). In exceptional cases, fine-grained marine sediments may naturally contain in excess of 1000µg $g^{-1}$ barium, but this figure may be greatly enhanced by contamination of sediments with drilling muds containing up to 450mg $g^{-1}$ barium (Neff, 2005). Due to its low solubility and the fact that it is not toxic in its sulphate form (Gerrard *et al.*, 1999), elevated barium concentrations are rarely of toxicological concern. However, monitoring sediment barium concentrations can provide information regarding the extent to which drill cuttings have been transported from their point of origin.

When considering the results of the sediment metal determinations it should be borne in mind that speciation (the particular forms, or species, of any given metal that exist in a sample), sediment granulometry and partitioning of metals between water and sediment phases all affect bioavailability and therefore toxicity. Even if a metal is present at above normal concentrations, it does not necessarily follow that the metal will produce ecologically deleterious effects, particularly if it is present in an insoluble or relatively low toxicity form. Historically, a wide range of different extraction techniques have been employed that were intended to provide an estimate of the concentrations of metals in marine sediments that may be available to the biota. One of the

most commonly used methods of modelling metal bioavailability is extraction of oxic (surficial) sediments with weak acids (*e.g.* 1M nitric acid) since most anthropogenic metal contaminants show a much higher affinity to fine particulate matter than the coarse fraction by the presence of organic matter and clay minerals. These techniques have been shown to produce results that correlate closely with metal burdens in the tissues of benthic organisms (Luoma & Davis, 1983; Bryan & Langston, 1992). However, the extent to which a particular method of extracting metals from sediments reflects their bioavailability is still not well understood, and the debate regarding which methods may be most appropriate is ongoing.

Total sediment metal concentrations have historically been the preferred measurement for offshore surveys. Whilst these provide little information regarding concentrations of metals that may be bioavailable, since they involve total dissolution of the sediment, they are; however, useful for comparisons between surveys and will give an indication of whether or not sediments are contaminated. There is a growing body of data that provides broad figures for the total concentrations of many metals likely to be found in uncontaminated marine sediments (see OSPAR, 2005). Baseline figures may therefore be compared to these data in order to assess whether sediments in an area may have been anthropogenically contaminated prior to any works being carried out. Where elevated concentrations of metals are found, results may be compared to existing sediment metal toxicity data in order to assess whether particular metals may be exerting a toxicological effect on benthic communities (see Buchman, 2008).

## E.4 Metabarcoding

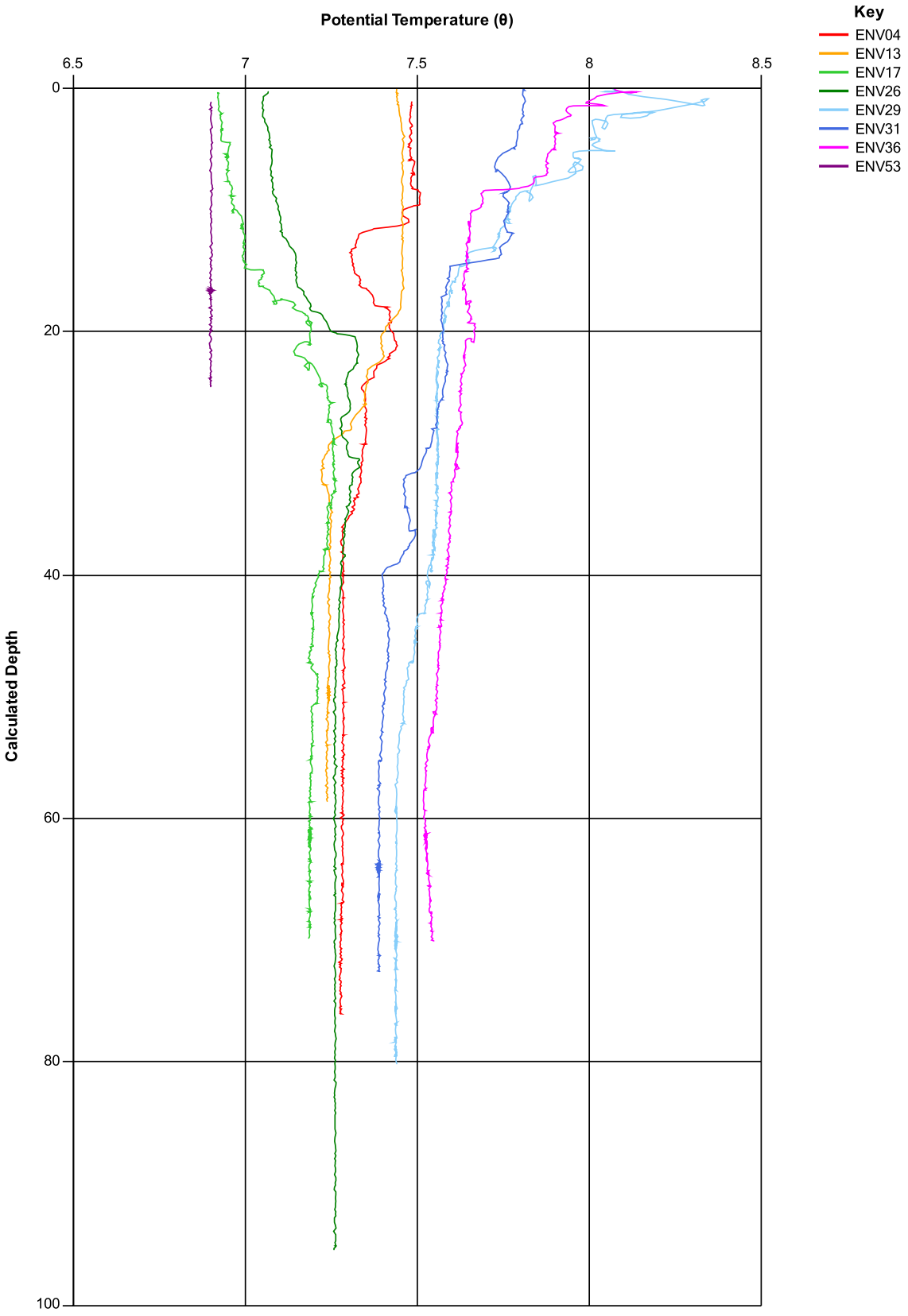
In addition to traditional methods used in this survey, sediment and water metabarcoding acts to increase assessments of important components of biodiversity that may be neglected due to the difficulty of taxonomic identification using conventional morphological approaches. DNA biodiversity monitoring provides additional information about the sediment biodiversity of the bacteria and fauna within the survey area. Bacteria are a useful indicator of water quality due to species diversity and ability to respond to changing environmental conditions (Lemke *et al.*, 1997).

## E.5 Macrofaunal Analyses

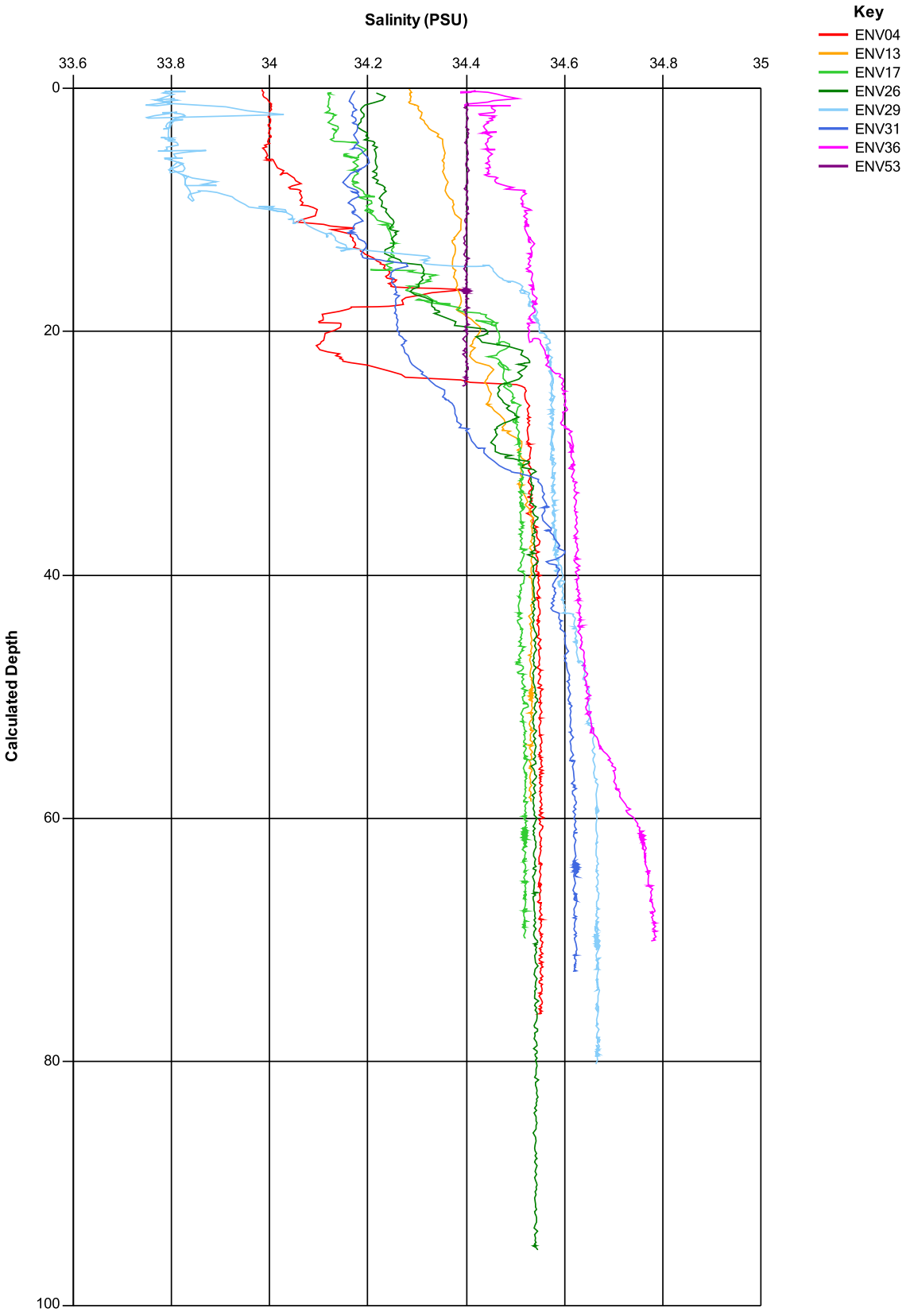
The macrofaunal investigation in this survey is designed to provide a description of the benthic infauna and how it varies across the survey area. Marine benthic invertebrate communities have been shown to be sensitive to environmental change, particularly environmental degradation as a result of anthropogenic contamination (Davies *et al.*, 1984; Warwick & Clarke, 1991). Analysis of faunal data sets may therefore provide insight into any changes resulting from point source pollutants and disturbance.

# APPENDIX F CTD PROFILES

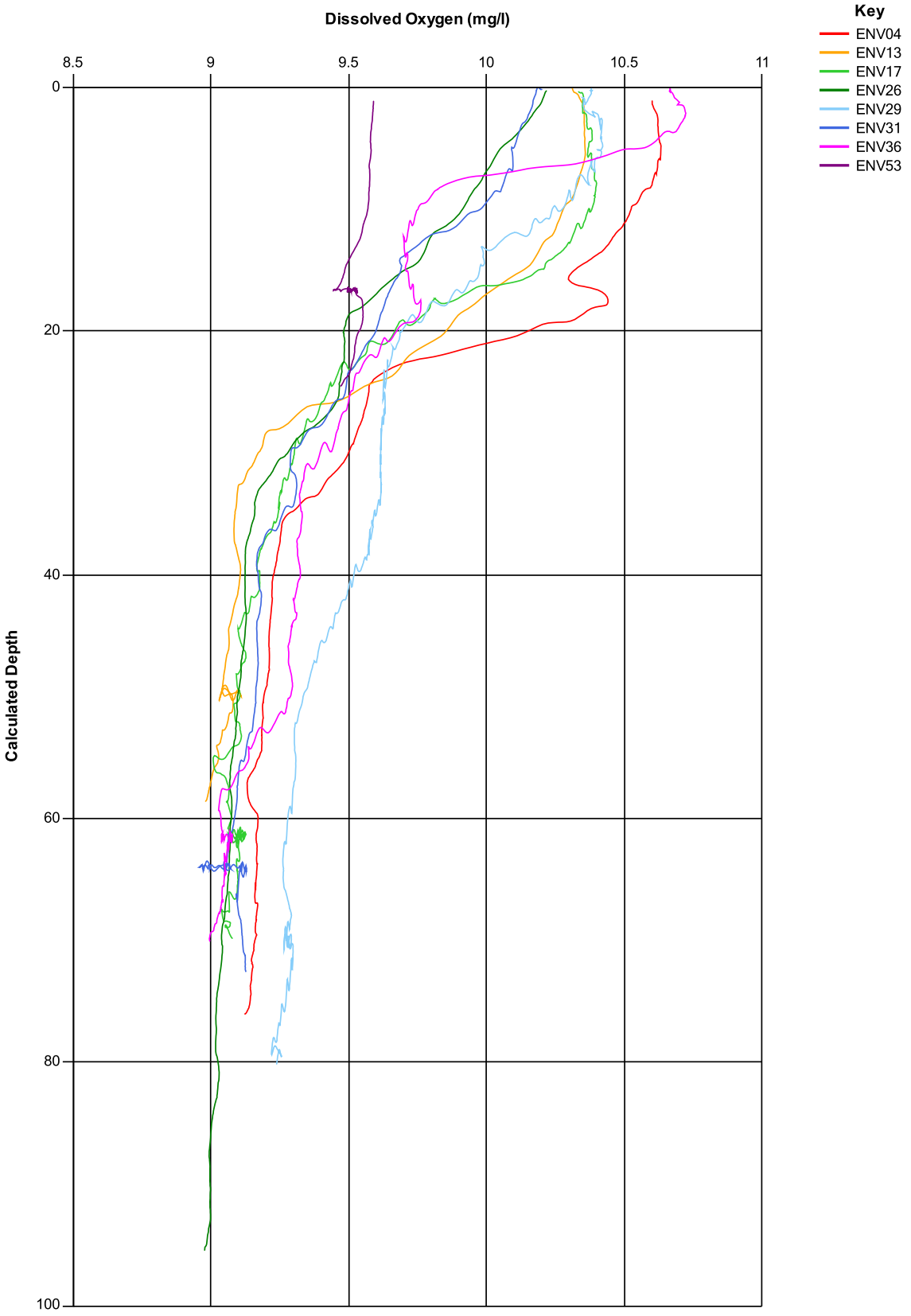
# APPENDIX F CTD PROFILES



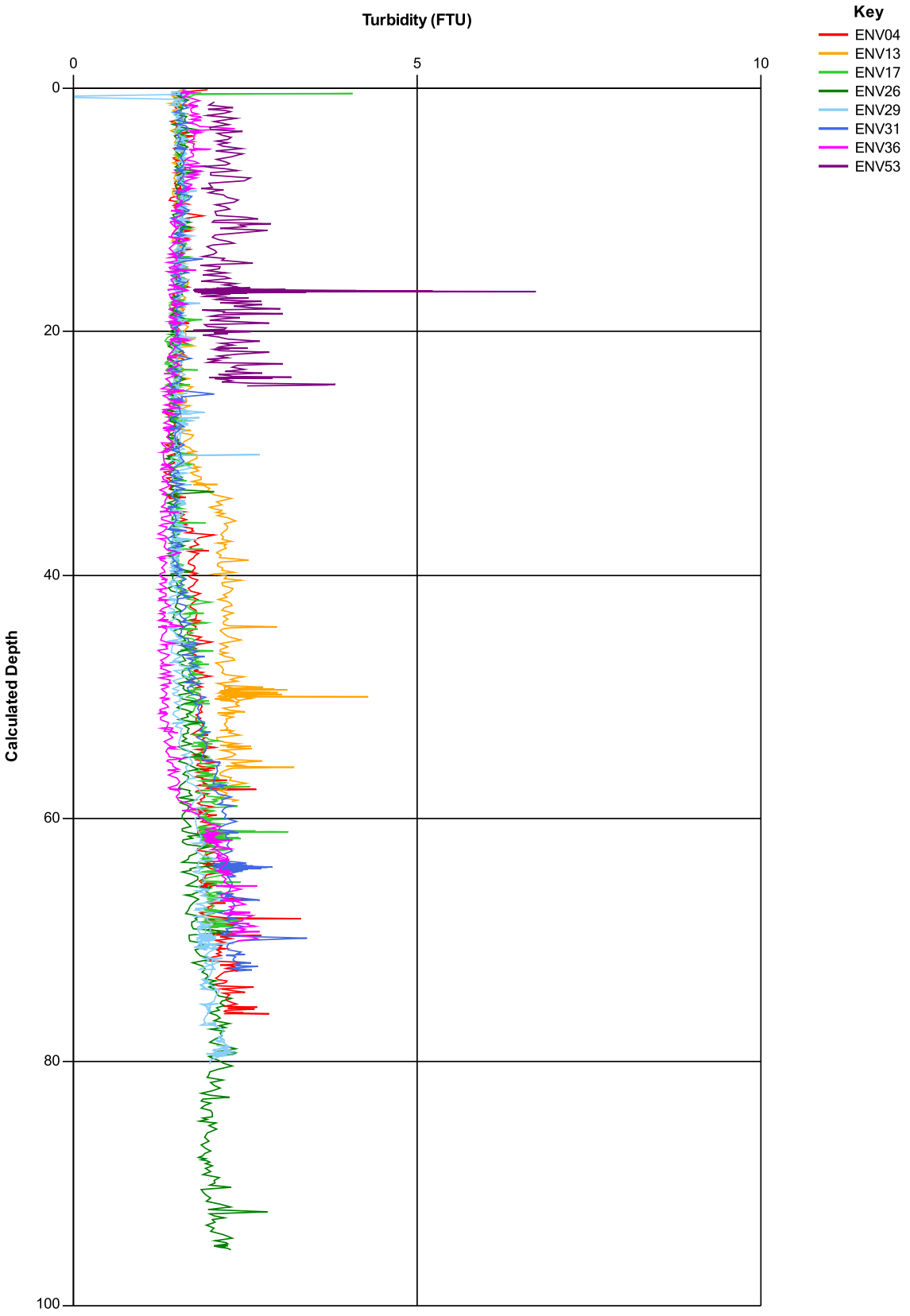
# APPENDIX F CTD PROFILES



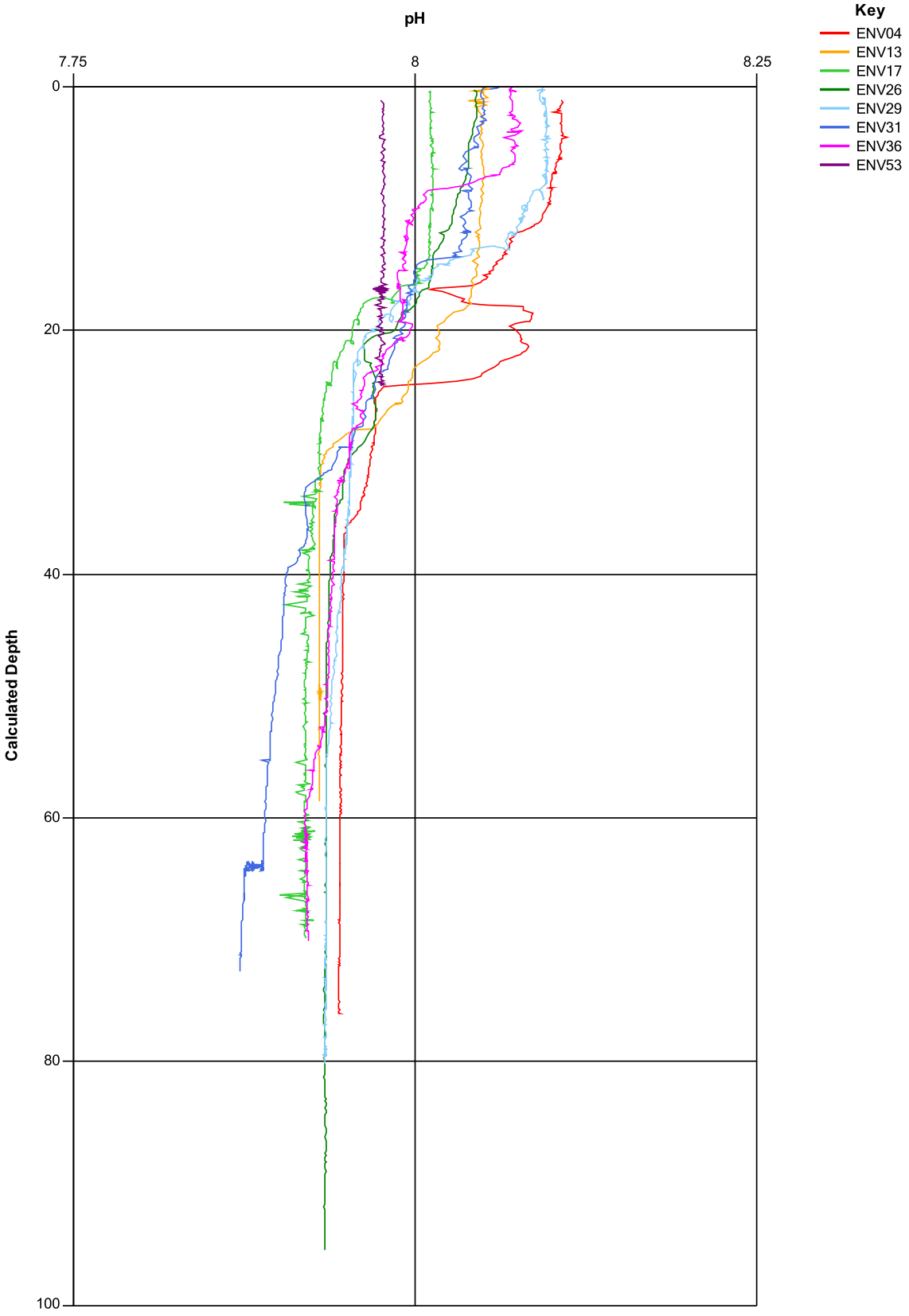
# APPENDIX F CTD PROFILES



# APPENDIX F CTD PROFILES



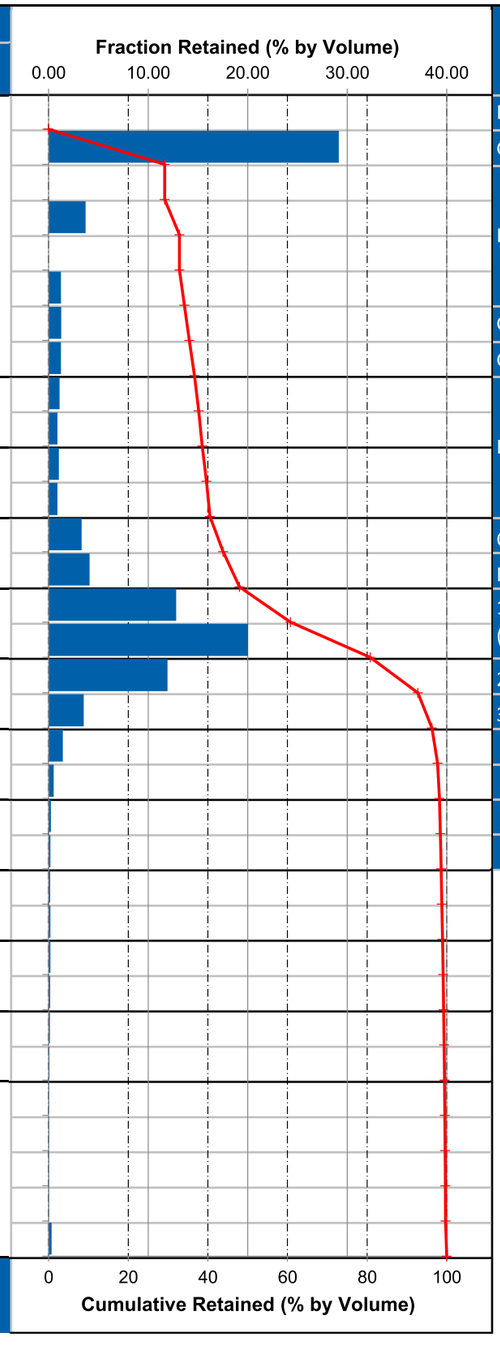
# APPENDIX F CTD PROFILES



# APPENDIX G PARTICLE SIZE ANALYSIS

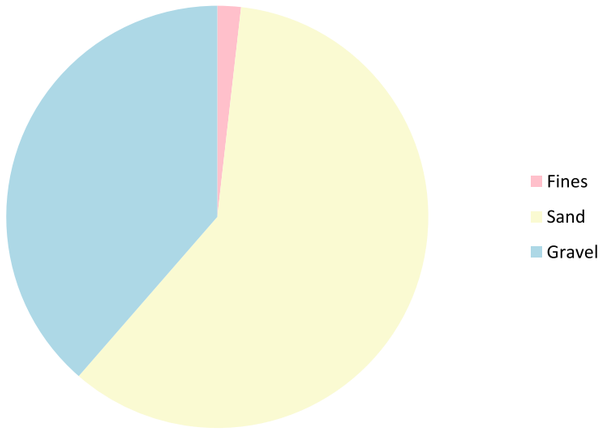
# APPENDIX G PARTICLE SIZE ANALYSIS

| ENV01 | | | | |
|---|---|---|---|---|
| Aperature (µm) | Aperature (Phi) | Percentage Fraction | Cumulative Percentage | Sediment Description |
| 45254.83 | -5.50 | 0.00 | 0.00 | |
| 32000.00 | -5.00 | 29.16 | 29.16 | |
| 22627.42 | -4.50 | 0.00 | 29.16 | |
| 16000.00 | -4.00 | 3.72 | 32.88 | Pebble |
| 11313.71 | -3.50 | 0.00 | 32.88 | |
| 8000.00 | -3.00 | 1.23 | 34.11 | |
| 5656.85 | -2.50 | 1.26 | 35.37 | |
| 4000.00 | -2.00 | 1.24 | 36.61 | |
| 2828.43 | -1.50 | 1.09 | 37.71 | Granule |
| 2000.00 | -1.00 | 0.89 | 38.59 | |
| 1414.21 | -0.50 | 1.03 | 39.63 | Very coarse sand |
| 1000.00 | 0.00 | 0.90 | 40.52 | |
| 707.11 | 0.50 | 3.31 | 43.83 | Coarse sand |
| 500.00 | 1.00 | 4.11 | 47.94 | |
| 353.55 | 1.50 | 12.81 | 60.75 | Medium sand |
| 250.00 | 2.00 | 20.03 | 80.78 | |
| 176.78 | 2.50 | 11.95 | 92.73 | Fine sand |
| 125.00 | 3.00 | 3.53 | 96.26 | |
| 88.39 | 3.50 | 1.44 | 97.70 | Very fine sand |
| 62.50 | 4.00 | 0.50 | 98.20 | |
| 44.19 | 4.50 | 0.22 | 98.41 | Coarse silt |
| 31.25 | 5.00 | 0.18 | 98.59 | |
| 22.10 | 5.50 | 0.16 | 98.75 | Medium silt |
| 15.63 | 6.00 | 0.17 | 98.92 | |
| 11.05 | 6.50 | 0.17 | 99.09 | Fine silt |
| 7.81 | 7.00 | 0.15 | 99.24 | |
| 5.52 | 7.50 | 0.13 | 99.37 | Very fine silt |
| 3.91 | 8.00 | 0.09 | 99.46 | |
| 2.76 | 8.50 | 0.07 | 99.53 | Clay |
| 1.95 | 9.00 | 0.05 | 99.58 | |
| 1.38 | 9.50 | 0.06 | 99.64 | |
| 0.98 | 10.00 | 0.06 | 99.70 | |
| <1.0 | >10 | 0.30 | 100.00 | |



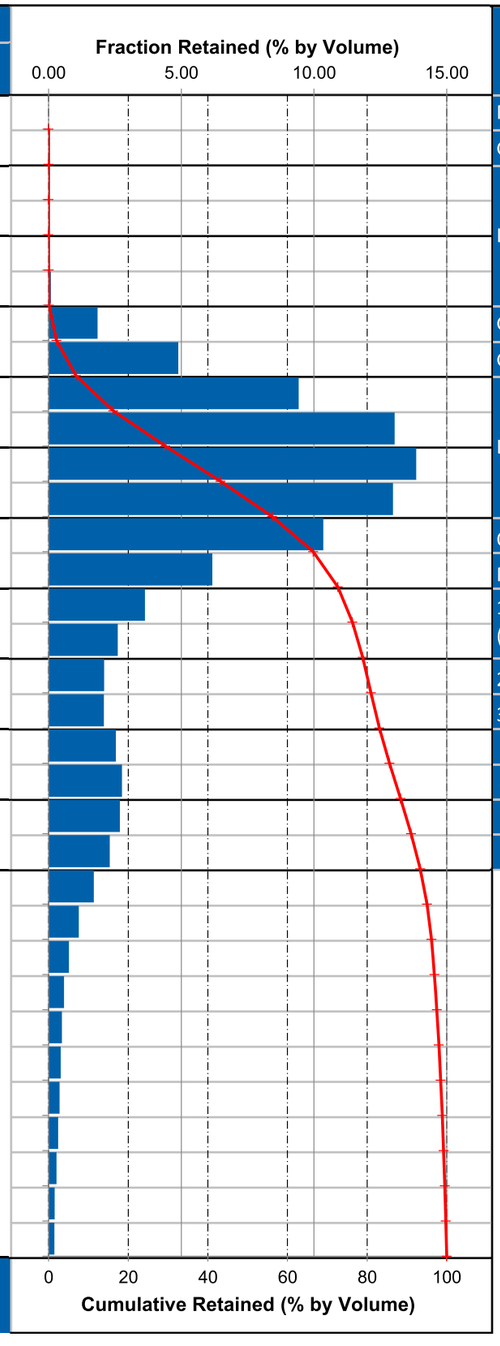

| | | | |
|---|---|---|---|
| Method of Moments | | | |
| Geometric | Mean (µm) | 1649.30 | Wentworth: |
| Logarithmic | Mean (Phi) | -0.72 | Very coarse sand |
| | Sorting | 3.39 | Very poor |
| | Skewness | -0.19 | Symmetrical |
| | Kurtosis | 2.09 | Platykurtic |
| Graphic Folk and Ward | | | |
| Geometric | Mean (µm) | 1591.29 | Wentworth: |
| Logarithmic | Mean (Phi) | -0.67 | Very coarse sand |
| | Sorting | 3.09 | Very poor |
| | Skewness | -0.65 | Very coarse |
| | Kurtosis | 0.49 | Very platykurtic |
| Other Statistics | Phi (ϕ) | µm | Wentworth: |
| Median (D50) | 1.08 | 472.88 | Medium sand |
| 1st Local Maxima (Mode) | -5.00 | 32000.00 | Pebble |
| 2nd Local Maxima | 2.00 | 250.00 | Medium sand |
| 3rd Local Maxima | -2.50 | 5656.85 | Pebble |

| Classification | | Composition | |
|---|---|---|---|
| Modified Folk | Sandy gravel | Fines | 1.80% |
| EUNIS Folk | Coarse sediments | Sand | 59.60% |
| Distribution | Multimodal | Gravel | 38.60% |



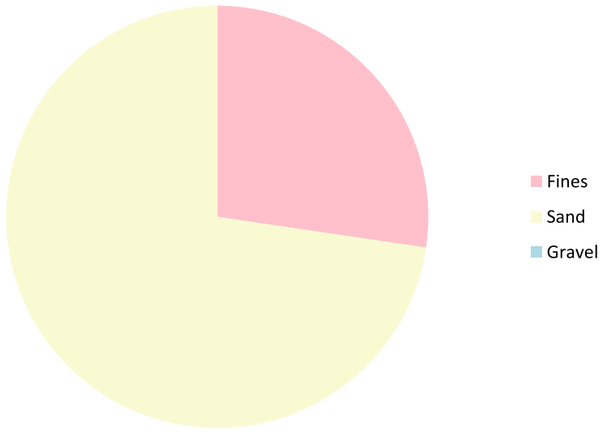
# APPENDIX G PARTICLE SIZE ANALYSIS

| ENV02 | | | | |
|---|---|---|---|---|
| Aperature (µm) | Aperature (Phi) | Percentage Fraction | Cumulative Percentage | Sediment Description |
| 5656.85 | -2.50 | 0.00 | 0.00 | Pebble |
| 4000.00 | -2.00 | 0.00 | 0.00 | |
| 2828.43 | -1.50 | 0.00 | 0.00 | Granule |
| 2000.00 | -1.00 | 0.00 | 0.01 | |
| 1414.21 | -0.50 | 0.03 | 0.04 | Very coarse sand |
| 1000.00 | 0.00 | 0.08 | 0.12 | |
| 707.11 | 0.50 | 1.84 | 1.96 | Coarse sand |
| 500.00 | 1.00 | 4.89 | 6.85 | |
| 353.55 | 1.50 | 9.42 | 16.27 | Medium sand |
| 250.00 | 2.00 | 13.04 | 29.31 | |
| 176.78 | 2.50 | 13.85 | 43.16 | Fine sand |
| 125.00 | 3.00 | 12.98 | 56.14 | |
| 88.39 | 3.50 | 10.35 | 66.48 | Very fine sand |
| 62.50 | 4.00 | 6.17 | 72.65 | |
| 44.19 | 4.50 | 3.63 | 76.29 | Coarse silt |
| 31.25 | 5.00 | 2.60 | 78.89 | |
| 22.10 | 5.50 | 2.09 | 80.98 | Medium silt |
| 15.63 | 6.00 | 2.08 | 83.06 | |
| 11.05 | 6.50 | 2.53 | 85.60 | Fine silt |
| 7.81 | 7.00 | 2.76 | 88.36 | |
| 5.52 | 7.50 | 2.68 | 91.04 | Very fine silt |
| 3.91 | 8.00 | 2.30 | 93.34 | |
| 2.76 | 8.50 | 1.70 | 95.05 | Clay |
| 1.95 | 9.00 | 1.13 | 96.18 | |
| 1.38 | 9.50 | 0.76 | 96.94 | |
| 0.98 | 10.00 | 0.58 | 97.52 | |
| 0.69 | 10.50 | 0.50 | 98.02 | |
| 0.49 | 11.00 | 0.45 | 98.47 | |
| 0.35 | 11.50 | 0.41 | 98.89 | |
| 0.24 | 12.00 | 0.36 | 99.25 | |
| 0.17 | 12.50 | 0.30 | 99.55 | |
| 0.12 | 13.00 | 0.23 | 99.78 | |
| <0.12 | >13 | 0.22 | 100.00 | |



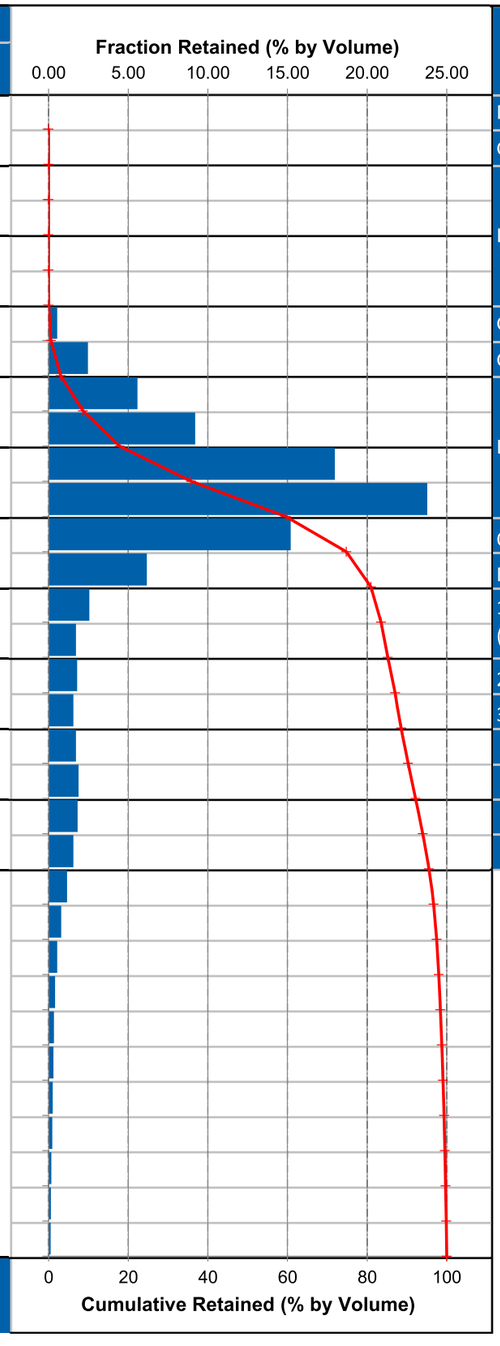

| | | | |
|---|---|---|---|
| Method of Moments | | | |
| Geometric | Mean (µm) | 88.44 | Wentworth: |
| Logarithmic | Mean (Phi) | 3.50 | Very fine sand |
| | Sorting | 2.46 | Very poor |
| | Skewness | 1.39 | Very fine |
| | Kurtosis | 4.69 | Leptokurtic |
| Graphic Folk and Ward | | | |
| Geometric | Mean (µm) | 89.73 | Wentworth: |
| Logarithmic | Mean (Phi) | 3.48 | Very fine sand |
| | Sorting | 2.34 | Very poor |
| | Skewness | 0.47 | Very fine |
| | Kurtosis | 1.26 | Leptokurtic |
| Other Statistics | Phi (ϕ) | µm | Wentworth: |
| Median (D50) | 2.76 | 147.25 | Fine sand |
| 1st Local Maxima (Mode) | 2.50 | 176.78 | Fine sand |
| 2nd Local Maxima | 7.00 | 7.81 | Fine silt |
| 3rd Local Maxima | - | - | - |

| Classification | | Composition | |
|---|---|---|---|
| Modified Folk | Muddy sand | Fines | 27.30% |
| EUNIS Folk | Mud and sandy mud | Sand | 72.60% |
| Distribution | Bimodal | Gravel | 0.00% |



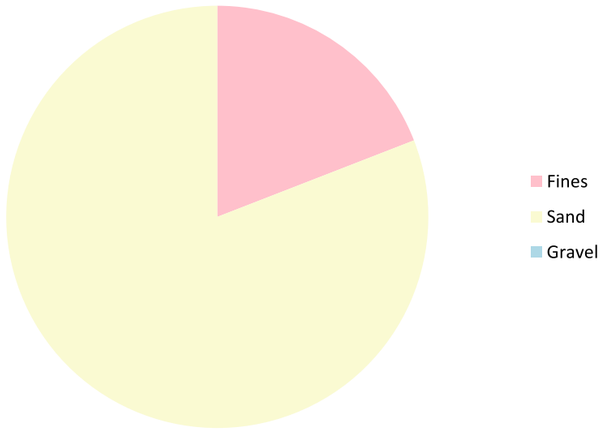
# APPENDIX G PARTICLE SIZE ANALYSIS

| ENV03 | | | | |
|---|---|---|---|---|
| Aperature (µm) | Aperature (Phi) | Percentage Fraction | Cumulative Percentage | Sediment Description |
| 5656.85 | -2.50 | 0.00 | 0.00 | Pebble |
| 4000.00 | -2.00 | 0.00 | 0.00 | |
| 2828.43 | -1.50 | 0.00 | 0.00 | Granule |
| 2000.00 | -1.00 | 0.00 | 0.00 | |
| 1414.21 | -0.50 | 0.01 | 0.01 | Very coarse sand |
| 1000.00 | 0.00 | 0.02 | 0.03 | |
| 707.11 | 0.50 | 0.54 | 0.57 | Coarse sand |
| 500.00 | 1.00 | 2.47 | 3.04 | |
| 353.55 | 1.50 | 5.57 | 8.62 | Medium sand |
| 250.00 | 2.00 | 9.21 | 17.83 | |
| 176.78 | 2.50 | 17.98 | 35.80 | Fine sand |
| 125.00 | 3.00 | 23.78 | 59.58 | |
| 88.39 | 3.50 | 15.20 | 74.78 | Very fine sand |
| 62.50 | 4.00 | 6.16 | 80.94 | |
| 44.19 | 4.50 | 2.56 | 83.50 | Coarse silt |
| 31.25 | 5.00 | 1.71 | 85.21 | |
| 22.10 | 5.50 | 1.80 | 87.01 | Medium silt |
| 15.63 | 6.00 | 1.56 | 88.56 | |
| 11.05 | 6.50 | 1.72 | 90.28 | Fine silt |
| 7.81 | 7.00 | 1.88 | 92.16 | |
| 5.52 | 7.50 | 1.81 | 93.98 | Very fine silt |
| 3.91 | 8.00 | 1.55 | 95.53 | |
| 2.76 | 8.50 | 1.16 | 96.69 | Clay |
| 1.95 | 9.00 | 0.79 | 97.48 | |
| 1.38 | 9.50 | 0.54 | 98.02 | |
| 0.98 | 10.00 | 0.40 | 98.42 | |
| 0.69 | 10.50 | 0.34 | 98.76 | |
| 0.49 | 11.00 | 0.30 | 99.06 | |
| 0.35 | 11.50 | 0.26 | 99.33 | |
| 0.24 | 12.00 | 0.23 | 99.55 | |
| 0.17 | 12.50 | 0.18 | 99.73 | |
| 0.12 | 13.00 | 0.14 | 99.87 | |
| <0.12 | >13 | 0.13 | 100.00 | |



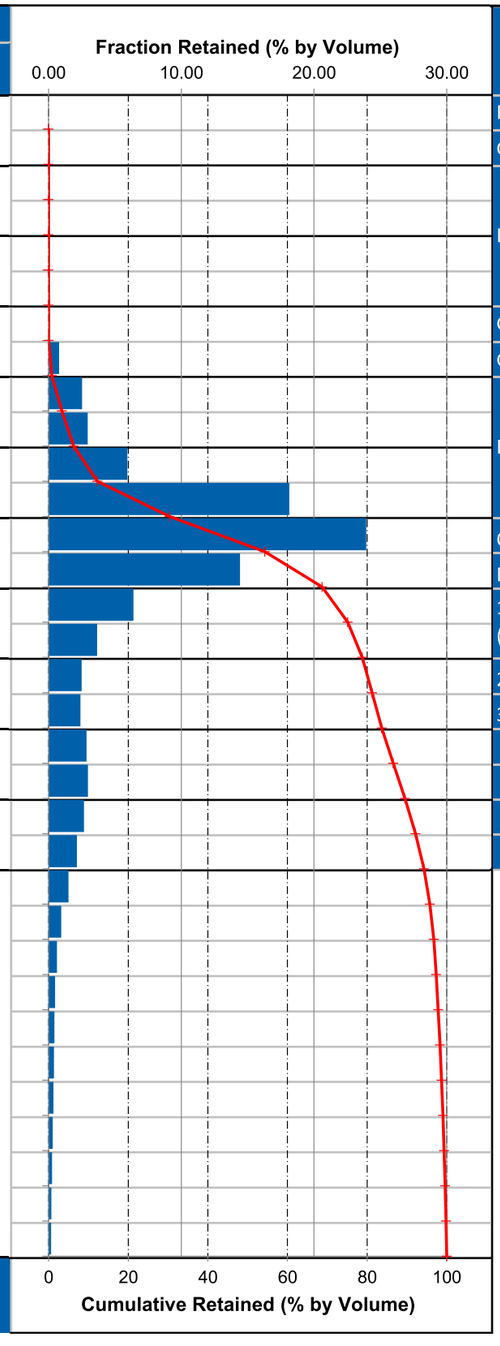

| | | | |
|---|---|---|---|
| Method of Moments | | | |
| Geometric | Mean (µm) | 99.56 | Wentworth: |
| Logarithmic | Mean (Phi) | 3.33 | Very fine sand |
| | Sorting | 2.02 | Very poor |
| | Skewness | 1.93 | Very fine |
| | Kurtosis | 7.19 | Leptokurtic |
| Graphic Folk and Ward | | | |
| Geometric | Mean (µm) | 115.40 | Wentworth: |
| Logarithmic | Mean (Phi) | 3.12 | Very fine sand |
| | Sorting | 1.69 | Poor |
| | Skewness | 0.43 | Very fine |
| | Kurtosis | 2.07 | Very leptokurtic |
| Other Statistics | Phi (ϕ) | µm | Wentworth: |
| Median (D50) | 2.80 | 143.73 | Fine sand |
| 1st Local Maxima (Mode) | 3.00 | 125.00 | Fine sand |
| 2nd Local Maxima | 7.00 | 7.81 | Fine silt |
| 3rd Local Maxima | - | - | - |

| Classification | | Composition | |
|---|---|---|---|
| Modified Folk | Muddy sand | Fines | 19.10% |
| EUNIS Folk | Sand and muddy sand | Sand | 80.90% |
| Distribution | Bimodal | Gravel | 0.00% |



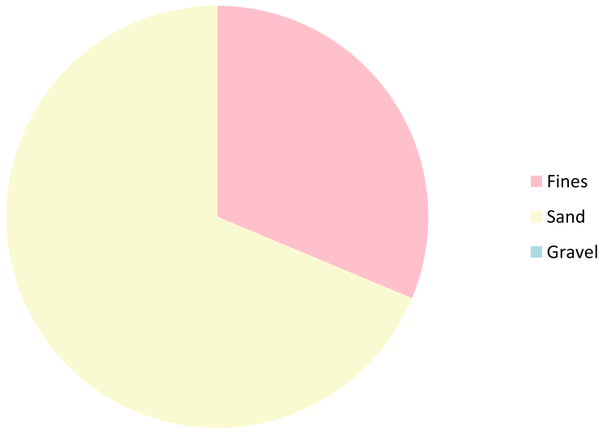
# APPENDIX G PARTICLE SIZE ANALYSIS

| ENV04 | | | | |
|---|---|---|---|---|
| Aperature (µm) | Aperature (Phi) | Percentage Fraction | Cumulative Percentage | Sediment Description |
| 5656.85 | -2.50 | 0.00 | 0.00 | Pebble |
| 4000.00 | -2.00 | 0.00 | 0.00 | |
| 2828.43 | -1.50 | 0.00 | 0.00 | Granule |
| 2000.00 | -1.00 | 0.00 | 0.00 | |
| 1414.21 | -0.50 | 0.00 | 0.00 | Very coarse sand |
| 1000.00 | 0.00 | 0.01 | 0.01 | |
| 707.11 | 0.50 | 0.02 | 0.03 | Coarse sand |
| 500.00 | 1.00 | 0.80 | 0.83 | |
| 353.55 | 1.50 | 2.52 | 3.35 | Medium sand |
| 250.00 | 2.00 | 2.95 | 6.30 | |
| 176.78 | 2.50 | 5.94 | 12.24 | Fine sand |
| 125.00 | 3.00 | 18.13 | 30.37 | |
| 88.39 | 3.50 | 23.93 | 54.30 | Very fine sand |
| 62.50 | 4.00 | 14.43 | 68.73 | |
| 44.19 | 4.50 | 6.39 | 75.12 | Coarse silt |
| 31.25 | 5.00 | 3.66 | 78.77 | |
| 22.10 | 5.50 | 2.49 | 81.27 | Medium silt |
| 15.63 | 6.00 | 2.40 | 83.67 | |
| 11.05 | 6.50 | 2.86 | 86.54 | Fine silt |
| 7.81 | 7.00 | 2.96 | 89.50 | |
| 5.52 | 7.50 | 2.67 | 92.16 | Very fine silt |
| 3.91 | 8.00 | 2.13 | 94.29 | |
| 2.76 | 8.50 | 1.49 | 95.78 | Clay |
| 1.95 | 9.00 | 0.96 | 96.73 | |
| 1.38 | 9.50 | 0.63 | 97.37 | |
| 0.98 | 10.00 | 0.49 | 97.85 | |
| 0.69 | 10.50 | 0.43 | 98.28 | |
| 0.49 | 11.00 | 0.40 | 98.68 | |
| 0.35 | 11.50 | 0.36 | 99.04 | |
| 0.24 | 12.00 | 0.32 | 99.36 | |
| 0.17 | 12.50 | 0.25 | 99.61 | |
| 0.12 | 13.00 | 0.20 | 99.81 | |
| <0.12 | >13 | 0.19 | 100.00 | |




| | | | |
|---|---|---|---|
| Method of Moments | | | |
| Geometric | Mean (µm) | 60.36 | Wentworth: |
| Logarithmic | Mean (Phi) | 4.05 | Coarse silt |
| | Sorting | 2.04 | Very poor |
| | Skewness | 1.65 | Very fine |
| | Kurtosis | 6.05 | Leptokurtic |
| Graphic Folk and Ward | | | |
| Geometric | Mean (µm) | 61.48 | Wentworth: |
| Logarithmic | Mean (Phi) | 4.02 | Coarse silt |
| | Sorting | 1.84 | Poor |
| | Skewness | 0.51 | Very fine |
| | Kurtosis | 1.62 | Very leptokurtic |
| Other Statistics | Phi (ϕ) | µm | Wentworth: |
| Median (D50) | 3.41 | 94.07 | Very fine sand |
| 1st Local Maxima (Mode) | 3.50 | 88.39 | Very fine sand |
| 2nd Local Maxima | 7.00 | 7.81 | Fine silt |
| 3rd Local Maxima | - | - | - |

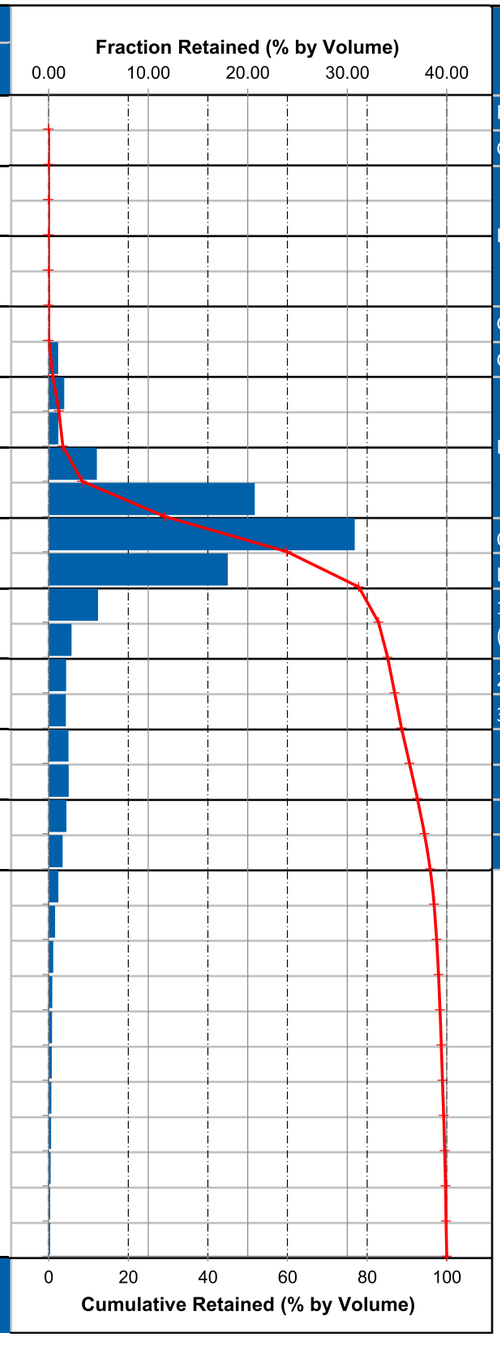
| Classification | | Composition | |
|---|---|---|---|
| Modified Folk | Muddy sand | Fines | 31.30% |
| EUNIS Folk | Mud and sandy mud | Sand | 68.70% |
| Distribution | Bimodal | Gravel | 0.00% |



# APPENDIX G PARTICLE SIZE ANALYSIS

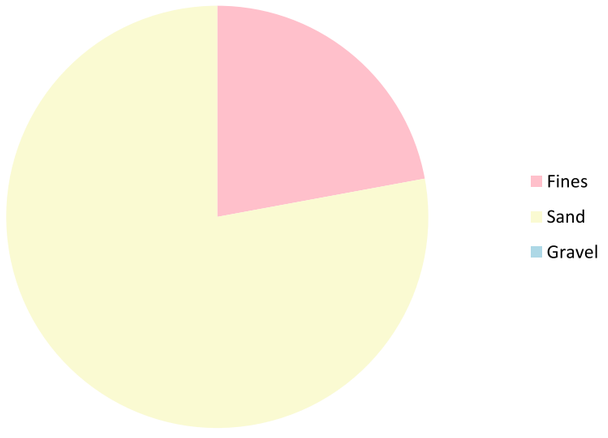
**ENV05**

| Aperature (µm) | Aperature (Phi) | Percentage Fraction | Cumulative Percentage | Sediment Description |
|---|---|---|---|---|
| 5656.85 | -2.50 | 0.00 | 0.00 | Pebble |
| 4000.00 | -2.00 | 0.00 | 0.00 | |
| 2828.43 | -1.50 | 0.00 | 0.00 | Granule |
| 2000.00 | -1.00 | 0.00 | 0.00 | |
| 1414.21 | -0.50 | 0.00 | 0.00 | Very coarse sand |
| 1000.00 | 0.00 | 0.01 | 0.01 | |
| 707.11 | 0.50 | 0.05 | 0.06 | Coarse sand |
| 500.00 | 1.00 | 0.95 | 1.01 | |
| 353.55 | 1.50 | 1.58 | 2.59 | Medium sand |
| 250.00 | 2.00 | 0.97 | 3.56 | |
| 176.78 | 2.50 | 4.86 | 8.42 | Fine sand |
| 125.00 | 3.00 | 20.71 | 29.13 | |
| 88.39 | 3.50 | 30.75 | 59.89 | Very fine sand |
| 62.50 | 4.00 | 18.00 | 77.89 | |
| 44.19 | 4.50 | 4.96 | 82.85 | Coarse silt |
| 31.25 | 5.00 | 2.29 | 85.14 | |
| 22.10 | 5.50 | 1.77 | 86.91 | Medium silt |
| 15.63 | 6.00 | 1.73 | 88.64 | |
| 11.05 | 6.50 | 2.00 | 90.64 | Fine silt |
| 7.81 | 7.00 | 2.01 | 92.65 | |
| 5.52 | 7.50 | 1.77 | 94.43 | Very fine silt |
| 3.91 | 8.00 | 1.40 | 95.83 | |
| 2.76 | 8.50 | 0.99 | 96.82 | Clay |
| 1.95 | 9.00 | 0.66 | 97.48 | |
| 1.38 | 9.50 | 0.46 | 97.94 | |
| 0.98 | 10.00 | 0.37 | 98.31 | |
| 0.69 | 10.50 | 0.34 | 98.65 | |
| 0.49 | 11.00 | 0.31 | 98.96 | |
| 0.35 | 11.50 | 0.28 | 99.24 | |
| 0.24 | 12.00 | 0.25 | 99.49 | |
| 0.17 | 12.50 | 0.20 | 99.69 | |
| 0.12 | 13.00 | 0.16 | 99.85 | |
| <0.12 | >13 | 0.15 | 100.00 | |



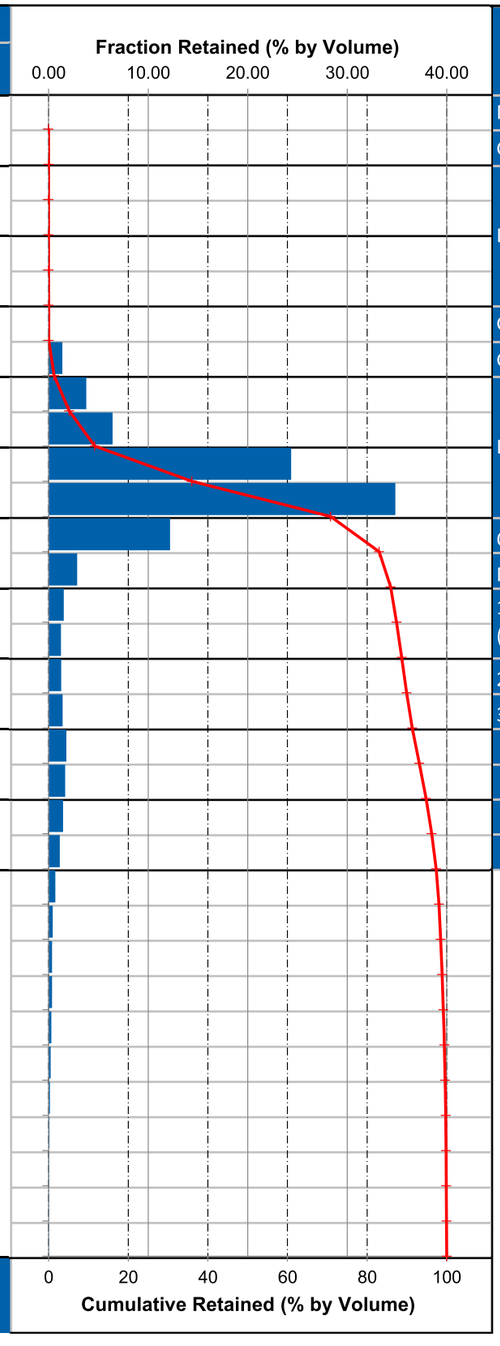

| | | | |
|---|---|---|---|
| Method of Moments | | | |
| Geometric | Mean (µm) | 70.83 | Wentworth: |
| Logarithmic | Mean (Phi) | 3.82 | Very fine sand |
| | Sorting | 1.78 | Poor |
| | Skewness | 2.21 | Very fine |
| | Kurtosis | 9.00 | Very leptokurtic |
| Graphic Folk and Ward | | | |
| Geometric | Mean (µm) | 82.98 | Wentworth: |
| Logarithmic | Mean (Phi) | 3.59 | Very fine sand |
| | Sorting | 1.36 | Poor |
| | Skewness | 0.47 | Very fine |
| | Kurtosis | 2.23 | Very leptokurtic |
| Other Statistics | Phi (ϕ) | µm | Wentworth: |
| Median (D50) | 3.34 | 98.81 | Very fine sand |
| 1st Local Maxima (Mode) | 3.50 | 88.39 | Very fine sand |
| 2nd Local Maxima | 7.00 | 7.81 | Fine silt |
| 3rd Local Maxima | 1.50 | 353.55 | Medium sand |

| Classification | | Composition | |
|---|---|---|---|
| Modified Folk | Muddy sand | Fines | 22.10% |
| EUNIS Folk | Mud and sandy mud | Sand | 77.90% |
| Distribution | Multimodal | Gravel | 0.00% |



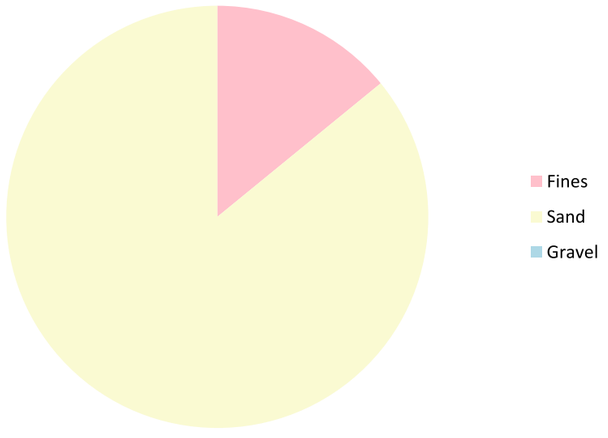
# APPENDIX G PARTICLE SIZE ANALYSIS

| ENV06 | | | | |
|---|---|---|---|---|
| Aperature (µm) | Aperature (Phi) | Percentage Fraction | Cumulative Percentage | Sediment Description |
| 5656.85 | -2.50 | 0.00 | 0.00 | Pebble |
| 4000.00 | -2.00 | 0.00 | 0.00 | |
| 2828.43 | -1.50 | 0.01 | 0.01 | Granule |
| 2000.00 | -1.00 | 0.00 | 0.01 | |
| 1414.21 | -0.50 | 0.00 | 0.01 | Very coarse sand |
| 1000.00 | 0.00 | 0.00 | 0.01 | |
| 707.11 | 0.50 | 0.00 | 0.01 | Coarse sand |
| 500.00 | 1.00 | 1.39 | 1.40 | |
| 353.55 | 1.50 | 3.78 | 5.18 | Medium sand |
| 250.00 | 2.00 | 6.42 | 11.60 | |
| 176.78 | 2.50 | 24.37 | 35.96 | Fine sand |
| 125.00 | 3.00 | 34.84 | 70.80 | |
| 88.39 | 3.50 | 12.21 | 83.01 | Very fine sand |
| 62.50 | 4.00 | 2.88 | 85.88 | |
| 44.19 | 4.50 | 1.53 | 87.41 | Coarse silt |
| 31.25 | 5.00 | 1.25 | 88.66 | |
| 22.10 | 5.50 | 1.26 | 89.93 | Medium silt |
| 15.63 | 6.00 | 1.42 | 91.34 | |
| 11.05 | 6.50 | 1.77 | 93.12 | Fine silt |
| 7.81 | 7.00 | 1.68 | 94.79 | |
| 5.52 | 7.50 | 1.45 | 96.25 | Very fine silt |
| 3.91 | 8.00 | 1.12 | 97.37 | |
| 2.76 | 8.50 | 0.68 | 98.05 | Clay |
| 1.95 | 9.00 | 0.41 | 98.46 | |
| 1.38 | 9.50 | 0.36 | 98.81 | |
| 0.98 | 10.00 | 0.34 | 99.15 | |
| 0.69 | 10.50 | 0.27 | 99.42 | |
| 0.49 | 11.00 | 0.19 | 99.61 | |
| 0.35 | 11.50 | 0.13 | 99.75 | |
| 0.24 | 12.00 | 0.09 | 99.84 | |
| 0.17 | 12.50 | 0.07 | 99.90 | |
| 0.12 | 13.00 | 0.05 | 99.95 | |
| <0.12 | >13 | 0.05 | 100.00 | |



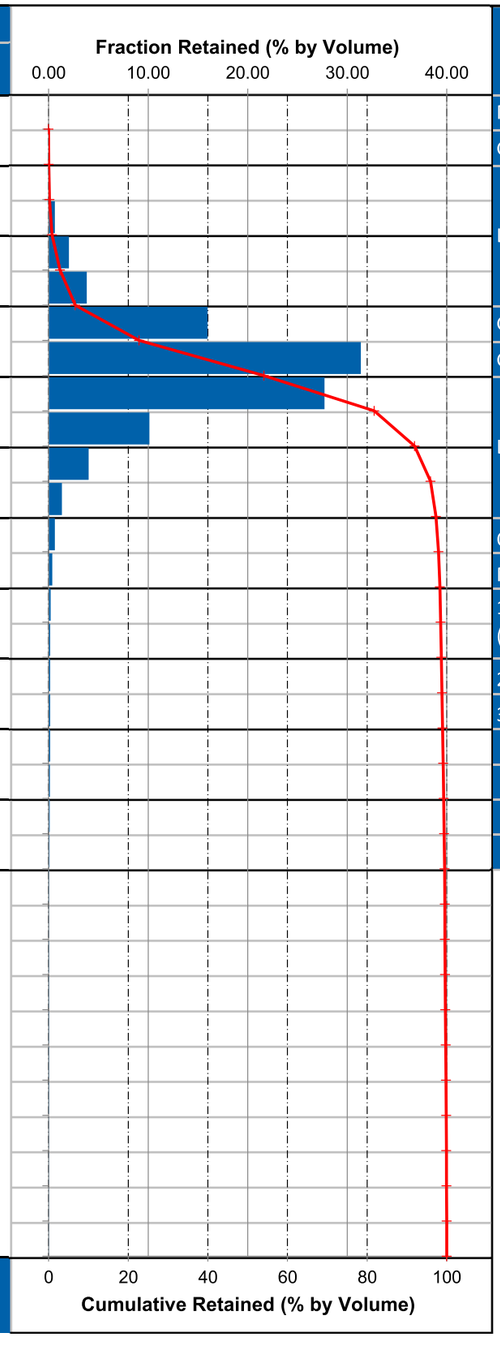

| | | | |
|---|---|---|---|
| Method of Moments | | | |
| Geometric | Mean (µm) | 114.89 | Wentworth: |
| Logarithmic | Mean (Phi) | 3.12 | Very fine sand |
| | Sorting | 1.68 | Poor |
| | Skewness | 2.37 | Very fine |
| | Kurtosis | 9.45 | Very leptokurtic |
| Graphic Folk and Ward | | | |
| Geometric | Mean (µm) | 141.45 | Wentworth: |
| Logarithmic | Mean (Phi) | 2.82 | Fine sand |
| | Sorting | 1.24 | Poor |
| | Skewness | 0.39 | Very fine |
| | Kurtosis | 2.56 | Very leptokurtic |
| Other Statistics | Phi (ϕ) | µm | Wentworth: |
| Median (D50) | 2.70 | 153.74 | Fine sand |
| 1st Local Maxima (Mode) | 3.00 | 125.00 | Fine sand |
| 2nd Local Maxima | 6.50 | 11.05 | Fine silt |
| 3rd Local Maxima | - | - | - |

| Classification | | Composition | |
|---|---|---|---|
| Modified Folk | Muddy sand | Fines | 14.10% |
| EUNIS Folk | Sand and muddy sand | Sand | 85.90% |
| Distribution | Bimodal | Gravel | 0.00% |



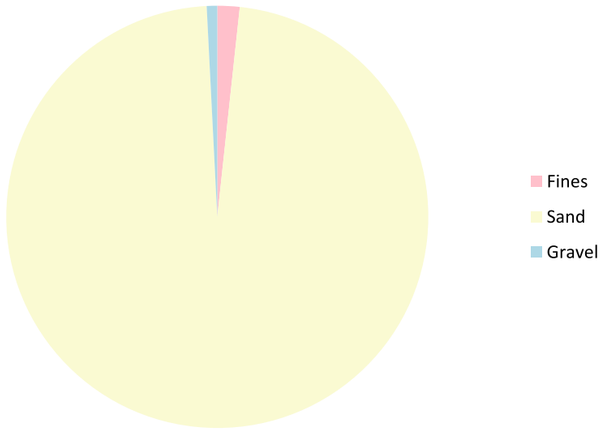
# APPENDIX G PARTICLE SIZE ANALYSIS

| ENV07 | | | | |
|---|---|---|---|---|
| Aperature (µm) | Aperature (Phi) | Percentage Fraction | Cumulative Percentage | Sediment Description |
| 5656.85 | -2.50 | 0.00 | 0.00 | Pebble |
| 4000.00 | -2.00 | 0.05 | 0.05 | |
| 2828.43 | -1.50 | 0.16 | 0.21 | Granule |
| 2000.00 | -1.00 | 0.63 | 0.84 | |
| 1414.21 | -0.50 | 2.04 | 2.88 | Very coarse sand |
| 1000.00 | 0.00 | 3.84 | 6.72 | |
| 707.11 | 0.50 | 15.99 | 22.71 | Coarse sand |
| 500.00 | 1.00 | 31.37 | 54.08 | |
| 353.55 | 1.50 | 27.71 | 81.79 | Medium sand |
| 250.00 | 2.00 | 10.12 | 91.91 | |
| 176.78 | 2.50 | 4.03 | 95.94 | Fine sand |
| 125.00 | 3.00 | 1.34 | 97.28 | |
| 88.39 | 3.50 | 0.64 | 97.92 | Very fine sand |
| 62.50 | 4.00 | 0.36 | 98.28 | |
| 44.19 | 4.50 | 0.21 | 98.49 | Coarse silt |
| 31.25 | 5.00 | 0.16 | 98.65 | |
| 22.10 | 5.50 | 0.15 | 98.80 | Medium silt |
| 15.63 | 6.00 | 0.15 | 98.95 | |
| 11.05 | 6.50 | 0.15 | 99.10 | Fine silt |
| 7.81 | 7.00 | 0.14 | 99.24 | |
| 5.52 | 7.50 | 0.12 | 99.35 | Very fine silt |
| 3.91 | 8.00 | 0.09 | 99.44 | |
| 2.76 | 8.50 | 0.06 | 99.50 | Clay |
| 1.95 | 9.00 | 0.05 | 99.55 | |
| 1.38 | 9.50 | 0.05 | 99.61 | |
| 0.98 | 10.00 | 0.06 | 99.67 | |
| 0.69 | 10.50 | 0.07 | 99.74 | |
| 0.49 | 11.00 | 0.06 | 99.80 | |
| 0.35 | 11.50 | 0.05 | 99.85 | |
| 0.24 | 12.00 | 0.05 | 99.90 | |
| 0.17 | 12.50 | 0.04 | 99.94 | |
| 0.12 | 13.00 | 0.03 | 99.97 | |
| <0.12 | >13 | 0.03 | 100.00 | |




| | | | |
|---|---|---|---|
| Method of Moments | | | |
| Geometric | Mean (µm) | 483.26 | Wentworth: |
| Logarithmic | Mean (Phi) | 1.05 | Medium sand |
| | Sorting | 1.14 | Poor |
| | Skewness | 4.22 | Very fine |
| | Kurtosis | 34.80 | Very leptokurtic |
| Graphic Folk and Ward | | | |
| Geometric | Mean (µm) | 519.52 | Wentworth: |
| Logarithmic | Mean (Phi) | 0.94 | Coarse sand |
| | Sorting | 0.72 | Moderate |
| | Skewness | 0.07 | Symmetrical |
| | Kurtosis | 1.27 | Leptokurtic |
| Other Statistics | Phi (ϕ) | µm | Wentworth: |
| Median (D50) | 0.93 | 523.06 | Coarse sand |
| 1st Local Maxima (Mode) | 1.00 | 500.00 | Coarse sand |
| 2nd Local Maxima | - | - | - |
| 3rd Local Maxima | - | - | - |

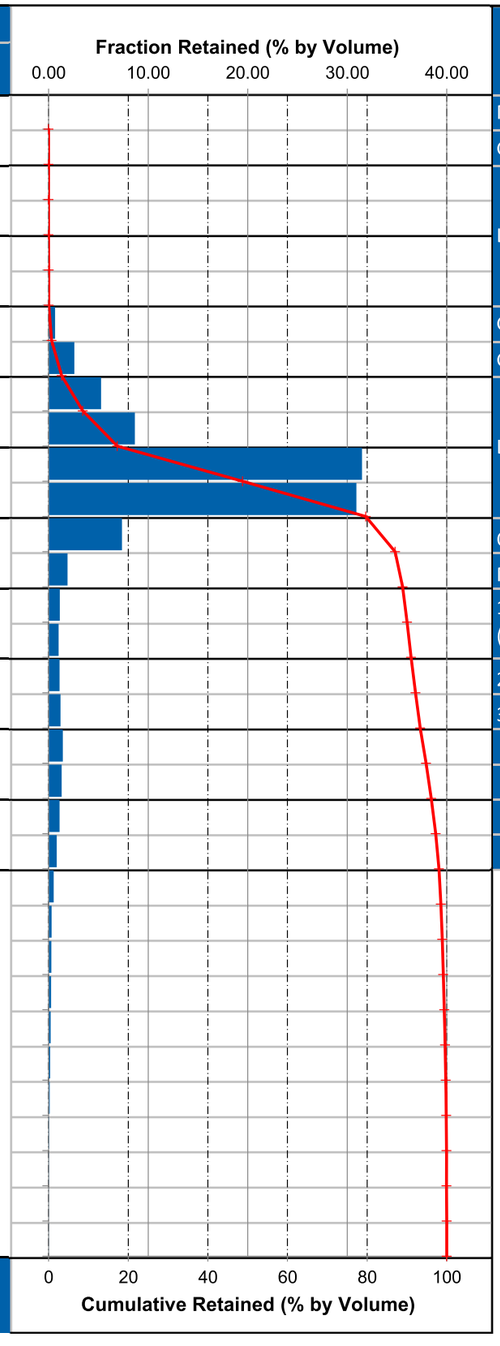
| Classification | | Composition | |
|---|---|---|---|
| Modified Folk | Sand | Fines | 1.70% |
| EUNIS Folk | Sand and muddy sand | Sand | 97.40% |
| Distribution | Unimodal | Gravel | 0.80% |



# APPENDIX G PARTICLE SIZE ANALYSIS

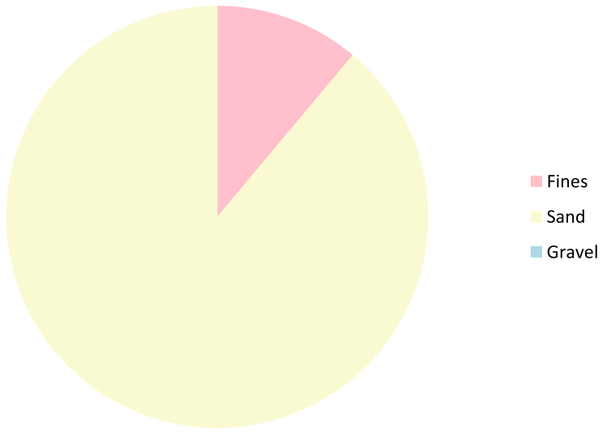
**ENV08**

| Aperature (µm) | Aperature (Phi) | Percentage Fraction | Cumulative Percentage | Sediment Description |
|---|---|---|---|---|
| 5656.85 | -2.50 | 0.00 | 0.00 | Pebble |
| 4000.00 | -2.00 | 0.00 | 0.00 | |
| 2828.43 | -1.50 | 0.00 | 0.00 | Granule |
| 2000.00 | -1.00 | 0.01 | 0.01 | |
| 1414.21 | -0.50 | 0.02 | 0.03 | Very coarse sand |
| 1000.00 | 0.00 | 0.03 | 0.06 | |
| 707.11 | 0.50 | 0.66 | 0.72 | Coarse sand |
| 500.00 | 1.00 | 2.59 | 3.31 | |
| 353.55 | 1.50 | 5.27 | 8.58 | Medium sand |
| 250.00 | 2.00 | 8.67 | 17.25 | |
| 176.78 | 2.50 | 31.48 | 48.74 | Fine sand |
| 125.00 | 3.00 | 30.92 | 79.66 | |
| 88.39 | 3.50 | 7.38 | 87.04 | Very fine sand |
| 62.50 | 4.00 | 1.89 | 88.93 | |
| 44.19 | 4.50 | 1.12 | 90.05 | Coarse silt |
| 31.25 | 5.00 | 1.01 | 91.05 | |
| 22.10 | 5.50 | 1.10 | 92.16 | Medium silt |
| 15.63 | 6.00 | 1.19 | 93.35 | |
| 11.05 | 6.50 | 1.44 | 94.79 | Fine silt |
| 7.81 | 7.00 | 1.32 | 96.11 | |
| 5.52 | 7.50 | 1.10 | 97.22 | Very fine silt |
| 3.91 | 8.00 | 0.83 | 98.04 | |
| 2.76 | 8.50 | 0.50 | 98.55 | Clay |
| 1.95 | 9.00 | 0.31 | 98.86 | |
| 1.38 | 9.50 | 0.27 | 99.13 | |
| 0.98 | 10.00 | 0.26 | 99.39 | |
| 0.69 | 10.50 | 0.21 | 99.60 | |
| 0.49 | 11.00 | 0.15 | 99.76 | |
| 0.35 | 11.50 | 0.10 | 99.86 | |
| 0.24 | 12.00 | 0.06 | 99.92 | |
| 0.17 | 12.50 | 0.04 | 99.96 | |
| 0.12 | 13.00 | 0.02 | 99.98 | |
| <0.12 | >13 | 0.02 | 100.00 | |




| | | | |
|---|---|---|---|
| Method of Moments | | | |
| Geometric | Mean (µm) | 139.71 | Wentworth: |
| Logarithmic | Mean (Phi) | 2.84 | Fine sand |
| | Sorting | 1.57 | Poor |
| | Skewness | 2.48 | Very fine |
| | Kurtosis | 10.71 | Very leptokurtic |
| Graphic Folk and Ward | | | |
| Geometric | Mean (µm) | 167.15 | Wentworth: |
| Logarithmic | Mean (Phi) | 2.58 | Fine sand |
| | Sorting | 1.16 | Poor |
| | Skewness | 0.32 | Very fine |
| | Kurtosis | 2.77 | Very leptokurtic |
| Other Statistics | Phi (ϕ) | µm | Wentworth: |
| Median (D50) | 2.52 | 174.29 | Fine sand |
| 1st Local Maxima (Mode) | 2.50 | 176.78 | Fine sand |
| 2nd Local Maxima | 6.50 | 11.05 | Fine silt |
| 3rd Local Maxima | - | - | - |

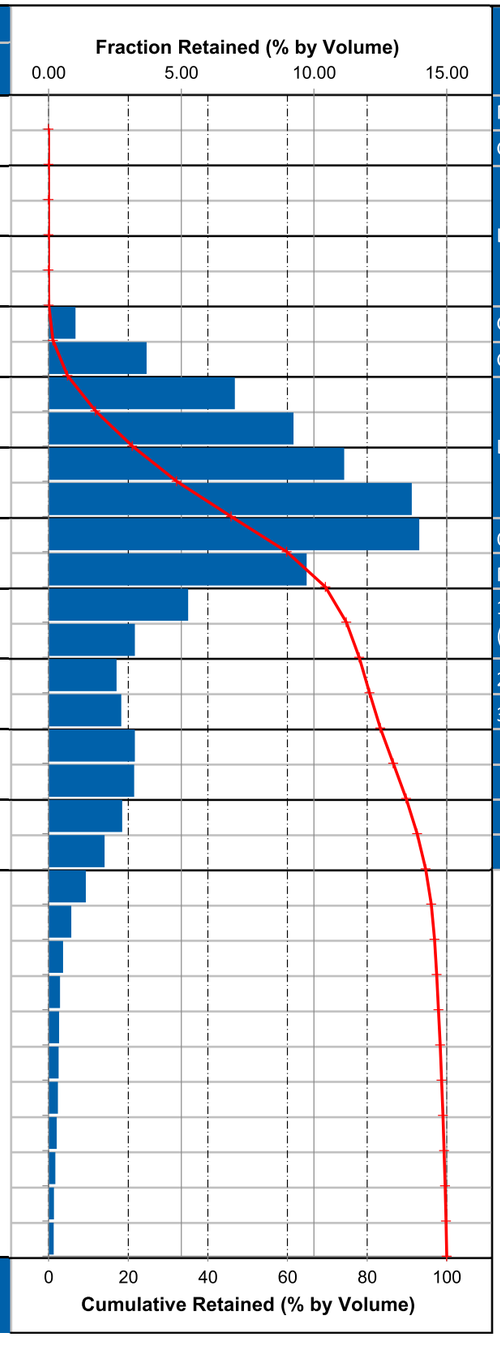
| Classification | | Composition | |
|---|---|---|---|
| Modified Folk | Muddy sand | Fines | 11.10% |
| EUNIS Folk | Sand and muddy sand | Sand | 88.90% |
| Distribution | Bimodal | Gravel | 0.00% |



# APPENDIX G PARTICLE SIZE ANALYSIS

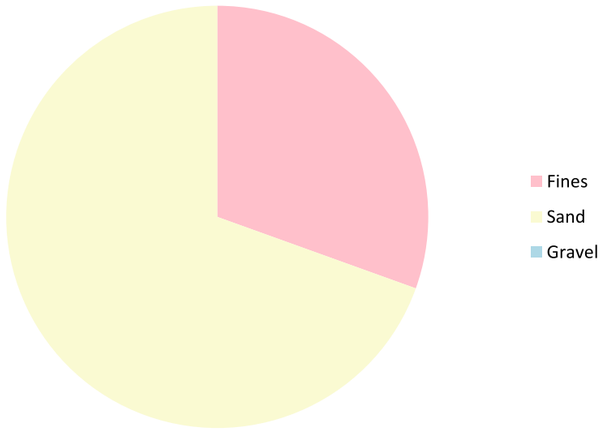
**ENV09**

| Aperature (µm) | Aperature (Phi) | Percentage Fraction | Cumulative Percentage | Sediment Description |
|---|---|---|---|---|
| 5656.85 | -2.50 | 0.00 | 0.00 | Pebble |
| 4000.00 | -2.00 | 0.00 | 0.00 | |
| 2828.43 | -1.50 | 0.00 | 0.00 | Granule |
| 2000.00 | -1.00 | 0.00 | 0.00 | |
| 1414.21 | -0.50 | 0.01 | 0.01 | Very coarse sand |
| 1000.00 | 0.00 | 0.05 | 0.05 | |
| 707.11 | 0.50 | 1.02 | 1.07 | Coarse sand |
| 500.00 | 1.00 | 3.70 | 4.77 | |
| 353.55 | 1.50 | 7.02 | 11.79 | Medium sand |
| 250.00 | 2.00 | 9.23 | 21.02 | |
| 176.78 | 2.50 | 11.13 | 32.15 | Fine sand |
| 125.00 | 3.00 | 13.68 | 45.83 | |
| 88.39 | 3.50 | 13.96 | 59.79 | Very fine sand |
| 62.50 | 4.00 | 9.72 | 69.52 | |
| 44.19 | 4.50 | 5.25 | 74.77 | Coarse silt |
| 31.25 | 5.00 | 3.25 | 78.02 | |
| 22.10 | 5.50 | 2.57 | 80.59 | Medium silt |
| 15.63 | 6.00 | 2.74 | 83.33 | |
| 11.05 | 6.50 | 3.25 | 86.58 | Fine silt |
| 7.81 | 7.00 | 3.22 | 89.81 | |
| 5.52 | 7.50 | 2.77 | 92.58 | Very fine silt |
| 3.91 | 8.00 | 2.11 | 94.69 | |
| 2.76 | 8.50 | 1.40 | 96.09 | Clay |
| 1.95 | 9.00 | 0.85 | 96.94 | |
| 1.38 | 9.50 | 0.55 | 97.49 | |
| 0.98 | 10.00 | 0.43 | 97.92 | |
| 0.69 | 10.50 | 0.40 | 98.32 | |
| 0.49 | 11.00 | 0.38 | 98.70 | |
| 0.35 | 11.50 | 0.35 | 99.05 | |
| 0.24 | 12.00 | 0.31 | 99.36 | |
| 0.17 | 12.50 | 0.25 | 99.61 | |
| 0.12 | 13.00 | 0.20 | 99.81 | |
| <0.12 | >13 | 0.19 | 100.00 | |



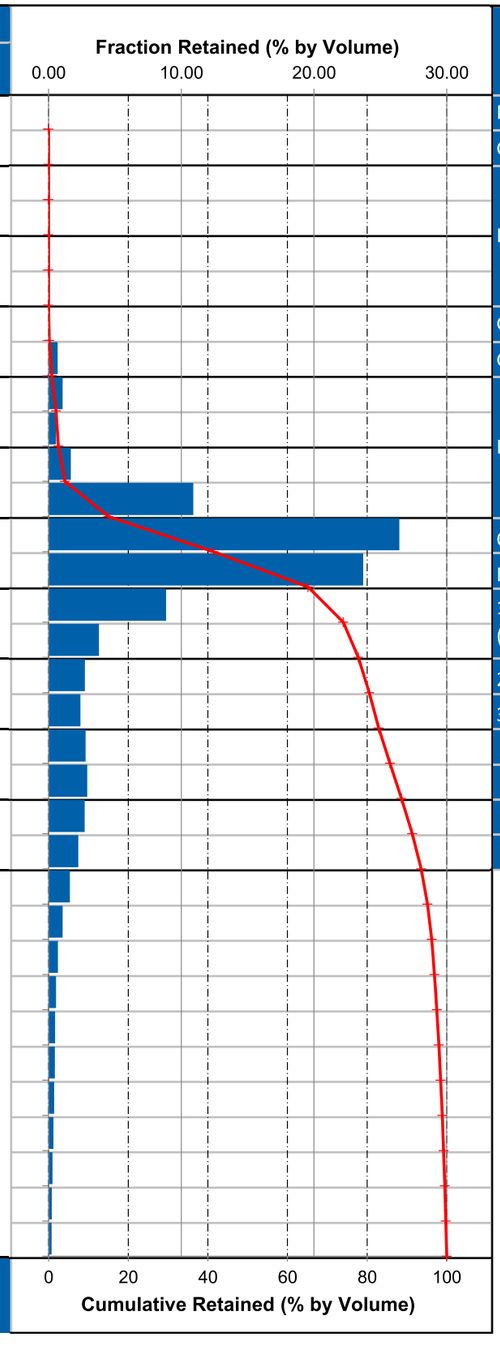

| | | | |
|---|---|---|---|
| Method of Moments | | | |
| Geometric | Mean (µm) | 76.85 | Wentworth: |
| Logarithmic | Mean (Phi) | 3.70 | Very fine sand |
| | Sorting | 2.27 | Very poor |
| | Skewness | 1.32 | Very fine |
| | Kurtosis | 4.88 | Leptokurtic |
| Graphic Folk and Ward | | | |
| Geometric | Mean (µm) | 79.10 | Wentworth: |
| Logarithmic | Mean (Phi) | 3.66 | Very fine sand |
| | Sorting | 2.17 | Very poor |
| | Skewness | 0.37 | Very fine |
| | Kurtosis | 1.23 | Leptokurtic |
| Other Statistics | Phi (ϕ) | µm | Wentworth: |
| Median (D50) | 3.15 | 112.71 | Very fine sand |
| 1st Local Maxima (Mode) | 3.50 | 88.39 | Very fine sand |
| 2nd Local Maxima | 6.50 | 11.05 | Fine silt |
| 3rd Local Maxima | - | - | - |

| Classification | | Composition | |
|---|---|---|---|
| Modified Folk | Muddy sand | Fines | 30.50% |
| EUNIS Folk | Mud and sandy mud | Sand | 69.50% |
| Distribution | Bimodal | Gravel | 0.00% |



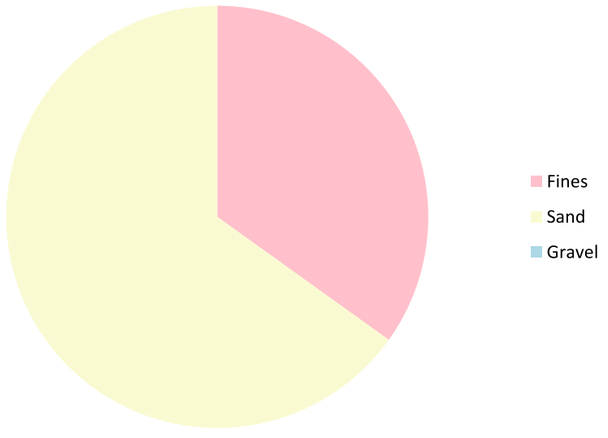
# APPENDIX G PARTICLE SIZE ANALYSIS

| ENV10 | | | | |
|---|---|---|---|---|
| Aperature (µm) | Aperature (Phi) | Percentage Fraction | Cumulative Percentage | Sediment Description |
| 5656.85 | -2.50 | 0.00 | 0.00 | Pebble |
| 4000.00 | -2.00 | 0.00 | 0.00 | |
| 2828.43 | -1.50 | 0.00 | 0.00 | Granule |
| 2000.00 | -1.00 | 0.00 | 0.00 | |
| 1414.21 | -0.50 | 0.00 | 0.00 | Very coarse sand |
| 1000.00 | 0.00 | 0.01 | 0.01 | |
| 707.11 | 0.50 | 0.12 | 0.13 | Coarse sand |
| 500.00 | 1.00 | 0.68 | 0.81 | |
| 353.55 | 1.50 | 1.06 | 1.87 | Medium sand |
| 250.00 | 2.00 | 0.57 | 2.43 | |
| 176.78 | 2.50 | 1.68 | 4.12 | Fine sand |
| 125.00 | 3.00 | 10.90 | 15.02 | |
| 88.39 | 3.50 | 26.42 | 41.44 | Very fine sand |
| 62.50 | 4.00 | 23.71 | 65.15 | |
| 44.19 | 4.50 | 8.84 | 73.99 | Coarse silt |
| 31.25 | 5.00 | 3.80 | 77.80 | |
| 22.10 | 5.50 | 2.73 | 80.53 | Medium silt |
| 15.63 | 6.00 | 2.40 | 82.93 | |
| 11.05 | 6.50 | 2.79 | 85.71 | Fine silt |
| 7.81 | 7.00 | 2.92 | 88.63 | |
| 5.52 | 7.50 | 2.71 | 91.34 | Very fine silt |
| 3.91 | 8.00 | 2.24 | 93.58 | |
| 2.76 | 8.50 | 1.60 | 95.18 | Clay |
| 1.95 | 9.00 | 1.05 | 96.23 | |
| 1.38 | 9.50 | 0.71 | 96.94 | |
| 0.98 | 10.00 | 0.56 | 97.49 | |
| 0.69 | 10.50 | 0.50 | 97.99 | |
| 0.49 | 11.00 | 0.46 | 98.45 | |
| 0.35 | 11.50 | 0.42 | 98.87 | |
| 0.24 | 12.00 | 0.37 | 99.24 | |
| 0.17 | 12.50 | 0.30 | 99.54 | |
| 0.12 | 13.00 | 0.23 | 99.77 | |
| <0.12 | >13 | 0.23 | 100.00 | |



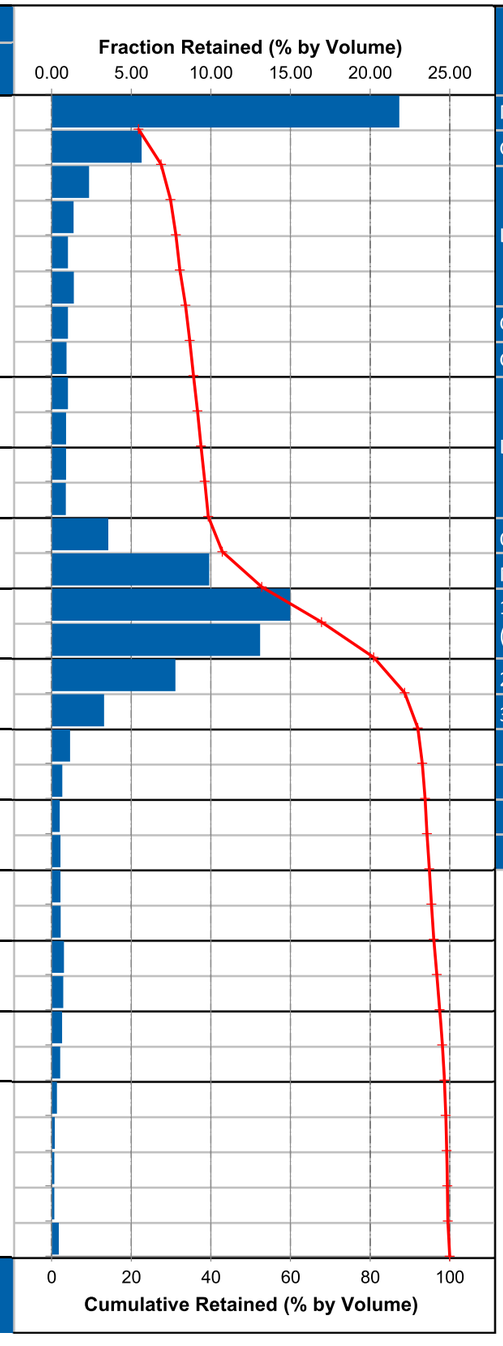

| | | | |
|---|---|---|---|
| Method of Moments | | | |
| Geometric | Mean (µm) | 49.92 | Wentworth: |
| Logarithmic | Mean (Phi) | 4.32 | Coarse silt |
| | Sorting | 1.98 | Poor |
| | Skewness | 1.78 | Very fine |
| | Kurtosis | 6.55 | Leptokurtic |
| Graphic Folk and Ward | | | |
| Geometric | Mean (µm) | 50.86 | Wentworth: |
| Logarithmic | Mean (Phi) | 4.30 | Coarse silt |
| | Sorting | 1.69 | Poor |
| | Skewness | 0.60 | Very fine |
| | Kurtosis | 1.68 | Very leptokurtic |
| Other Statistics | Phi (ϕ) | µm | Wentworth: |
| Median (D50) | 3.68 | 77.99 | Very fine sand |
| 1st Local Maxima (Mode) | 3.50 | 88.39 | Very fine sand |
| 2nd Local Maxima | 7.00 | 7.81 | Fine silt |
| 3rd Local Maxima | 1.50 | 353.55 | Medium sand |

| Classification | | Composition | |
|---|---|---|---|
| Modified Folk | Muddy sand | Fines | 34.90% |
| EUNIS Folk | Mud and sandy mud | Sand | 65.10% |
| Distribution | Multimodal | Gravel | 0.00% |



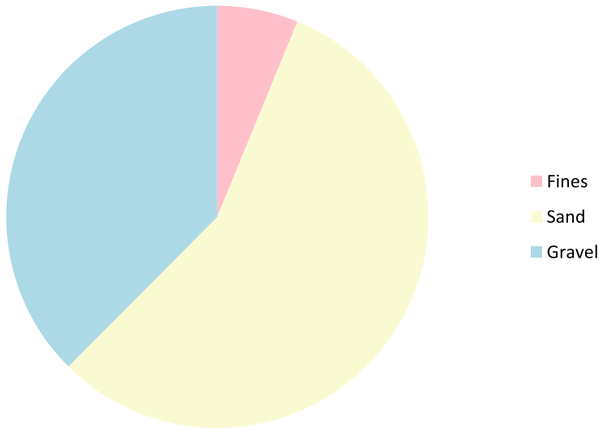
# APPENDIX G PARTICLE SIZE ANALYSIS

| ENV11 | | | | |
|---|---|---|---|---|
| Aperature (µm) | Aperature (Phi) | Percentage Fraction | Cumulative Percentage | Sediment Description |
| 45254.83 | -5.50 | 21.83 | 21.83 | Pebble |
| 32000.00 | -5.00 | 5.65 | 27.48 | |
| 22627.42 | -4.50 | 2.36 | 29.84 | |
| 16000.00 | -4.00 | 1.38 | 31.22 | |
| 11313.71 | -3.50 | 1.02 | 32.24 | |
| 8000.00 | -3.00 | 1.40 | 33.64 | |
| 5656.85 | -2.50 | 1.03 | 34.67 | |
| 4000.00 | -2.00 | 0.94 | 35.61 | |
| 2828.43 | -1.50 | 1.03 | 36.63 | Granule |
| 2000.00 | -1.00 | 0.91 | 37.55 | |
| 1414.21 | -0.50 | 0.91 | 38.45 | Very coarse sand |
| 1000.00 | 0.00 | 0.89 | 39.35 | |
| 707.11 | 0.50 | 3.56 | 42.91 | Coarse sand |
| 500.00 | 1.00 | 9.89 | 52.80 | |
| 353.55 | 1.50 | 14.98 | 67.79 | Medium sand |
| 250.00 | 2.00 | 13.10 | 80.89 | |
| 176.78 | 2.50 | 7.78 | 88.67 | Fine sand |
| 125.00 | 3.00 | 3.29 | 91.96 | |
| 88.39 | 3.50 | 1.15 | 93.12 | Very fine sand |
| 62.50 | 4.00 | 0.67 | 93.79 | |
| 44.19 | 4.50 | 0.51 | 94.30 | Coarse silt |
| 31.25 | 5.00 | 0.55 | 94.85 | |
| 22.10 | 5.50 | 0.56 | 95.41 | Medium silt |
| 15.63 | 6.00 | 0.57 | 95.98 | |
| 11.05 | 6.50 | 0.77 | 96.75 | Fine silt |
| 7.81 | 7.00 | 0.73 | 97.48 | |
| 5.52 | 7.50 | 0.66 | 98.14 | Very fine silt |
| 3.91 | 8.00 | 0.54 | 98.68 | |
| 2.76 | 8.50 | 0.33 | 99.01 | Clay |
| 1.95 | 9.00 | 0.20 | 99.21 | |
| 1.38 | 9.50 | 0.18 | 99.39 | |
| 0.98 | 10.00 | 0.16 | 99.55 | |
| <1.0 | >10 | 0.45 | 100.00 | |



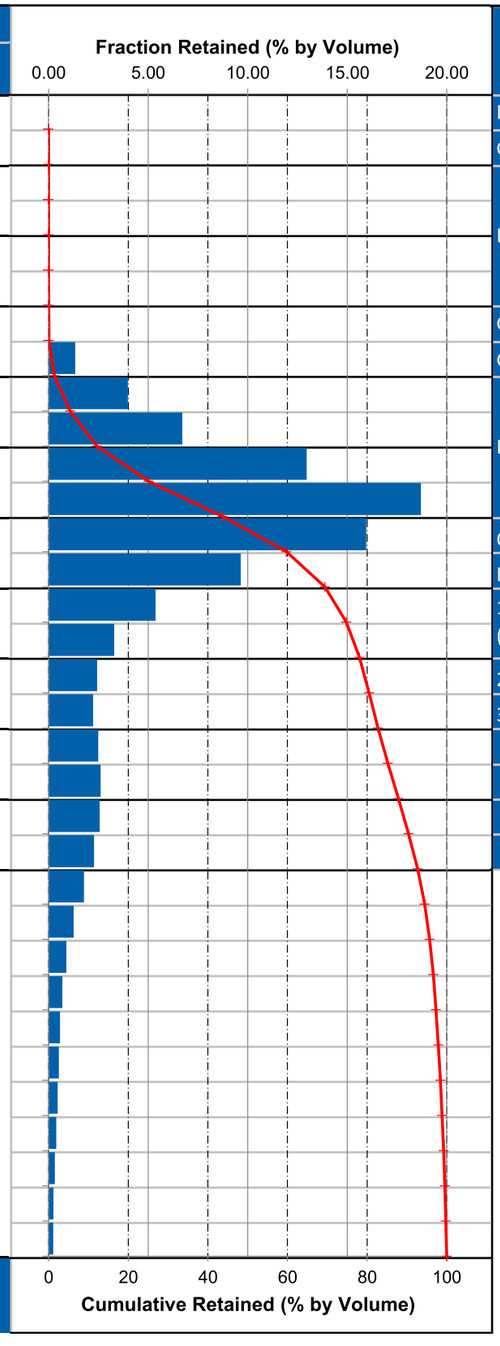

| | | | |
|---|---|---|---|
| Method of Moments | | | |
| Geometric | Mean (µm) | 1559.66 | Wentworth: |
| Logarithmic | Mean (Phi) | -0.64 | Very coarse sand |
| | Sorting | 3.78 | Very poor |
| | Skewness | 0.02 | Symmetrical |
| | Kurtosis | 2.40 | Platykurtic |
| Graphic Folk and Ward | | | |
| Geometric | Mean (µm) | 1813.06 | Wentworth: |
| Logarithmic | Mean (Phi) | -0.86 | Very coarse sand |
| | Sorting | 3.63 | Very poor |
| | Skewness | -0.44 | Very coarse |
| | Kurtosis | 0.65 | Very platykurtic |
| Other Statistics | Phi (ϕ) | µm | Wentworth: |
| Median (D50) | 0.86 | 551.62 | Coarse sand |
| 1st Local Maxima (Mode) | -5.50 | 45254.83 | Pebble |
| 2nd Local Maxima | 1.50 | 353.55 | Medium sand |
| 3rd Local Maxima | -3.00 | 8000.00 | Pebble |

| Classification | | Composition | |
|---|---|---|---|
| Modified Folk | Sandy gravel | Fines | 6.20% |
| EUNIS Folk | Coarse sediments | Sand | 56.20% |
| Distribution | Multimodal | Gravel | 37.50% |



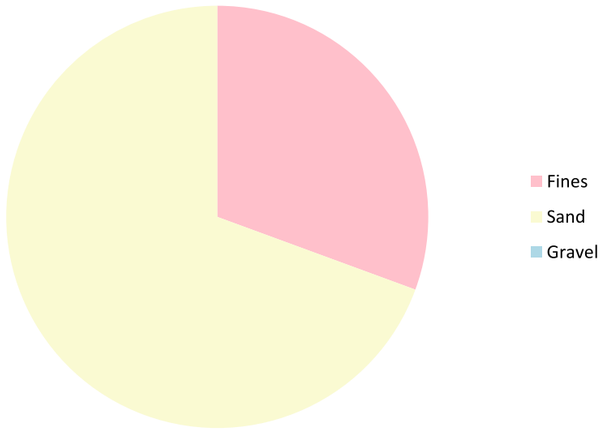
# APPENDIX G PARTICLE SIZE ANALYSIS

| ENV12 | | | | |
|---|---|---|---|---|
| Aperature (µm) | Aperature (Phi) | Percentage Fraction | Cumulative Percentage | Sediment Description |
| 5656.85 | -2.50 | 0.00 | 0.00 | Pebble |
| 4000.00 | -2.00 | 0.00 | 0.00 | |
| 2828.43 | -1.50 | 0.00 | 0.00 | Granule |
| 2000.00 | -1.00 | 0.00 | 0.00 | |
| 1414.21 | -0.50 | 0.01 | 0.01 | Very coarse sand |
| 1000.00 | 0.00 | 0.03 | 0.04 | |
| 707.11 | 0.50 | 0.04 | 0.08 | Coarse sand |
| 500.00 | 1.00 | 1.34 | 1.42 | |
| 353.55 | 1.50 | 3.98 | 5.40 | Medium sand |
| 250.00 | 2.00 | 6.72 | 12.12 | |
| 176.78 | 2.50 | 12.96 | 25.08 | Fine sand |
| 125.00 | 3.00 | 18.70 | 43.78 | |
| 88.39 | 3.50 | 15.96 | 59.74 | Very fine sand |
| 62.50 | 4.00 | 9.65 | 69.39 | |
| 44.19 | 4.50 | 5.38 | 74.77 | Coarse silt |
| 31.25 | 5.00 | 3.29 | 78.06 | |
| 22.10 | 5.50 | 2.43 | 80.49 | Medium silt |
| 15.63 | 6.00 | 2.24 | 82.73 | |
| 11.05 | 6.50 | 2.49 | 85.23 | Fine silt |
| 7.81 | 7.00 | 2.61 | 87.83 | |
| 5.52 | 7.50 | 2.56 | 90.40 | Very fine silt |
| 3.91 | 8.00 | 2.29 | 92.69 | |
| 2.76 | 8.50 | 1.78 | 94.46 | Clay |
| 1.95 | 9.00 | 1.25 | 95.72 | |
| 1.38 | 9.50 | 0.89 | 96.61 | |
| 0.98 | 10.00 | 0.69 | 97.29 | |
| 0.69 | 10.50 | 0.58 | 97.87 | |
| 0.49 | 11.00 | 0.51 | 98.38 | |
| 0.35 | 11.50 | 0.45 | 98.83 | |
| 0.24 | 12.00 | 0.39 | 99.22 | |
| 0.17 | 12.50 | 0.31 | 99.53 | |
| 0.12 | 13.00 | 0.24 | 99.77 | |
| <0.12 | >13 | 0.23 | 100.00 | |



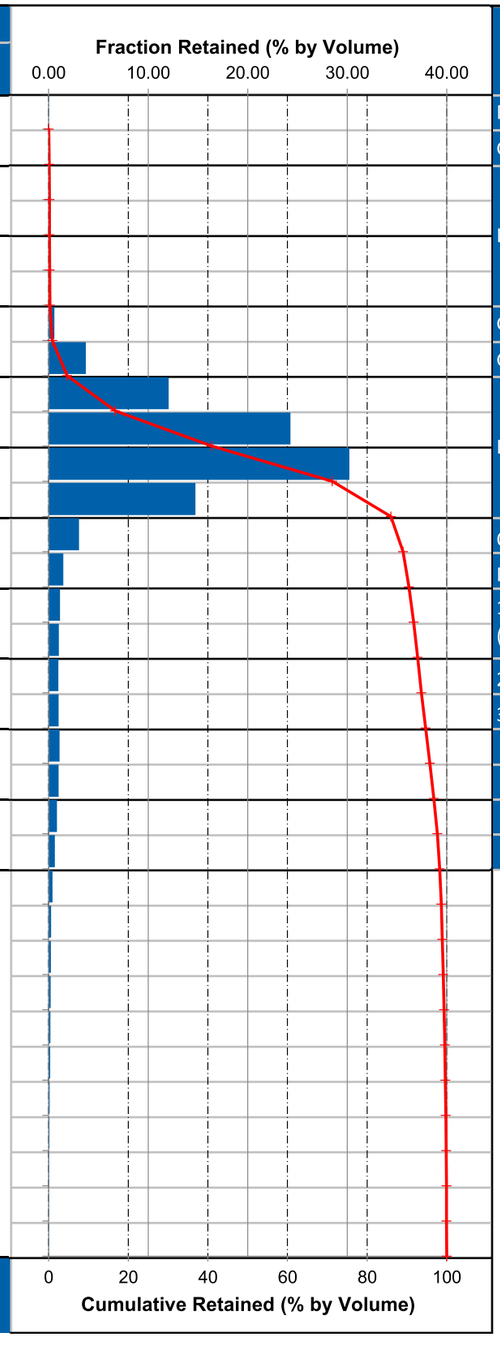

| | | | |
|---|---|---|---|
| Method of Moments | | | |
| Geometric | Mean (µm) | 66.28 | Wentworth: |
| Logarithmic | Mean (Phi) | 3.92 | Very fine sand |
| | Sorting | 2.28 | Very poor |
| | Skewness | 1.53 | Very fine |
| | Kurtosis | 5.18 | Leptokurtic |
| Graphic Folk and Ward | | | |
| Geometric | Mean (µm) | 68.58 | Wentworth: |
| Logarithmic | Mean (Phi) | 3.87 | Very fine sand |
| | Sorting | 2.13 | Very poor |
| | Skewness | 0.51 | Very fine |
| | Kurtosis | 1.46 | Leptokurtic |
| Other Statistics | Phi (ϕ) | µm | Wentworth: |
| Median (D50) | 3.19 | 109.21 | Very fine sand |
| 1st Local Maxima (Mode) | 3.00 | 125.00 | Fine sand |
| 2nd Local Maxima | 7.00 | 7.81 | Fine silt |
| 3rd Local Maxima | - | - | - |

| Classification | | Composition | |
|---|---|---|---|
| Modified Folk | Muddy sand | Fines | 30.60% |
| EUNIS Folk | Mud and sandy mud | Sand | 69.40% |
| Distribution | Bimodal | Gravel | 0.00% |



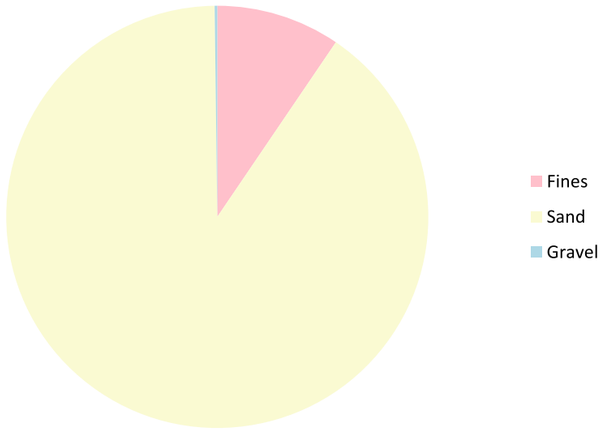
# APPENDIX G PARTICLE SIZE ANALYSIS

| ENV13 | | | | |
|---|---|---|---|---|
| Aperature (µm) | Aperature (Phi) | Percentage Fraction | Cumulative Percentage | Sediment Description |
| 5656.85 | -2.50 | 0.05 | 0.05 | Pebble |
| 4000.00 | -2.00 | 0.08 | 0.13 | |
| 2828.43 | -1.50 | 0.06 | 0.19 | Granule |
| 2000.00 | -1.00 | 0.03 | 0.22 | |
| 1414.21 | -0.50 | 0.05 | 0.27 | Very coarse sand |
| 1000.00 | 0.00 | 0.06 | 0.34 | |
| 707.11 | 0.50 | 0.58 | 0.92 | Coarse sand |
| 500.00 | 1.00 | 3.73 | 4.65 | |
| 353.55 | 1.50 | 12.07 | 16.72 | Medium sand |
| 250.00 | 2.00 | 24.30 | 41.02 | |
| 176.78 | 2.50 | 30.21 | 71.23 | Fine sand |
| 125.00 | 3.00 | 14.75 | 85.98 | |
| 88.39 | 3.50 | 3.05 | 89.03 | Very fine sand |
| 62.50 | 4.00 | 1.48 | 90.52 | |
| 44.19 | 4.50 | 1.14 | 91.66 | Coarse silt |
| 31.25 | 5.00 | 1.02 | 92.68 | |
| 22.10 | 5.50 | 0.97 | 93.66 | Medium silt |
| 15.63 | 6.00 | 1.01 | 94.67 | |
| 11.05 | 6.50 | 1.11 | 95.78 | Fine silt |
| 7.81 | 7.00 | 1.00 | 96.78 | |
| 5.52 | 7.50 | 0.84 | 97.62 | Very fine silt |
| 3.91 | 8.00 | 0.64 | 98.25 | |
| 2.76 | 8.50 | 0.40 | 98.65 | Clay |
| 1.95 | 9.00 | 0.25 | 98.91 | |
| 1.38 | 9.50 | 0.22 | 99.12 | |
| 0.98 | 10.00 | 0.21 | 99.34 | |
| 0.69 | 10.50 | 0.18 | 99.52 | |
| 0.49 | 11.00 | 0.15 | 99.67 | |
| 0.35 | 11.50 | 0.11 | 99.78 | |
| 0.24 | 12.00 | 0.08 | 99.86 | |
| 0.17 | 12.50 | 0.06 | 99.92 | |
| 0.12 | 13.00 | 0.04 | 99.96 | |
| <0.12 | >13 | 0.04 | 100.00 | |



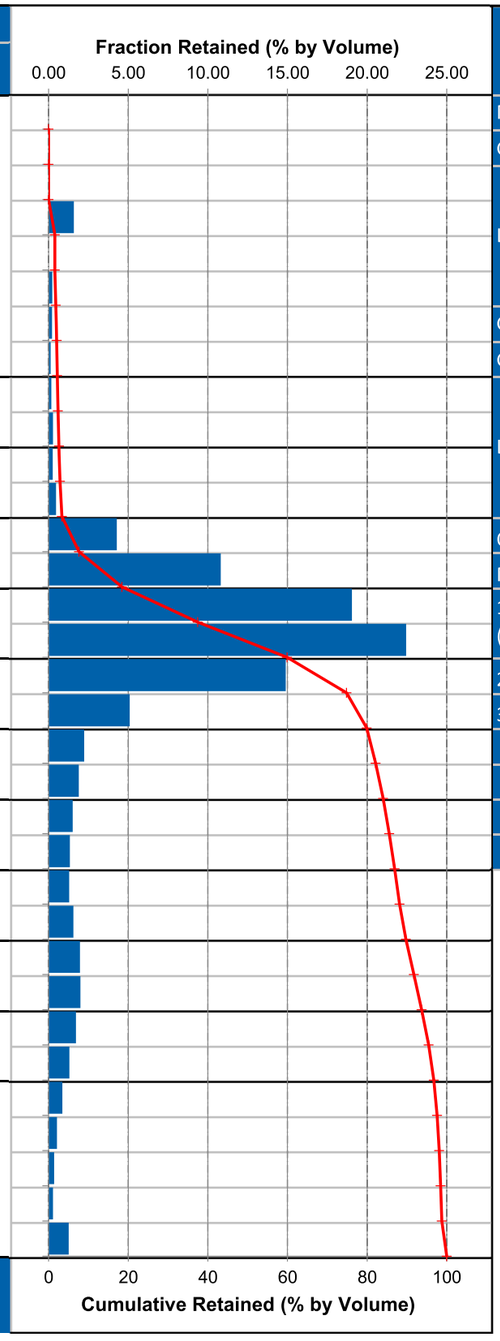

| | | | |
|---|---|---|---|
| Method of Moments | | | |
| Geometric | Mean (µm) | 181.18 | Wentworth: |
| Logarithmic | Mean (Phi) | 2.46 | Fine sand |
| | Sorting | 1.59 | Poor |
| | Skewness | 2.70 | Very fine |
| | Kurtosis | 12.64 | Very leptokurtic |
| Graphic Folk and Ward | | | |
| Geometric | Mean (µm) | 220.09 | Wentworth: |
| Logarithmic | Mean (Phi) | 2.18 | Fine sand |
| | Sorting | 1.14 | Poor |
| | Skewness | 0.32 | Very fine |
| | Kurtosis | 2.20 | Very leptokurtic |
| Other Statistics | Phi (ϕ) | µm | Wentworth: |
| Median (D50) | 2.15 | 225.53 | Fine sand |
| 1st Local Maxima (Mode) | 2.50 | 176.78 | Fine sand |
| 2nd Local Maxima | 6.50 | 11.05 | Fine silt |
| 3rd Local Maxima | - | - | - |

| Classification | | Composition | |
|---|---|---|---|
| Modified Folk | Sand | Fines | 9.50% |
| EUNIS Folk | Sand and muddy sand | Sand | 90.30% |
| Distribution | Bimodal | Gravel | 0.20% |



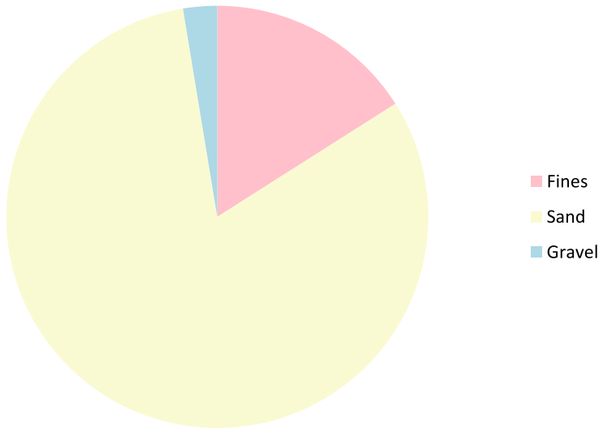
# APPENDIX G PARTICLE SIZE ANALYSIS

| ENV14 | | | | |
|---|---|---|---|---|
| Aperature (µm) | Aperature (Phi) | Percentage Fraction | Cumulative Percentage | Sediment Description |
| 45254.83 | -5.50 | 0.00 | 0.00 | |
| 32000.00 | -5.00 | 0.00 | 0.00 | |
| 22627.42 | -4.50 | 0.00 | 0.00 | |
| 16000.00 | -4.00 | 1.59 | 1.59 | Pebble |
| 11313.71 | -3.50 | 0.00 | 1.59 | |
| 8000.00 | -3.00 | 0.23 | 1.82 | |
| 5656.85 | -2.50 | 0.22 | 2.03 | |
| 4000.00 | -2.00 | 0.12 | 2.16 | |
| 2828.43 | -1.50 | 0.18 | 2.34 | Granule |
| 2000.00 | -1.00 | 0.27 | 2.61 | |
| 1414.21 | -0.50 | 0.26 | 2.86 | Very coarse sand |
| 1000.00 | 0.00 | 0.47 | 3.34 | |
| 707.11 | 0.50 | 4.28 | 7.62 | Coarse sand |
| 500.00 | 1.00 | 10.81 | 18.43 | |
| 353.55 | 1.50 | 19.05 | 37.48 | Medium sand |
| 250.00 | 2.00 | 22.46 | 59.94 | |
| 176.78 | 2.50 | 14.88 | 74.82 | Fine sand |
| 125.00 | 3.00 | 5.09 | 79.91 | |
| 88.39 | 3.50 | 2.24 | 82.15 | Very fine sand |
| 62.50 | 4.00 | 1.90 | 84.05 | |
| 44.19 | 4.50 | 1.51 | 85.55 | Coarse silt |
| 31.25 | 5.00 | 1.34 | 86.89 | |
| 22.10 | 5.50 | 1.29 | 88.18 | Medium silt |
| 15.63 | 6.00 | 1.56 | 89.74 | |
| 11.05 | 6.50 | 1.98 | 91.72 | Fine silt |
| 7.81 | 7.00 | 2.00 | 93.71 | |
| 5.52 | 7.50 | 1.72 | 95.43 | Very fine silt |
| 3.91 | 8.00 | 1.30 | 96.73 | |
| 2.76 | 8.50 | 0.86 | 97.59 | Clay |
| 1.95 | 9.00 | 0.53 | 98.12 | |
| 1.38 | 9.50 | 0.35 | 98.47 | |
| 0.98 | 10.00 | 0.27 | 98.74 | |
| <1.0 | >10 | 1.26 | 100.00 | |




| | | | |
|---|---|---|---|
| Method of Moments | | | |
| Geometric | Mean (µm) | 197.86 | Wentworth: |
| Logarithmic | Mean (Phi) | 2.34 | Fine sand |
| | Sorting | 2.37 | Very poor |
| | Skewness | 1.27 | Fine |
| | Kurtosis | 6.51 | Leptokurtic |
| Graphic Folk and Ward | | | |
| Geometric | Mean (µm) | 214.94 | Wentworth: |
| Logarithmic | Mean (Phi) | 2.22 | Fine sand |
| | Sorting | 1.86 | Poor |
| | Skewness | 0.49 | Very fine |
| | Kurtosis | 2.19 | Very leptokurtic |
| Other Statistics | Phi (ϕ) | µm | Wentworth: |
| Median (D50) | 1.78 | 291.44 | Medium sand |
| 1st Local Maxima (Mode) | 2.00 | 250.00 | Medium sand |
| 2nd Local Maxima | 7.00 | 7.81 | Fine silt |
| 3rd Local Maxima | -4.00 | 16000.00 | Pebble |

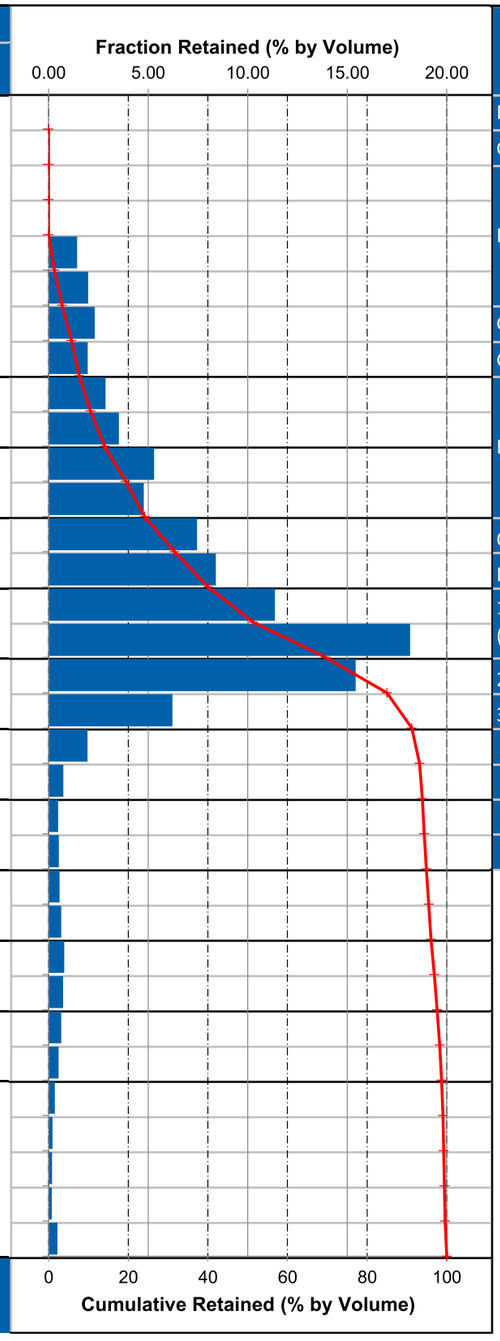
| Classification | | Composition | |
|---|---|---|---|
| Modified Folk | Slightly gravelly muddy sand | Fines | 16.00% |
| EUNIS Folk | Sand and muddy sand | Sand | 81.40% |
| Distribution | Multimodal | Gravel | 2.60% |



# APPENDIX G PARTICLE SIZE ANALYSIS

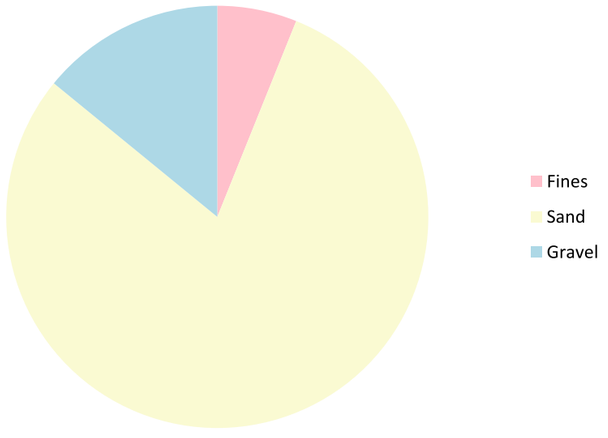
**ENV15**

| Aperature (µm) | Aperature (Phi) | Percentage Fraction | Cumulative Percentage | Sediment Description |
|---|---|---|---|---|
| 45254.83 | -5.50 | 0.00 | 0.00 | |
| 32000.00 | -5.00 | 0.00 | 0.00 | |
| 22627.42 | -4.50 | 0.00 | 0.00 | |
| 16000.00 | -4.00 | 0.00 | 0.00 | Pebble |
| 11313.71 | -3.50 | 1.43 | 1.43 | |
| 8000.00 | -3.00 | 1.99 | 3.42 | |
| 5656.85 | -2.50 | 2.32 | 5.74 | |
| 4000.00 | -2.00 | 1.96 | 7.70 | |
| 2828.43 | -1.50 | 2.86 | 10.56 | Granule |
| 2000.00 | -1.00 | 3.53 | 14.09 | |
| 1414.21 | -0.50 | 5.31 | 19.39 | Very coarse sand |
| 1000.00 | 0.00 | 4.78 | 24.17 | |
| 707.11 | 0.50 | 7.45 | 31.63 | Coarse sand |
| 500.00 | 1.00 | 8.40 | 40.03 | |
| 353.55 | 1.50 | 11.37 | 51.40 | Medium sand |
| 250.00 | 2.00 | 18.16 | 69.56 | |
| 176.78 | 2.50 | 15.43 | 84.99 | Fine sand |
| 125.00 | 3.00 | 6.22 | 91.21 | |
| 88.39 | 3.50 | 1.95 | 93.16 | Very fine sand |
| 62.50 | 4.00 | 0.73 | 93.89 | |
| 44.19 | 4.50 | 0.48 | 94.36 | Coarse silt |
| 31.25 | 5.00 | 0.52 | 94.88 | |
| 22.10 | 5.50 | 0.55 | 95.43 | Medium silt |
| 15.63 | 6.00 | 0.64 | 96.07 | |
| 11.05 | 6.50 | 0.78 | 96.85 | Fine silt |
| 7.81 | 7.00 | 0.73 | 97.58 | |
| 5.52 | 7.50 | 0.63 | 98.22 | Very fine silt |
| 3.91 | 8.00 | 0.50 | 98.71 | |
| 2.76 | 8.50 | 0.31 | 99.02 | Clay |
| 1.95 | 9.00 | 0.19 | 99.22 | |
| 1.38 | 9.50 | 0.17 | 99.39 | |
| 0.98 | 10.00 | 0.17 | 99.56 | |
| <1.0 | >10 | 0.44 | 100.00 | |




| | | | |
|---|---|---|---|
| Method of Moments | | | |
| Geometric | Mean (µm) | 436.64 | Wentworth: |
| Logarithmic | Mean (Phi) | 1.20 | Medium sand |
| | Sorting | 2.20 | Very poor |
| | Skewness | 0.74 | Fine |
| | Kurtosis | 6.02 | Leptokurtic |
| Graphic Folk and Ward | | | |
| Geometric | Mean (µm) | 490.07 | Wentworth: |
| Logarithmic | Mean (Phi) | 1.03 | Medium sand |
| | Sorting | 2.00 | Poor |
| | Skewness | -0.21 | Coarse |
| | Kurtosis | 1.50 | Very leptokurtic |
| Other Statistics | Phi (ϕ) | µm | Wentworth: |
| Median (D50) | 1.44 | 368.94 | Medium sand |
| 1st Local Maxima (Mode) | 2.00 | 250.00 | Medium sand |
| 2nd Local Maxima | -0.50 | 1414.21 | Very coarse sand |
| 3rd Local Maxima | -2.50 | 5656.85 | Pebble |

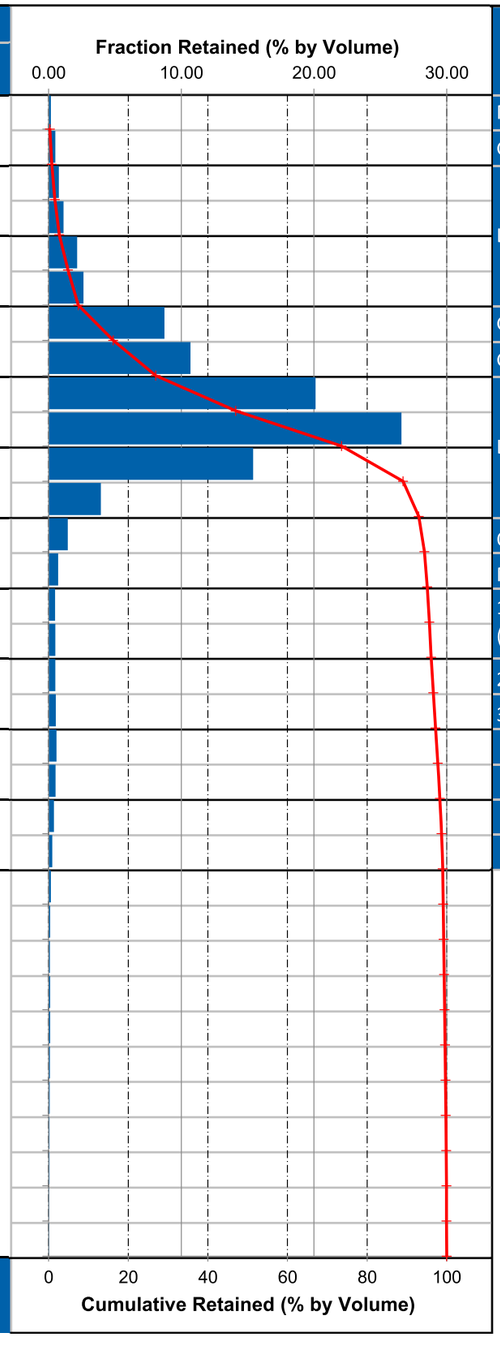
| Classification | | Composition | |
|---|---|---|---|
| Modified Folk | Gravelly sand | Fines | 6.10% |
| EUNIS Folk | Coarse sediments | Sand | 79.80% |
| Distribution | Multimodal | Gravel | 14.10% |



# APPENDIX G PARTICLE SIZE ANALYSIS

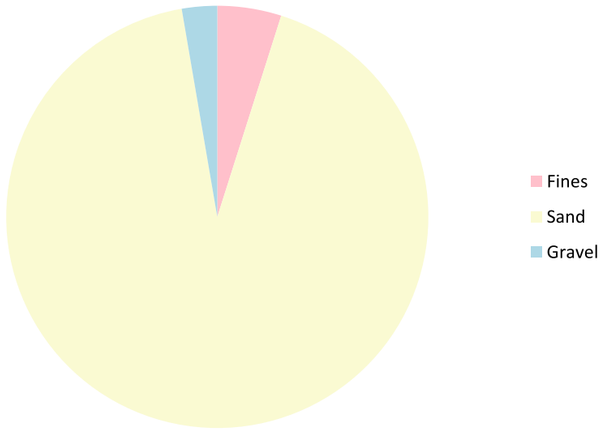
**ENV16**

| Aperature (µm) | Aperature (Phi) | Percentage Fraction | Cumulative Percentage | Sediment Description |
|---|---|---|---|---|
| 5656.85 | -2.50 | 0.17 | 0.31 | Pebble |
| 4000.00 | -2.00 | 0.50 | 0.82 | |
| 2828.43 | -1.50 | 0.77 | 1.59 | Granule |
| 2000.00 | -1.00 | 1.13 | 2.72 | |
| 1414.21 | -0.50 | 2.15 | 4.86 | Very coarse sand |
| 1000.00 | 0.00 | 2.62 | 7.48 | |
| 707.11 | 0.50 | 8.74 | 16.22 | Coarse sand |
| 500.00 | 1.00 | 10.69 | 26.91 | |
| 353.55 | 1.50 | 20.12 | 47.02 | Medium sand |
| 250.00 | 2.00 | 26.59 | 73.61 | |
| 176.78 | 2.50 | 15.41 | 89.02 | Fine sand |
| 125.00 | 3.00 | 3.94 | 92.96 | |
| 88.39 | 3.50 | 1.44 | 94.40 | Very fine sand |
| 62.50 | 4.00 | 0.71 | 95.12 | |
| 44.19 | 4.50 | 0.49 | 95.61 | Coarse silt |
| 31.25 | 5.00 | 0.50 | 96.11 | |
| 22.10 | 5.50 | 0.50 | 96.61 | Medium silt |
| 15.63 | 6.00 | 0.55 | 97.16 | |
| 11.05 | 6.50 | 0.60 | 97.76 | Fine silt |
| 7.81 | 7.00 | 0.52 | 98.28 | |
| 5.52 | 7.50 | 0.40 | 98.68 | Very fine silt |
| 3.91 | 8.00 | 0.28 | 98.97 | |
| 2.76 | 8.50 | 0.17 | 99.14 | Clay |
| 1.95 | 9.00 | 0.11 | 99.25 | |
| 1.38 | 9.50 | 0.11 | 99.36 | |
| 0.98 | 10.00 | 0.12 | 99.48 | |
| 0.69 | 10.50 | 0.11 | 99.59 | |
| 0.49 | 11.00 | 0.10 | 99.69 | |
| 0.35 | 11.50 | 0.09 | 99.78 | |
| 0.24 | 12.00 | 0.07 | 99.85 | |
| 0.17 | 12.50 | 0.06 | 99.91 | |
| 0.12 | 13.00 | 0.04 | 99.95 | |
| <0.12 | >13 | 0.05 | 100.00 | |



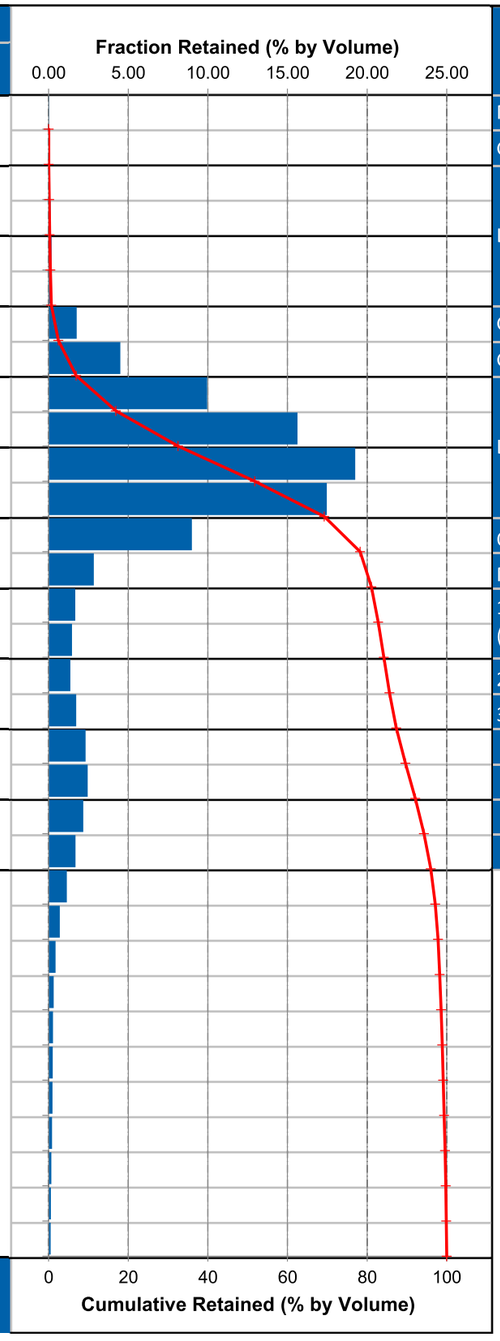

| | | | |
|---|---|---|---|
| Method of Moments | | | |
| Geometric | Mean (µm) | 328.03 | Wentworth: |
| Logarithmic | Mean (Phi) | 1.61 | Medium sand |
| | Sorting | 1.59 | Poor |
| | Skewness | 2.26 | Very fine |
| | Kurtosis | 14.21 | Very leptokurtic |
| Graphic Folk and Ward | | | |
| Geometric | Mean (µm) | 363.45 | Wentworth: |
| Logarithmic | Mean (Phi) | 1.46 | Medium sand |
| | Sorting | 1.13 | Poor |
| | Skewness | -0.04 | Symmetrical |
| | Kurtosis | 1.59 | Very leptokurtic |
| Other Statistics | Phi (ϕ) | µm | Wentworth: |
| Median (D50) | 1.56 | 340.10 | Medium sand |
| 1st Local Maxima (Mode) | 2.00 | 250.00 | Medium sand |
| 2nd Local Maxima | - | - | - |
| 3rd Local Maxima | - | - | - |

| Classification | | Composition | |
|---|---|---|---|
| Modified Folk | Slightly gravelly sand | Fines | 4.90% |
| EUNIS Folk | Sand and muddy sand | Sand | 92.40% |
| Distribution | Unimodal | Gravel | 2.70% |



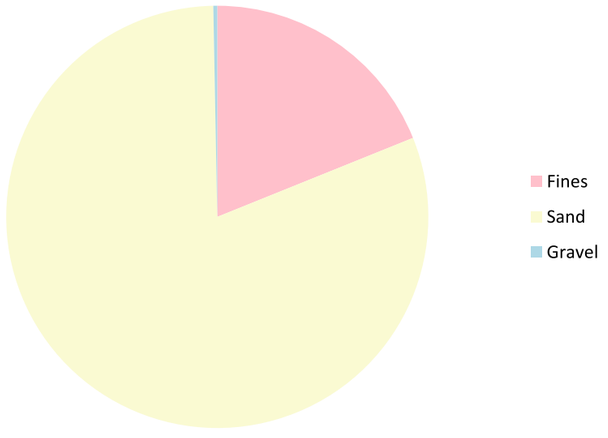
# APPENDIX G PARTICLE SIZE ANALYSIS

| ENV17 | | | | |
|---|---|---|---|---|
| Aperature (µm) | Aperature (Phi) | Percentage Fraction | Cumulative Percentage | Sediment Description |
| 5656.85 | -2.50 | 0.04 | 0.04 | Pebble |
| 4000.00 | -2.00 | 0.02 | 0.07 | |
| 2828.43 | -1.50 | 0.09 | 0.15 | Granule |
| 2000.00 | -1.00 | 0.13 | 0.28 | |
| 1414.21 | -0.50 | 0.19 | 0.47 | Very coarse sand |
| 1000.00 | 0.00 | 0.21 | 0.67 | |
| 707.11 | 0.50 | 1.76 | 2.44 | Coarse sand |
| 500.00 | 1.00 | 4.51 | 6.94 | |
| 353.55 | 1.50 | 9.96 | 16.91 | Medium sand |
| 250.00 | 2.00 | 15.62 | 32.53 | |
| 176.78 | 2.50 | 19.26 | 51.79 | Fine sand |
| 125.00 | 3.00 | 17.47 | 69.26 | |
| 88.39 | 3.50 | 9.00 | 78.26 | Very fine sand |
| 62.50 | 4.00 | 2.83 | 81.10 | |
| 44.19 | 4.50 | 1.67 | 82.76 | Coarse silt |
| 31.25 | 5.00 | 1.46 | 84.23 | |
| 22.10 | 5.50 | 1.36 | 85.59 | Medium silt |
| 15.63 | 6.00 | 1.73 | 87.32 | |
| 11.05 | 6.50 | 2.32 | 89.64 | Fine silt |
| 7.81 | 7.00 | 2.45 | 92.10 | |
| 5.52 | 7.50 | 2.18 | 94.27 | Very fine silt |
| 3.91 | 8.00 | 1.69 | 95.97 | |
| 2.76 | 8.50 | 1.15 | 97.11 | Clay |
| 1.95 | 9.00 | 0.70 | 97.81 | |
| 1.38 | 9.50 | 0.44 | 98.25 | |
| 0.98 | 10.00 | 0.32 | 98.57 | |
| 0.69 | 10.50 | 0.28 | 98.85 | |
| 0.49 | 11.00 | 0.26 | 99.11 | |
| 0.35 | 11.50 | 0.24 | 99.35 | |
| 0.24 | 12.00 | 0.21 | 99.56 | |
| 0.17 | 12.50 | 0.17 | 99.73 | |
| 0.12 | 13.00 | 0.14 | 99.87 | |
| <0.12 | >13 | 0.13 | 100.00 | |



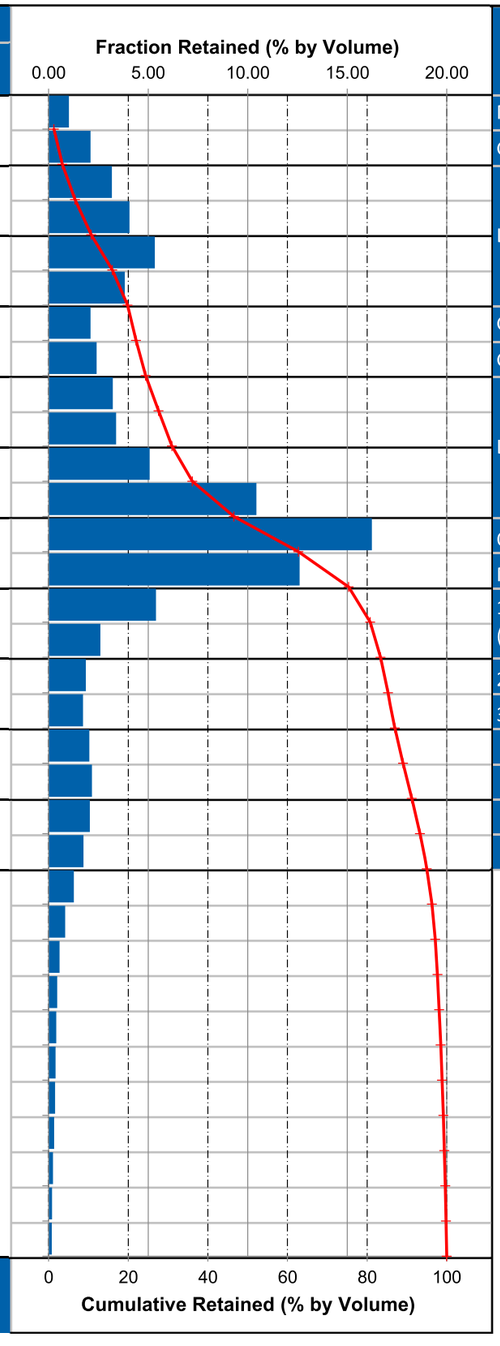

| | | | |
|---|---|---|---|
| Method of Moments | | | |
| Geometric | Mean (µm) | 121.16 | Wentworth: |
| Logarithmic | Mean (Phi) | 3.04 | Very fine sand |
| | Sorting | 2.17 | Very poor |
| | Skewness | 1.71 | Very fine |
| | Kurtosis | 6.18 | Leptokurtic |
| Graphic Folk and Ward | | | |
| Geometric | Mean (µm) | 129.99 | Wentworth: |
| Logarithmic | Mean (Phi) | 2.94 | Fine sand |
| | Sorting | 1.92 | Poor |
| | Skewness | 0.47 | Very fine |
| | Kurtosis | 1.82 | Very leptokurtic |
| Other Statistics | Phi (ϕ) | µm | Wentworth: |
| Median (D50) | 2.45 | 182.56 | Fine sand |
| 1st Local Maxima (Mode) | 2.50 | 176.78 | Fine sand |
| 2nd Local Maxima | 7.00 | 7.81 | Fine silt |
| 3rd Local Maxima | - | - | - |

| Classification | | Composition | |
|---|---|---|---|
| Modified Folk | Muddy sand | Fines | 18.90% |
| EUNIS Folk | Sand and muddy sand | Sand | 80.80% |
| Distribution | Bimodal | Gravel | 0.30% |



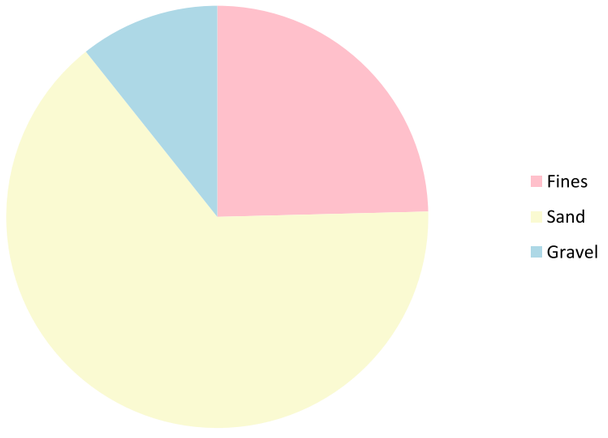
# APPENDIX G PARTICLE SIZE ANALYSIS

| ENV18 | | | | |
|---|---|---|---|---|
| Aperature (µm) | Aperature (Phi) | Percentage Fraction | Cumulative Percentage | Sediment Description |
| 5656.85 | -2.50 | 1.03 | 1.35 | Pebble |
| 4000.00 | -2.00 | 2.11 | 3.46 | |
| 2828.43 | -1.50 | 3.18 | 6.63 | Granule |
| 2000.00 | -1.00 | 4.06 | 10.70 | |
| 1414.21 | -0.50 | 5.34 | 16.04 | Very coarse sand |
| 1000.00 | 0.00 | 3.82 | 19.86 | |
| 707.11 | 0.50 | 2.11 | 21.97 | Coarse sand |
| 500.00 | 1.00 | 2.41 | 24.38 | |
| 353.55 | 1.50 | 3.23 | 27.61 | Medium sand |
| 250.00 | 2.00 | 3.39 | 31.01 | |
| 176.78 | 2.50 | 5.08 | 36.09 | Fine sand |
| 125.00 | 3.00 | 10.44 | 46.53 | |
| 88.39 | 3.50 | 16.24 | 62.77 | Very fine sand |
| 62.50 | 4.00 | 12.61 | 75.37 | |
| 44.19 | 4.50 | 5.40 | 80.77 | Coarse silt |
| 31.25 | 5.00 | 2.60 | 83.37 | |
| 22.10 | 5.50 | 1.87 | 85.24 | Medium silt |
| 15.63 | 6.00 | 1.73 | 86.97 | |
| 11.05 | 6.50 | 2.04 | 89.01 | Fine silt |
| 7.81 | 7.00 | 2.18 | 91.19 | |
| 5.52 | 7.50 | 2.07 | 93.26 | Very fine silt |
| 3.91 | 8.00 | 1.75 | 95.01 | |
| 2.76 | 8.50 | 1.27 | 96.29 | Clay |
| 1.95 | 9.00 | 0.83 | 97.12 | |
| 1.38 | 9.50 | 0.56 | 97.67 | |
| 0.98 | 10.00 | 0.43 | 98.10 | |
| 0.69 | 10.50 | 0.38 | 98.48 | |
| 0.49 | 11.00 | 0.35 | 98.83 | |
| 0.35 | 11.50 | 0.32 | 99.16 | |
| 0.24 | 12.00 | 0.28 | 99.43 | |
| 0.17 | 12.50 | 0.23 | 99.66 | |
| 0.12 | 13.00 | 0.17 | 99.83 | |
| <0.12 | >13 | 0.17 | 100.00 | |




| | | | |
|---|---|---|---|
| Method of Moments | | | |
| Geometric | Mean (µm) | 135.60 | Wentworth: |
| Logarithmic | Mean (Phi) | 2.88 | Fine sand |
| | Sorting | 2.88 | Very poor |
| | Skewness | 0.41 | Symmetrical |
| | Kurtosis | 3.61 | Mesokurtic |
| Graphic Folk and Ward | | | |
| Geometric | Mean (µm) | 166.01 | Wentworth: |
| Logarithmic | Mean (Phi) | 2.59 | Fine sand |
| | Sorting | 2.90 | Very poor |
| | Skewness | -0.14 | Coarse |
| | Kurtosis | 1.38 | Leptokurtic |
| Other Statistics | Phi (ϕ) | µm | Wentworth: |
| Median (D50) | 3.11 | 116.07 | Very fine sand |
| 1st Local Maxima (Mode) | 3.50 | 88.39 | Very fine sand |
| 2nd Local Maxima | -0.50 | 1414.21 | Very coarse sand |
| 3rd Local Maxima | 7.00 | 7.81 | Fine silt |

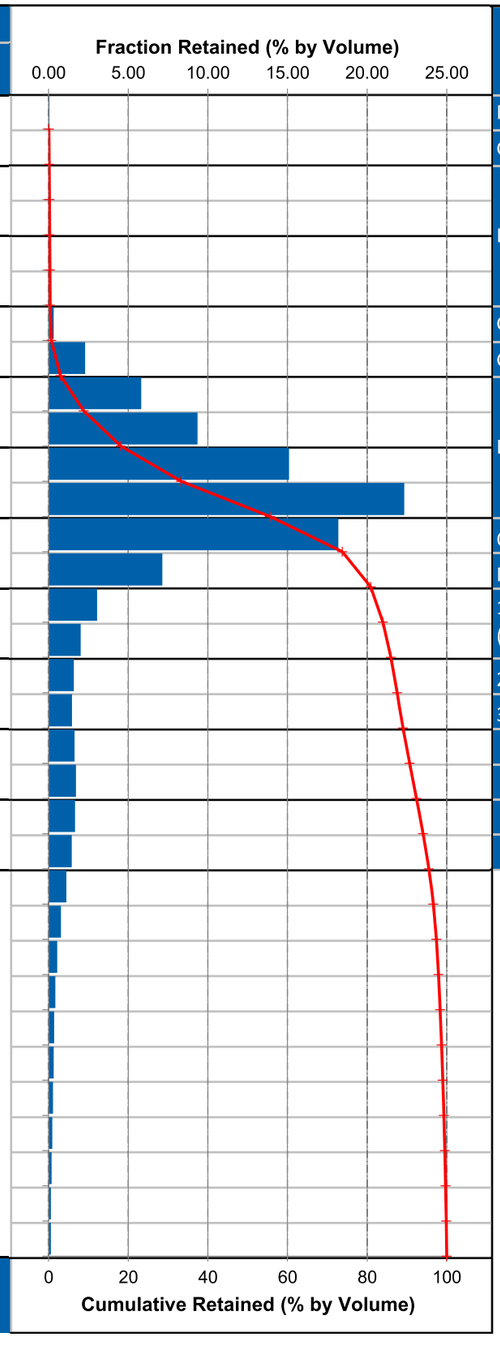
| Classification | | Composition | |
|---|---|---|---|
| Modified Folk | Gravelly muddy sand | Fines | 24.60% |
| EUNIS Folk | Mixed sediments | Sand | 64.70% |
| Distribution | Multimodal | Gravel | 10.70% |



# APPENDIX G PARTICLE SIZE ANALYSIS

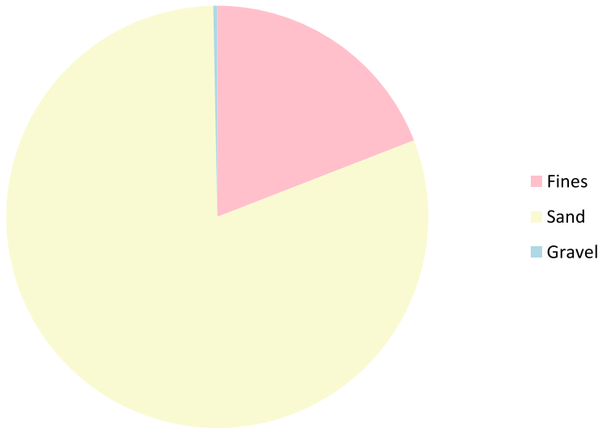
**ENV19**

| Aperature (µm) | Aperature (Phi) | Percentage Fraction | Cumulative Percentage | Sediment Description |
|---|---|---|---|---|
| 5656.85 | -2.50 | 0.05 | 0.08 | Pebble |
| 4000.00 | -2.00 | 0.09 | 0.17 | |
| 2828.43 | -1.50 | 0.06 | 0.23 | Granule |
| 2000.00 | -1.00 | 0.05 | 0.28 | |
| 1414.21 | -0.50 | 0.05 | 0.32 | Very coarse sand |
| 1000.00 | 0.00 | 0.05 | 0.37 | |
| 707.11 | 0.50 | 0.32 | 0.70 | Coarse sand |
| 500.00 | 1.00 | 2.30 | 3.00 | |
| 353.55 | 1.50 | 5.81 | 8.81 | Medium sand |
| 250.00 | 2.00 | 9.35 | 18.16 | |
| 176.78 | 2.50 | 15.09 | 33.25 | Fine sand |
| 125.00 | 3.00 | 22.34 | 55.59 | |
| 88.39 | 3.50 | 18.19 | 73.78 | Very fine sand |
| 62.50 | 4.00 | 7.15 | 80.92 | |
| 44.19 | 4.50 | 3.05 | 83.97 | Coarse silt |
| 31.25 | 5.00 | 2.02 | 85.99 | |
| 22.10 | 5.50 | 1.58 | 87.57 | Medium silt |
| 15.63 | 6.00 | 1.47 | 89.04 | |
| 11.05 | 6.50 | 1.63 | 90.67 | Fine silt |
| 7.81 | 7.00 | 1.72 | 92.39 | |
| 5.52 | 7.50 | 1.66 | 94.06 | Very fine silt |
| 3.91 | 8.00 | 1.45 | 95.50 | |
| 2.76 | 8.50 | 1.11 | 96.61 | Clay |
| 1.95 | 9.00 | 0.78 | 97.39 | |
| 1.38 | 9.50 | 0.55 | 97.93 | |
| 0.98 | 10.00 | 0.42 | 98.35 | |
| 0.69 | 10.50 | 0.35 | 98.70 | |
| 0.49 | 11.00 | 0.31 | 99.02 | |
| 0.35 | 11.50 | 0.27 | 99.29 | |
| 0.24 | 12.00 | 0.23 | 99.52 | |
| 0.17 | 12.50 | 0.19 | 99.71 | |
| 0.12 | 13.00 | 0.15 | 99.86 | |
| <0.12 | >13 | 0.14 | 100.00 | |



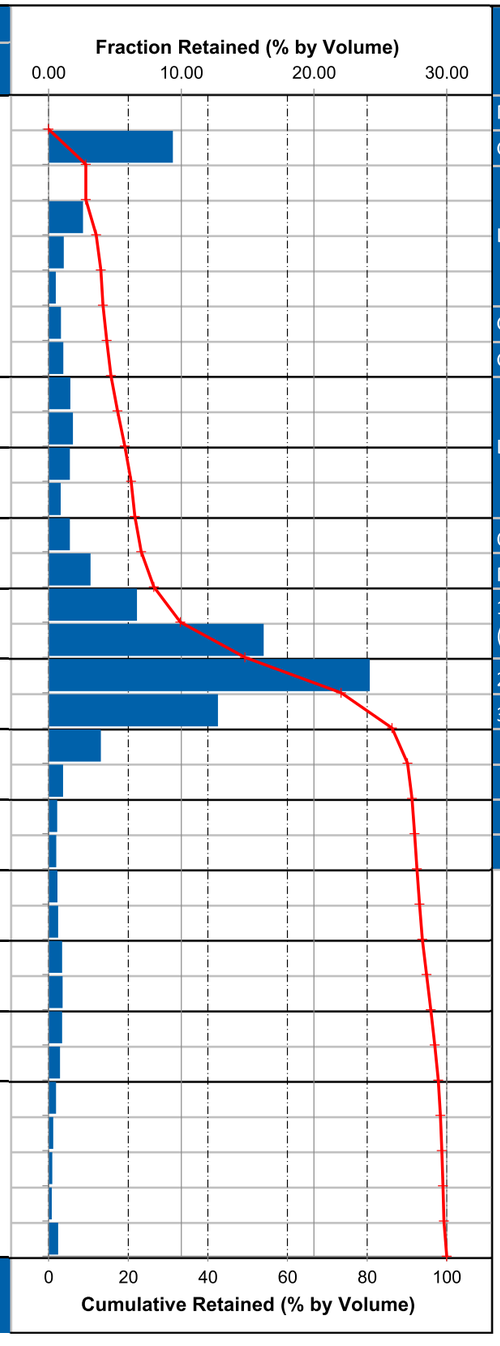

| | | | |
|---|---|---|---|
| Method of Moments | | | |
| Geometric | Mean (µm) | 98.51 | Wentworth: |
| Logarithmic | Mean (Phi) | 3.34 | Very fine sand |
| | Sorting | 2.02 | Very poor |
| | Skewness | 1.87 | Very fine |
| | Kurtosis | 7.41 | Very leptokurtic |
| Graphic Folk and Ward | | | |
| Geometric | Mean (µm) | 117.55 | Wentworth: |
| Logarithmic | Mean (Phi) | 3.09 | Very fine sand |
| | Sorting | 1.66 | Poor |
| | Skewness | 0.37 | Very fine |
| | Kurtosis | 2.01 | Very leptokurtic |
| Other Statistics | Phi (ϕ) | µm | Wentworth: |
| Median (D50) | 2.87 | 136.33 | Fine sand |
| 1st Local Maxima (Mode) | 3.00 | 125.00 | Fine sand |
| 2nd Local Maxima | 7.00 | 7.81 | Fine silt |
| 3rd Local Maxima | - | - | - |

| Classification | | Composition | |
|---|---|---|---|
| Modified Folk | Muddy sand | Fines | 19.10% |
| EUNIS Folk | Sand and muddy sand | Sand | 80.60% |
| Distribution | Bimodal | Gravel | 0.30% |



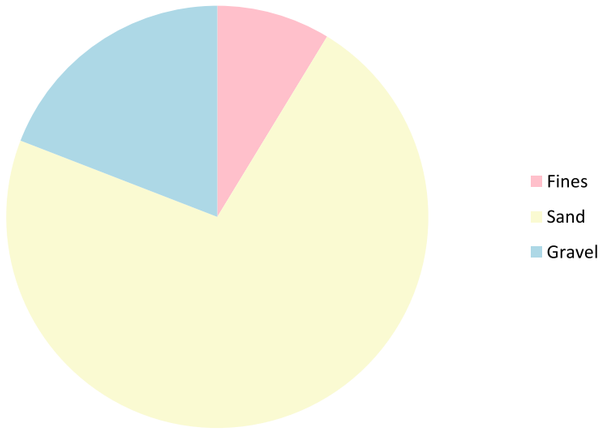
# APPENDIX G PARTICLE SIZE ANALYSIS

| ENV21 | | | | |
|---|---|---|---|---|
| Aperature (µm) | Aperature (Phi) | Percentage Fraction | Cumulative Percentage | Sediment Description |
| 45254.83 | -5.50 | 0.00 | 0.00 | Pebble |
| 32000.00 | -5.00 | 9.37 | 9.37 | |
| 22627.42 | -4.50 | 0.00 | 9.37 | |
| 16000.00 | -4.00 | 2.60 | 11.97 | |
| 11313.71 | -3.50 | 1.14 | 13.11 | |
| 8000.00 | -3.00 | 0.54 | 13.64 | |
| 5656.85 | -2.50 | 0.93 | 14.57 | |
| 4000.00 | -2.00 | 1.10 | 15.67 | |
| 2828.43 | -1.50 | 1.64 | 17.31 | Granule |
| 2000.00 | -1.00 | 1.84 | 19.15 | |
| 1414.21 | -0.50 | 1.60 | 20.74 | Very coarse sand |
| 1000.00 | 0.00 | 0.92 | 21.66 | |
| 707.11 | 0.50 | 1.59 | 23.26 | Coarse sand |
| 500.00 | 1.00 | 3.16 | 26.42 | |
| 353.55 | 1.50 | 6.66 | 33.08 | Medium sand |
| 250.00 | 2.00 | 16.22 | 49.30 | |
| 176.78 | 2.50 | 24.20 | 73.49 | Fine sand |
| 125.00 | 3.00 | 12.76 | 86.25 | |
| 88.39 | 3.50 | 3.93 | 90.18 | Very fine sand |
| 62.50 | 4.00 | 1.10 | 91.28 | |
| 44.19 | 4.50 | 0.66 | 91.93 | Coarse silt |
| 31.25 | 5.00 | 0.58 | 92.52 | |
| 22.10 | 5.50 | 0.67 | 93.18 | Medium silt |
| 15.63 | 6.00 | 0.71 | 93.89 | |
| 11.05 | 6.50 | 1.03 | 94.92 | Fine silt |
| 7.81 | 7.00 | 1.06 | 95.98 | |
| 5.52 | 7.50 | 1.02 | 97.00 | Very fine silt |
| 3.91 | 8.00 | 0.85 | 97.85 | |
| 2.76 | 8.50 | 0.56 | 98.41 | Clay |
| 1.95 | 9.00 | 0.35 | 98.76 | |
| 1.38 | 9.50 | 0.28 | 99.04 | |
| 0.98 | 10.00 | 0.25 | 99.29 | |
| <1.0 | >10 | 0.71 | 100.00 | |



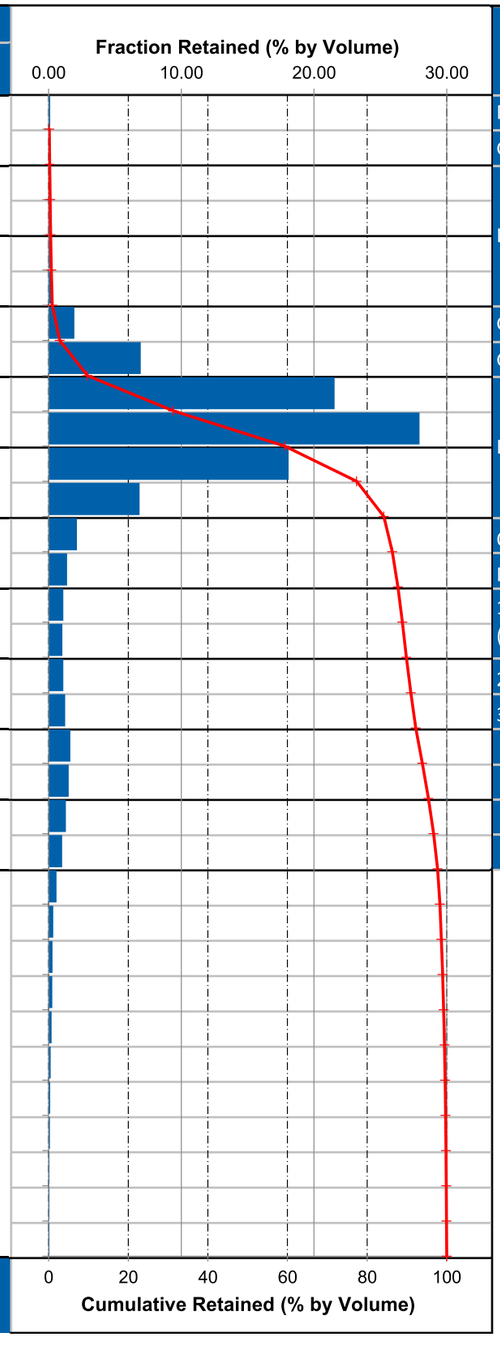

| | | | |
|---|---|---|---|
| Method of Moments | | | |
| Geometric | Mean (µm) | 407.65 | Wentworth: |
| Logarithmic | Mean (Phi) | 1.29 | Medium sand |
| | Sorting | 3.13 | Very poor |
| | Skewness | -0.36 | Symmetrical |
| | Kurtosis | 4.01 | Leptokurtic |
| Graphic Folk and Ward | | | |
| Geometric | Mean (µm) | 496.90 | Wentworth: |
| Logarithmic | Mean (Phi) | 1.01 | Medium sand |
| | Sorting | 2.99 | Very poor |
| | Skewness | -0.43 | Very coarse |
| | Kurtosis | 2.71 | Very leptokurtic |
| Other Statistics | Phi (ϕ) | µm | Wentworth: |
| Median (D50) | 2.01 | 247.49 | Fine sand |
| 1st Local Maxima (Mode) | 2.50 | 176.78 | Fine sand |
| 2nd Local Maxima | -5.00 | 32000.00 | Pebble |
| 3rd Local Maxima | -1.00 | 2000.00 | Granule |

| Classification | | Composition | |
|---|---|---|---|
| Modified Folk | Gravelly muddy sand | Fines | 8.70% |
| EUNIS Folk | Mixed sediments | Sand | 72.10% |
| Distribution | Multimodal | Gravel | 19.10% |



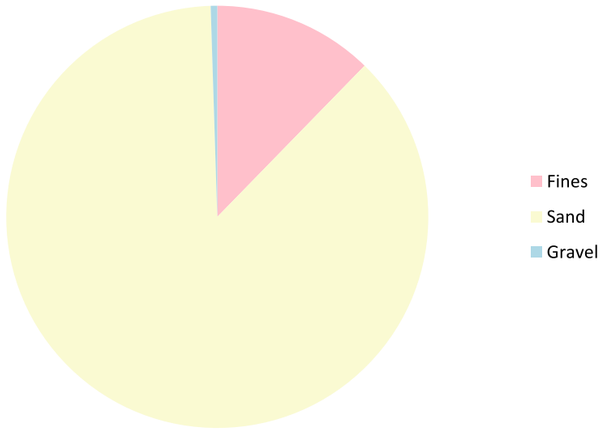
# APPENDIX G PARTICLE SIZE ANALYSIS

| ENV22 | | | | |
|---|---|---|---|---|
| Aperature (µm) | Aperature (Phi) | Percentage Fraction | Cumulative Percentage | Sediment Description |
| 5656.85 | -2.50 | 0.11 | 0.17 | Pebble |
| 4000.00 | -2.00 | 0.13 | 0.30 | |
| 2828.43 | -1.50 | 0.10 | 0.40 | Granule |
| 2000.00 | -1.00 | 0.10 | 0.50 | |
| 1414.21 | -0.50 | 0.17 | 0.67 | Very coarse sand |
| 1000.00 | 0.00 | 0.23 | 0.90 | |
| 707.11 | 0.50 | 1.94 | 2.84 | Coarse sand |
| 500.00 | 1.00 | 6.94 | 9.78 | |
| 353.55 | 1.50 | 21.54 | 31.32 | Medium sand |
| 250.00 | 2.00 | 27.95 | 59.27 | |
| 176.78 | 2.50 | 18.09 | 77.36 | Fine sand |
| 125.00 | 3.00 | 6.85 | 84.21 | |
| 88.39 | 3.50 | 2.13 | 86.34 | Very fine sand |
| 62.50 | 4.00 | 1.39 | 87.73 | |
| 44.19 | 4.50 | 1.11 | 88.83 | Coarse silt |
| 31.25 | 5.00 | 1.04 | 89.87 | |
| 22.10 | 5.50 | 1.11 | 90.98 | Medium silt |
| 15.63 | 6.00 | 1.25 | 92.23 | |
| 11.05 | 6.50 | 1.63 | 93.86 | Fine silt |
| 7.81 | 7.00 | 1.52 | 95.37 | |
| 5.52 | 7.50 | 1.31 | 96.68 | Very fine silt |
| 3.91 | 8.00 | 1.01 | 97.70 | |
| 2.76 | 8.50 | 0.60 | 98.30 | Clay |
| 1.95 | 9.00 | 0.35 | 98.65 | |
| 1.38 | 9.50 | 0.30 | 98.94 | |
| 0.98 | 10.00 | 0.28 | 99.22 | |
| 0.69 | 10.50 | 0.22 | 99.44 | |
| 0.49 | 11.00 | 0.16 | 99.60 | |
| 0.35 | 11.50 | 0.12 | 99.72 | |
| 0.24 | 12.00 | 0.09 | 99.81 | |
| 0.17 | 12.50 | 0.07 | 99.88 | |
| 0.12 | 13.00 | 0.06 | 99.94 | |
| <0.12 | >13 | 0.06 | 100.00 | |



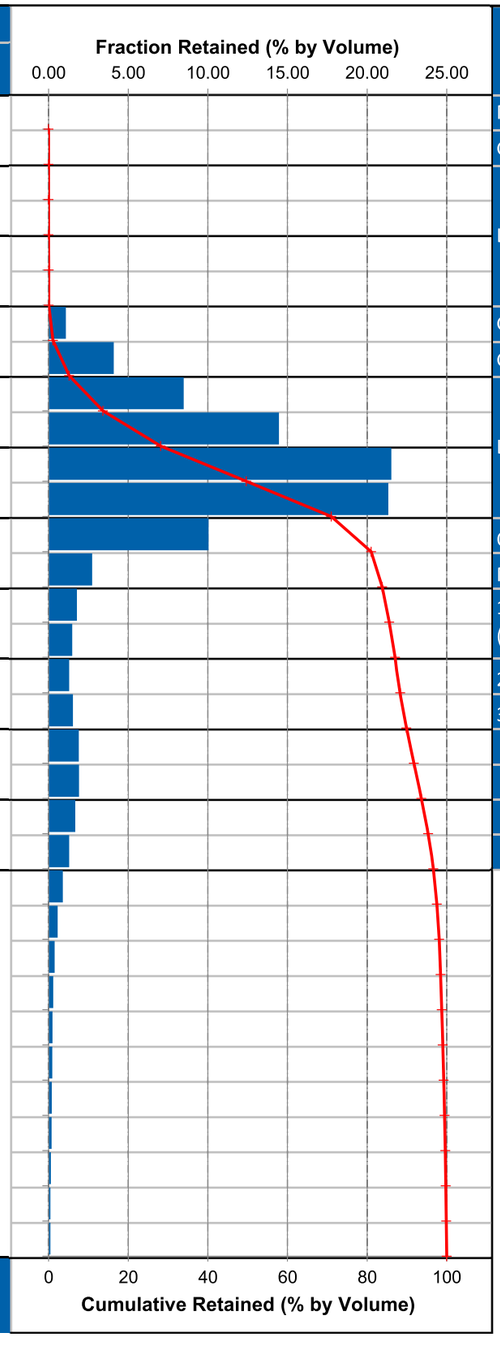

| | | | |
|---|---|---|---|
| Method of Moments | | | |
| Geometric | Mean (µm) | 196.73 | Wentworth: |
| Logarithmic | Mean (Phi) | 2.35 | Fine sand |
| | Sorting | 1.89 | Poor |
| | Skewness | 2.23 | Very fine |
| | Kurtosis | 8.90 | Very leptokurtic |
| Graphic Folk and Ward | | | |
| Geometric | Mean (µm) | 252.13 | Wentworth: |
| Logarithmic | Mean (Phi) | 1.99 | Medium sand |
| | Sorting | 1.40 | Poor |
| | Skewness | 0.44 | Very fine |
| | Kurtosis | 2.36 | Very leptokurtic |
| Other Statistics | Phi (ϕ) | µm | Wentworth: |
| Median (D50) | 1.83 | 280.45 | Medium sand |
| 1st Local Maxima (Mode) | 2.00 | 250.00 | Medium sand |
| 2nd Local Maxima | 6.50 | 11.05 | Fine silt |
| 3rd Local Maxima | - | - | - |

| Classification | | Composition | |
|---|---|---|---|
| Modified Folk | Muddy sand | Fines | 12.30% |
| EUNIS Folk | Sand and muddy sand | Sand | 87.20% |
| Distribution | Bimodal | Gravel | 0.50% |



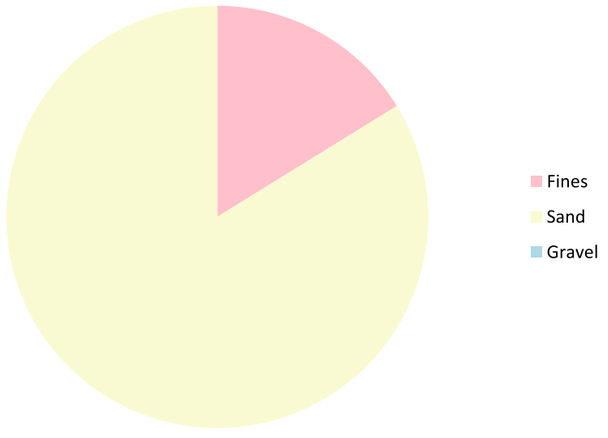
# APPENDIX G PARTICLE SIZE ANALYSIS

| ENV23 | | | | |
|---|---|---|---|---|
| Aperature (µm) | Aperature (Phi) | Percentage Fraction | Cumulative Percentage | Sediment Description |
| 5656.85 | -2.50 | 0.00 | 0.00 | Pebble |
| 4000.00 | -2.00 | 0.00 | 0.00 | |
| 2828.43 | -1.50 | 0.00 | 0.00 | Granule |
| 2000.00 | -1.00 | 0.00 | 0.00 | |
| 1414.21 | -0.50 | 0.01 | 0.01 | Very coarse sand |
| 1000.00 | 0.00 | 0.02 | 0.03 | |
| 707.11 | 0.50 | 1.08 | 1.11 | Coarse sand |
| 500.00 | 1.00 | 4.09 | 5.20 | |
| 353.55 | 1.50 | 8.48 | 13.67 | Medium sand |
| 250.00 | 2.00 | 14.46 | 28.13 | |
| 176.78 | 2.50 | 21.53 | 49.66 | Fine sand |
| 125.00 | 3.00 | 21.33 | 70.99 | |
| 88.39 | 3.50 | 10.04 | 81.03 | Very fine sand |
| 62.50 | 4.00 | 2.73 | 83.76 | |
| 44.19 | 4.50 | 1.78 | 85.55 | Coarse silt |
| 31.25 | 5.00 | 1.48 | 87.02 | |
| 22.10 | 5.50 | 1.29 | 88.31 | Medium silt |
| 15.63 | 6.00 | 1.53 | 89.84 | |
| 11.05 | 6.50 | 1.89 | 91.74 | Fine silt |
| 7.81 | 7.00 | 1.91 | 93.65 | |
| 5.52 | 7.50 | 1.67 | 95.32 | Very fine silt |
| 3.91 | 8.00 | 1.30 | 96.62 | |
| 2.76 | 8.50 | 0.90 | 97.51 | Clay |
| 1.95 | 9.00 | 0.58 | 98.09 | |
| 1.38 | 9.50 | 0.38 | 98.47 | |
| 0.98 | 10.00 | 0.29 | 98.76 | |
| 0.69 | 10.50 | 0.25 | 99.01 | |
| 0.49 | 11.00 | 0.23 | 99.24 | |
| 0.35 | 11.50 | 0.21 | 99.45 | |
| 0.24 | 12.00 | 0.18 | 99.63 | |
| 0.17 | 12.50 | 0.15 | 99.78 | |
| 0.12 | 13.00 | 0.11 | 99.89 | |
| <0.12 | >13 | 0.11 | 100.00 | |



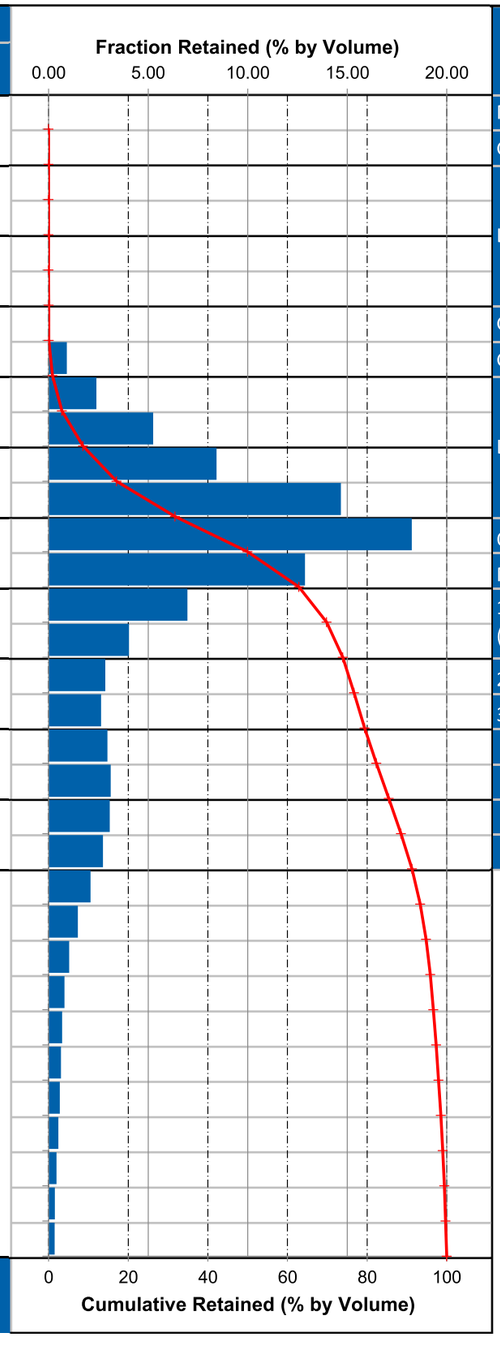

| | | | |
|---|---|---|---|
| Method of Moments | | | |
| Geometric | Mean (µm) | 125.64 | Wentworth: |
| Logarithmic | Mean (Phi) | 2.99 | Fine sand |
| | Sorting | 1.97 | Poor |
| | Skewness | 2.04 | Very fine |
| | Kurtosis | 7.77 | Very leptokurtic |
| Graphic Folk and Ward | | | |
| Geometric | Mean (µm) | 151.96 | Wentworth: |
| Logarithmic | Mean (Phi) | 2.72 | Fine sand |
| | Sorting | 1.60 | Poor |
| | Skewness | 0.39 | Very fine |
| | Kurtosis | 2.01 | Very leptokurtic |
| Other Statistics | Phi (ϕ) | µm | Wentworth: |
| Median (D50) | 2.51 | 175.81 | Fine sand |
| 1st Local Maxima (Mode) | 2.50 | 176.78 | Fine sand |
| 2nd Local Maxima | 7.00 | 7.81 | Fine silt |
| 3rd Local Maxima | - | - | - |

| Classification | | Composition | |
|---|---|---|---|
| Modified Folk | Muddy sand | Fines | 16.20% |
| EUNIS Folk | Sand and muddy sand | Sand | 83.80% |
| Distribution | Bimodal | Gravel | 0.00% |



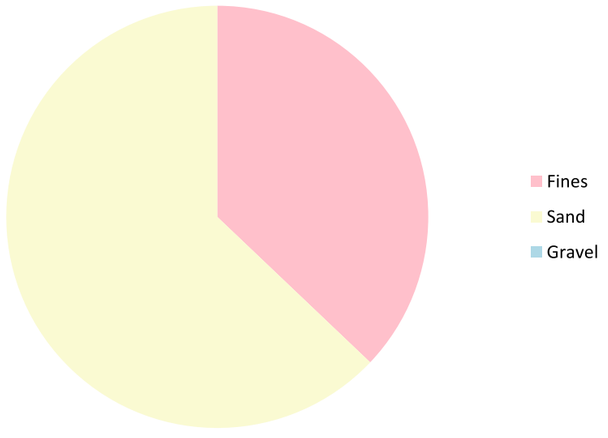
# APPENDIX G PARTICLE SIZE ANALYSIS

| ENV24 | | | | |
|---|---|---|---|---|
| Aperature (µm) | Aperature (Phi) | Percentage Fraction | Cumulative Percentage | Sediment Description |
| 5656.85 | -2.50 | 0.00 | 0.00 | Pebble |
| 4000.00 | -2.00 | 0.00 | 0.00 | |
| 2828.43 | -1.50 | 0.00 | 0.00 | Granule |
| 2000.00 | -1.00 | 0.00 | 0.00 | |
| 1414.21 | -0.50 | 0.00 | 0.00 | Very coarse sand |
| 1000.00 | 0.00 | 0.02 | 0.02 | |
| 707.11 | 0.50 | 0.02 | 0.05 | Coarse sand |
| 500.00 | 1.00 | 0.91 | 0.96 | |
| 353.55 | 1.50 | 2.40 | 3.37 | Medium sand |
| 250.00 | 2.00 | 5.25 | 8.62 | |
| 176.78 | 2.50 | 8.44 | 17.06 | Fine sand |
| 125.00 | 3.00 | 14.68 | 31.74 | |
| 88.39 | 3.50 | 18.24 | 49.98 | Very fine sand |
| 62.50 | 4.00 | 12.89 | 62.86 | |
| 44.19 | 4.50 | 6.98 | 69.84 | Coarse silt |
| 31.25 | 5.00 | 4.04 | 73.88 | |
| 22.10 | 5.50 | 2.85 | 76.73 | Medium silt |
| 15.63 | 6.00 | 2.63 | 79.36 | |
| 11.05 | 6.50 | 2.96 | 82.32 | Fine silt |
| 7.81 | 7.00 | 3.12 | 85.44 | |
| 5.52 | 7.50 | 3.07 | 88.52 | Very fine silt |
| 3.91 | 8.00 | 2.73 | 91.25 | |
| 2.76 | 8.50 | 2.10 | 93.36 | Clay |
| 1.95 | 9.00 | 1.47 | 94.82 | |
| 1.38 | 9.50 | 1.03 | 95.85 | |
| 0.98 | 10.00 | 0.80 | 96.65 | |
| 0.69 | 10.50 | 0.68 | 97.33 | |
| 0.49 | 11.00 | 0.62 | 97.95 | |
| 0.35 | 11.50 | 0.56 | 98.51 | |
| 0.24 | 12.00 | 0.49 | 98.99 | |
| 0.17 | 12.50 | 0.40 | 99.39 | |
| 0.12 | 13.00 | 0.31 | 99.70 | |
| <0.12 | >13 | 0.30 | 100.00 | |



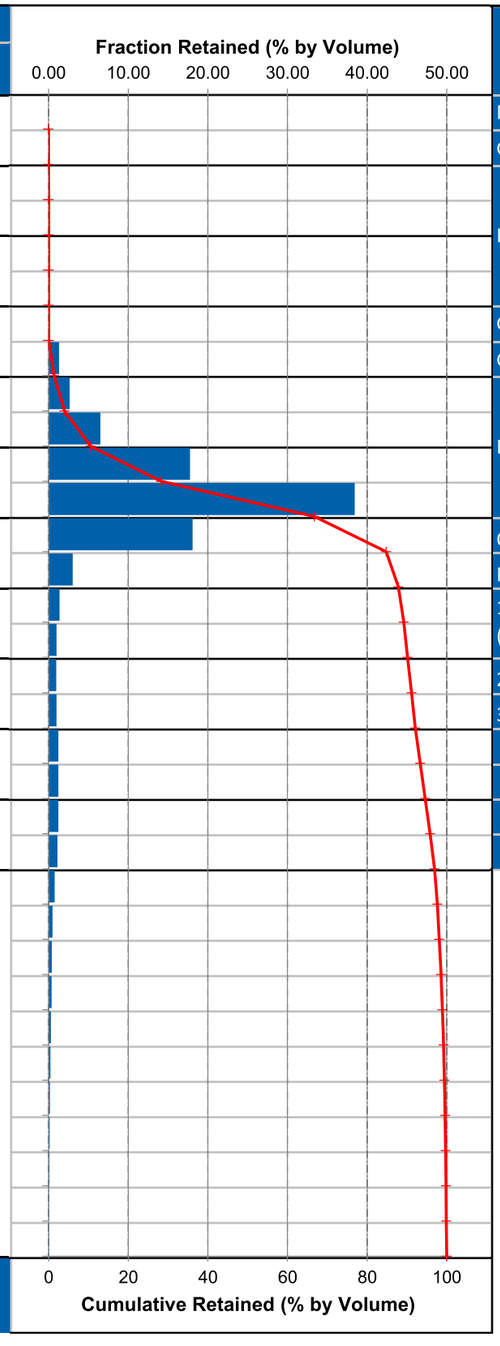

| | | | |
|---|---|---|---|
| Method of Moments | | | |
| Geometric | Mean (µm) | 51.58 | Wentworth: |
| Logarithmic | Mean (Phi) | 4.28 | Coarse silt |
| | Sorting | 2.34 | Very poor |
| | Skewness | 1.38 | Very fine |
| | Kurtosis | 4.67 | Leptokurtic |
| Graphic Folk and Ward | | | |
| Geometric | Mean (µm) | 53.08 | Wentworth: |
| Logarithmic | Mean (Phi) | 4.24 | Coarse silt |
| | Sorting | 2.21 | Very poor |
| | Skewness | 0.51 | Very fine |
| | Kurtosis | 1.26 | Leptokurtic |
| Other Statistics | Phi (ϕ) | µm | Wentworth: |
| Median (D50) | 3.50 | 88.33 | Very fine sand |
| 1st Local Maxima (Mode) | 3.50 | 88.39 | Very fine sand |
| 2nd Local Maxima | 7.00 | 7.81 | Fine silt |
| 3rd Local Maxima | - | - | - |

| Classification | | Composition | |
|---|---|---|---|
| Modified Folk | Muddy sand | Fines | 37.10% |
| EUNIS Folk | Mud and sandy mud | Sand | 62.90% |
| Distribution | Bimodal | Gravel | 0.00% |



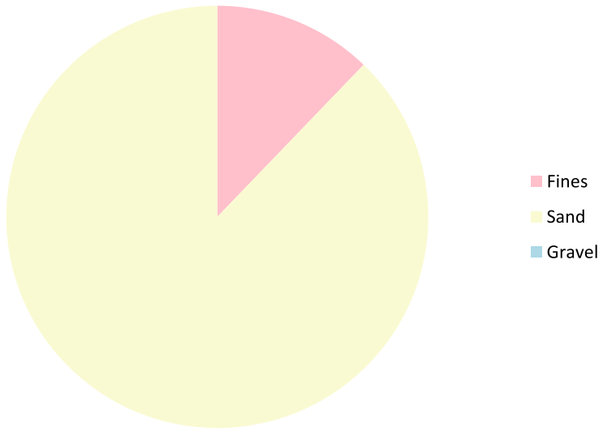
# APPENDIX G PARTICLE SIZE ANALYSIS

| ENV25 | | | | |
|---|---|---|---|---|
| Aperature (µm) | Aperature (Phi) | Percentage Fraction | Cumulative Percentage | Sediment Description |
| 5656.85 | -2.50 | 0.00 | 0.00 | Pebble |
| 4000.00 | -2.00 | 0.01 | 0.01 | |
| 2828.43 | -1.50 | 0.01 | 0.01 | Granule |
| 2000.00 | -1.00 | 0.01 | 0.02 | |
| 1414.21 | -0.50 | 0.01 | 0.03 | Very coarse sand |
| 1000.00 | 0.00 | 0.02 | 0.05 | |
| 707.11 | 0.50 | 0.00 | 0.05 | Coarse sand |
| 500.00 | 1.00 | 1.32 | 1.37 | |
| 353.55 | 1.50 | 2.64 | 4.01 | Medium sand |
| 250.00 | 2.00 | 6.51 | 10.52 | |
| 176.78 | 2.50 | 17.77 | 28.29 | Fine sand |
| 125.00 | 3.00 | 38.44 | 66.73 | |
| 88.39 | 3.50 | 18.09 | 84.82 | Very fine sand |
| 62.50 | 4.00 | 3.01 | 87.83 | |
| 44.19 | 4.50 | 1.37 | 89.20 | Coarse silt |
| 31.25 | 5.00 | 0.98 | 90.18 | |
| 22.10 | 5.50 | 0.95 | 91.14 | Medium silt |
| 15.63 | 6.00 | 0.98 | 92.12 | |
| 11.05 | 6.50 | 1.22 | 93.33 | Fine silt |
| 7.81 | 7.00 | 1.23 | 94.57 | |
| 5.52 | 7.50 | 1.24 | 95.81 | Very fine silt |
| 3.91 | 8.00 | 1.10 | 96.91 | |
| 2.76 | 8.50 | 0.74 | 97.65 | Clay |
| 1.95 | 9.00 | 0.48 | 98.13 | |
| 1.38 | 9.50 | 0.41 | 98.55 | |
| 0.98 | 10.00 | 0.38 | 98.92 | |
| 0.69 | 10.50 | 0.30 | 99.22 | |
| 0.49 | 11.00 | 0.22 | 99.44 | |
| 0.35 | 11.50 | 0.16 | 99.60 | |
| 0.24 | 12.00 | 0.13 | 99.72 | |
| 0.17 | 12.50 | 0.10 | 99.83 | |
| 0.12 | 13.00 | 0.08 | 99.91 | |
| <0.12 | >13 | 0.09 | 100.00 | |



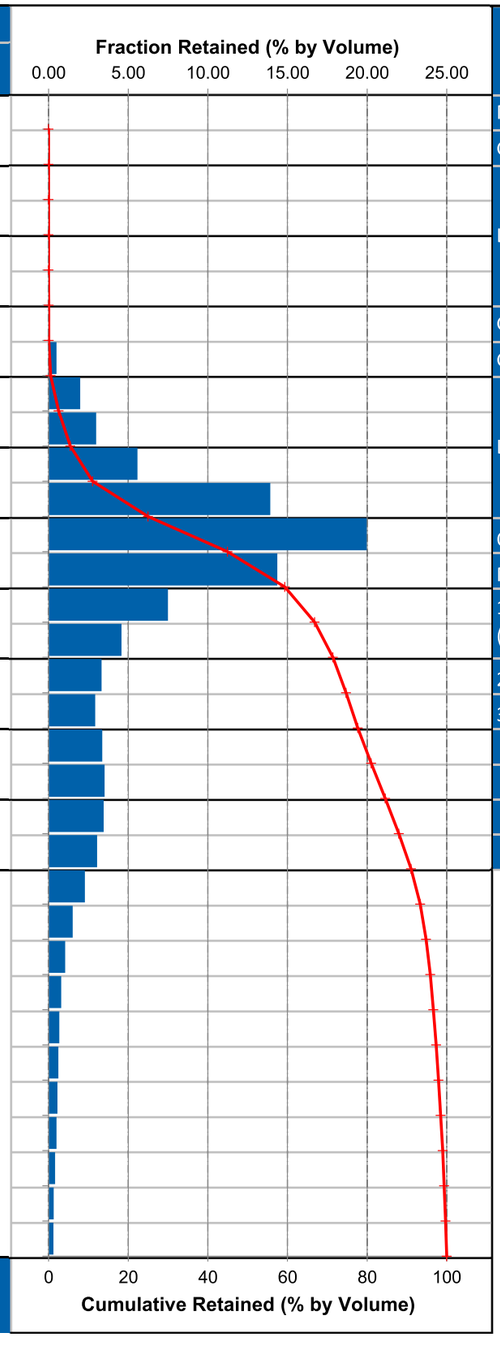

| | | | |
|---|---|---|---|
| Method of Moments | | | |
| Geometric | Mean (µm) | 111.85 | Wentworth: |
| Logarithmic | Mean (Phi) | 3.16 | Very fine sand |
| | Sorting | 1.67 | Poor |
| | Skewness | 2.66 | Very fine |
| | Kurtosis | 11.36 | Very leptokurtic |
| Graphic Folk and Ward | | | |
| Geometric | Mean (µm) | 143.12 | Wentworth: |
| Logarithmic | Mean (Phi) | 2.80 | Fine sand |
| | Sorting | 1.18 | Poor |
| | Skewness | 0.31 | Very fine |
| | Kurtosis | 2.79 | Very leptokurtic |
| Other Statistics | Phi (ϕ) | µm | Wentworth: |
| Median (D50) | 2.78 | 145.35 | Fine sand |
| 1st Local Maxima (Mode) | 3.00 | 125.00 | Fine sand |
| 2nd Local Maxima | 7.50 | 5.52 | Very fine silt |
| 3rd Local Maxima | - | - | - |

| Classification | | Composition | |
|---|---|---|---|
| Modified Folk | Muddy sand | Fines | 12.20% |
| EUNIS Folk | Sand and muddy sand | Sand | 87.80% |
| Distribution | Bimodal | Gravel | 0.00% |



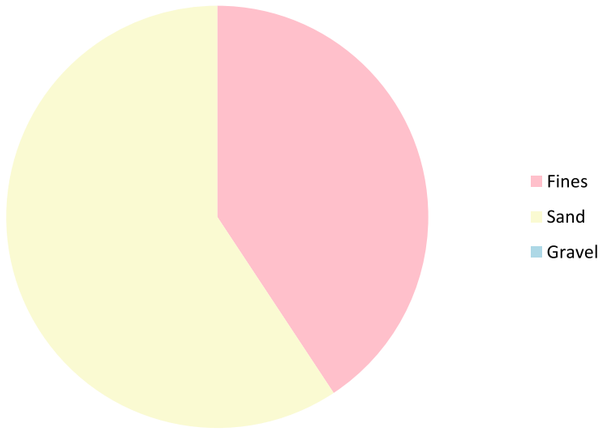
# APPENDIX G PARTICLE SIZE ANALYSIS

| ENV26 | | | | |
|---|---|---|---|---|
| Aperature (µm) | Aperature (Phi) | Percentage Fraction | Cumulative Percentage | Sediment Description |
| 5656.85 | -2.50 | 0.00 | 0.00 | Pebble |
| 4000.00 | -2.00 | 0.00 | 0.00 | |
| 2828.43 | -1.50 | 0.00 | 0.00 | Granule |
| 2000.00 | -1.00 | 0.00 | 0.00 | |
| 1414.21 | -0.50 | 0.00 | 0.00 | Very coarse sand |
| 1000.00 | 0.00 | 0.01 | 0.01 | |
| 707.11 | 0.50 | 0.00 | 0.02 | Coarse sand |
| 500.00 | 1.00 | 0.50 | 0.51 | |
| 353.55 | 1.50 | 1.99 | 2.50 | Medium sand |
| 250.00 | 2.00 | 2.99 | 5.49 | |
| 176.78 | 2.50 | 5.58 | 11.07 | Fine sand |
| 125.00 | 3.00 | 13.92 | 24.99 | |
| 88.39 | 3.50 | 19.97 | 44.96 | Very fine sand |
| 62.50 | 4.00 | 14.37 | 59.33 | |
| 44.19 | 4.50 | 7.49 | 66.81 | Coarse silt |
| 31.25 | 5.00 | 4.58 | 71.39 | |
| 22.10 | 5.50 | 3.33 | 74.72 | Medium silt |
| 15.63 | 6.00 | 2.93 | 77.65 | |
| 11.05 | 6.50 | 3.36 | 81.02 | Fine silt |
| 7.81 | 7.00 | 3.52 | 84.54 | |
| 5.52 | 7.50 | 3.46 | 87.99 | Very fine silt |
| 3.91 | 8.00 | 3.04 | 91.04 | |
| 2.76 | 8.50 | 2.27 | 93.31 | Clay |
| 1.95 | 9.00 | 1.52 | 94.83 | |
| 1.38 | 9.50 | 1.03 | 95.86 | |
| 0.98 | 10.00 | 0.79 | 96.65 | |
| 0.69 | 10.50 | 0.67 | 97.32 | |
| 0.49 | 11.00 | 0.61 | 97.92 | |
| 0.35 | 11.50 | 0.55 | 98.48 | |
| 0.24 | 12.00 | 0.49 | 98.97 | |
| 0.17 | 12.50 | 0.40 | 99.38 | |
| 0.12 | 13.00 | 0.32 | 99.69 | |
| <0.12 | >13 | 0.31 | 100.00 | |




| | | | |
|---|---|---|---|
| Method of Moments | | | |
| Geometric | Mean (µm) | 45.19 | Wentworth: |
| Logarithmic | Mean (Phi) | 4.47 | Coarse silt |
| | Sorting | 2.29 | Very poor |
| | Skewness | 1.34 | Very fine |
| | Kurtosis | 4.59 | Leptokurtic |
| Graphic Folk and Ward | | | |
| Geometric | Mean (µm) | 46.54 | Wentworth: |
| Logarithmic | Mean (Phi) | 4.43 | Coarse silt |
| | Sorting | 2.15 | Very poor |
| | Skewness | 0.52 | Very fine |
| | Kurtosis | 1.15 | Leptokurtic |
| Other Statistics | Phi (ϕ) | µm | Wentworth: |
| Median (D50) | 3.68 | 78.27 | Very fine sand |
| 1st Local Maxima (Mode) | 3.50 | 88.39 | Very fine sand |
| 2nd Local Maxima | 7.00 | 7.81 | Fine silt |
| 3rd Local Maxima | - | - | - |

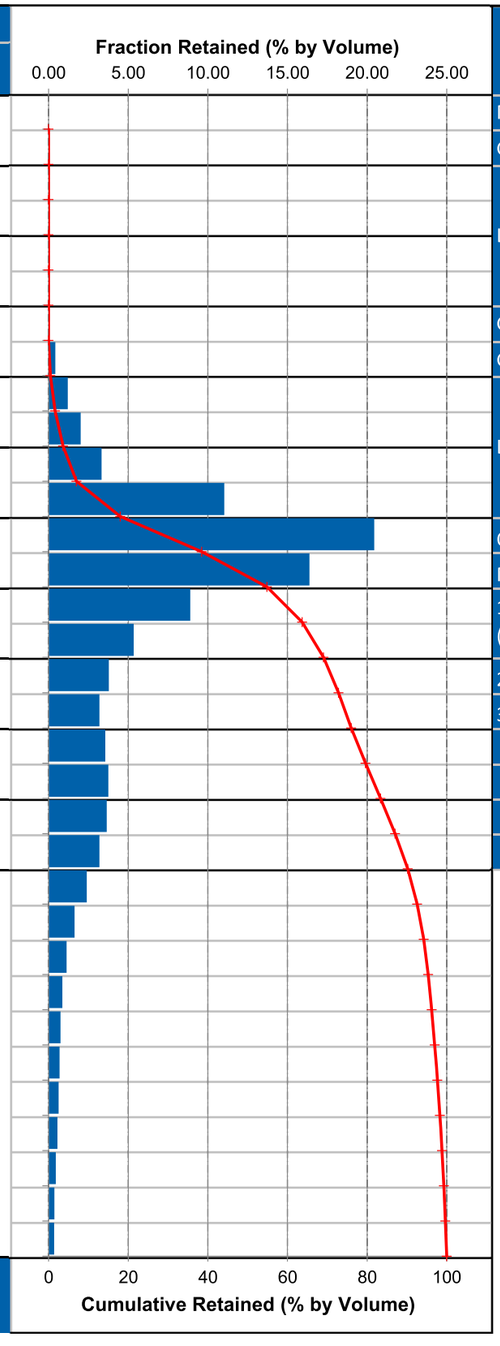
| Classification | | Composition | |
|---|---|---|---|
| Modified Folk | Muddy sand | Fines | 40.70% |
| EUNIS Folk | Mud and sandy mud | Sand | 59.30% |
| Distribution | Bimodal | Gravel | 0.00% |



# APPENDIX G PARTICLE SIZE ANALYSIS

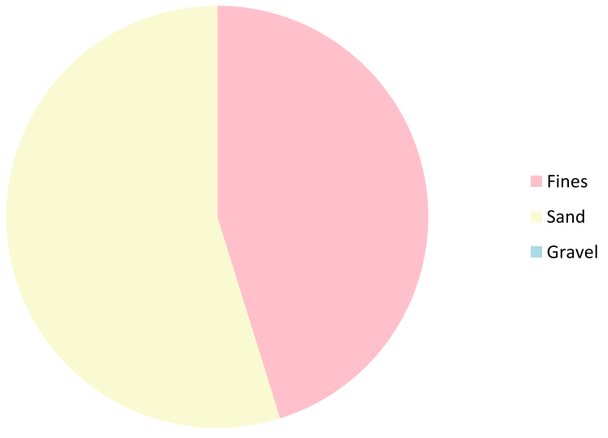
**ENV27**

| Aperature (µm) | Aperature (Phi) | Percentage Fraction | Cumulative Percentage | Sediment Description |
|---|---|---|---|---|
| 5656.85 | -2.50 | 0.00 | 0.00 | Pebble |
| 4000.00 | -2.00 | 0.00 | 0.00 | |
| 2828.43 | -1.50 | 0.00 | 0.00 | Granule |
| 2000.00 | -1.00 | 0.00 | 0.00 | |
| 1414.21 | -0.50 | 0.00 | 0.00 | Very coarse sand |
| 1000.00 | 0.00 | 0.00 | 0.00 | |
| 707.11 | 0.50 | 0.01 | 0.01 | Coarse sand |
| 500.00 | 1.00 | 0.42 | 0.43 | |
| 353.55 | 1.50 | 1.20 | 1.63 | Medium sand |
| 250.00 | 2.00 | 2.02 | 3.65 | |
| 176.78 | 2.50 | 3.32 | 6.97 | Fine sand |
| 125.00 | 3.00 | 11.04 | 18.00 | |
| 88.39 | 3.50 | 20.44 | 38.44 | Very fine sand |
| 62.50 | 4.00 | 16.38 | 54.82 | |
| 44.19 | 4.50 | 8.90 | 63.72 | Coarse silt |
| 31.25 | 5.00 | 5.34 | 69.06 | |
| 22.10 | 5.50 | 3.78 | 72.84 | Medium silt |
| 15.63 | 6.00 | 3.20 | 76.04 | |
| 11.05 | 6.50 | 3.56 | 79.60 | Fine silt |
| 7.81 | 7.00 | 3.76 | 83.35 | |
| 5.52 | 7.50 | 3.66 | 87.01 | Very fine silt |
| 3.91 | 8.00 | 3.19 | 90.20 | |
| 2.76 | 8.50 | 2.40 | 92.60 | Clay |
| 1.95 | 9.00 | 1.62 | 94.22 | |
| 1.38 | 9.50 | 1.12 | 95.34 | |
| 0.98 | 10.00 | 0.87 | 96.21 | |
| 0.69 | 10.50 | 0.75 | 96.96 | |
| 0.49 | 11.00 | 0.69 | 97.65 | |
| 0.35 | 11.50 | 0.63 | 98.28 | |
| 0.24 | 12.00 | 0.56 | 98.84 | |
| 0.17 | 12.50 | 0.46 | 99.29 | |
| 0.12 | 13.00 | 0.36 | 99.65 | |
| <0.12 | >13 | 0.35 | 100.00 | |



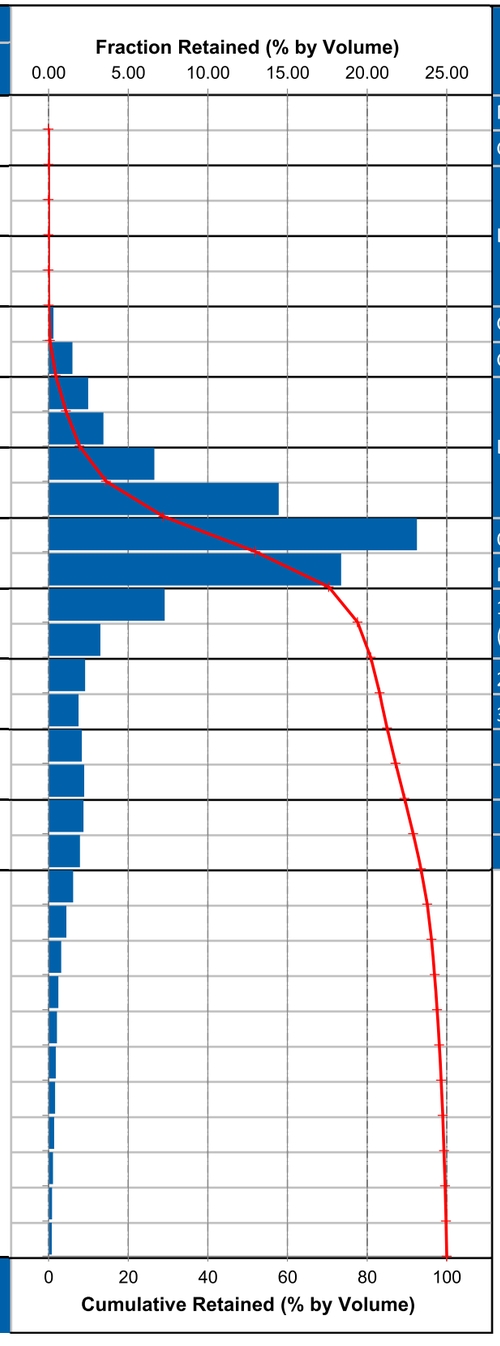

| | | | |
|---|---|---|---|
| Method of Moments | | | |
| Geometric | Mean (µm) | 39.12 | Wentworth: |
| Logarithmic | Mean (Phi) | 4.68 | Coarse silt |
| | Sorting | 2.29 | Very poor |
| | Skewness | 1.33 | Very fine |
| | Kurtosis | 4.53 | Leptokurtic |
| Graphic Folk and Ward | | | |
| Geometric | Mean (µm) | 40.76 | Wentworth: |
| Logarithmic | Mean (Phi) | 4.62 | Coarse silt |
| | Sorting | 2.13 | Very poor |
| | Skewness | 0.54 | Very fine |
| | Kurtosis | 1.10 | Mesokurtic |
| Other Statistics | Phi (ϕ) | µm | Wentworth: |
| Median (D50) | 3.85 | 69.21 | Very fine sand |
| 1st Local Maxima (Mode) | 3.50 | 88.39 | Very fine sand |
| 2nd Local Maxima | 7.00 | 7.81 | Fine silt |
| 3rd Local Maxima | - | - | - |

| Classification | | Composition | |
|---|---|---|---|
| Modified Folk | Muddy sand | Fines | 45.20% |
| EUNIS Folk | Mud and sandy mud | Sand | 54.80% |
| Distribution | Bimodal | Gravel | 0.00% |



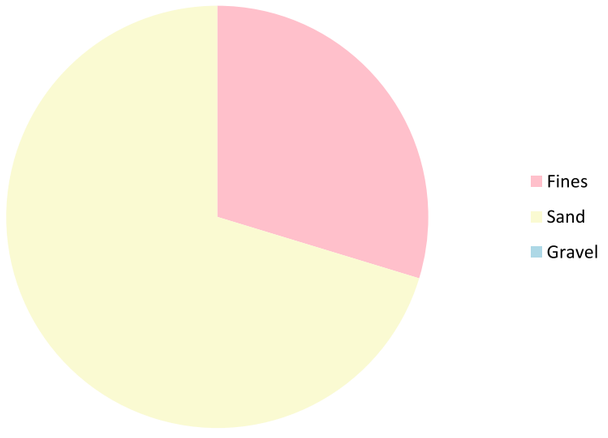
# APPENDIX G PARTICLE SIZE ANALYSIS

| ENV28 | | | | |
|---|---|---|---|---|
| Aperature (µm) | Aperature (Phi) | Percentage Fraction | Cumulative Percentage | Sediment Description |
| 5656.85 | -2.50 | 0.00 | 0.00 | Pebble |
| 4000.00 | -2.00 | 0.00 | 0.00 | |
| 2828.43 | -1.50 | 0.00 | 0.00 | Granule |
| 2000.00 | -1.00 | 0.00 | 0.00 | |
| 1414.21 | -0.50 | 0.01 | 0.01 | Very coarse sand |
| 1000.00 | 0.00 | 0.01 | 0.02 | |
| 707.11 | 0.50 | 0.31 | 0.32 | Coarse sand |
| 500.00 | 1.00 | 1.50 | 1.83 | |
| 353.55 | 1.50 | 2.49 | 4.32 | Medium sand |
| 250.00 | 2.00 | 3.44 | 7.75 | |
| 176.78 | 2.50 | 6.64 | 14.40 | Fine sand |
| 125.00 | 3.00 | 14.45 | 28.85 | |
| 88.39 | 3.50 | 23.12 | 51.97 | Very fine sand |
| 62.50 | 4.00 | 18.36 | 70.34 | |
| 44.19 | 4.50 | 7.29 | 77.62 | Coarse silt |
| 31.25 | 5.00 | 3.25 | 80.87 | |
| 22.10 | 5.50 | 2.29 | 83.17 | Medium silt |
| 15.63 | 6.00 | 1.88 | 85.05 | |
| 11.05 | 6.50 | 2.09 | 87.14 | Fine silt |
| 7.81 | 7.00 | 2.23 | 89.37 | |
| 5.52 | 7.50 | 2.20 | 91.56 | Very fine silt |
| 3.91 | 8.00 | 1.97 | 93.53 | |
| 2.76 | 8.50 | 1.55 | 95.08 | Clay |
| 1.95 | 9.00 | 1.11 | 96.19 | |
| 1.38 | 9.50 | 0.79 | 96.98 | |
| 0.98 | 10.00 | 0.62 | 97.60 | |
| 0.69 | 10.50 | 0.52 | 98.12 | |
| 0.49 | 11.00 | 0.46 | 98.58 | |
| 0.35 | 11.50 | 0.40 | 98.98 | |
| 0.24 | 12.00 | 0.34 | 99.32 | |
| 0.17 | 12.50 | 0.27 | 99.59 | |
| 0.12 | 13.00 | 0.21 | 99.80 | |
| <0.12 | >13 | 0.20 | 100.00 | |



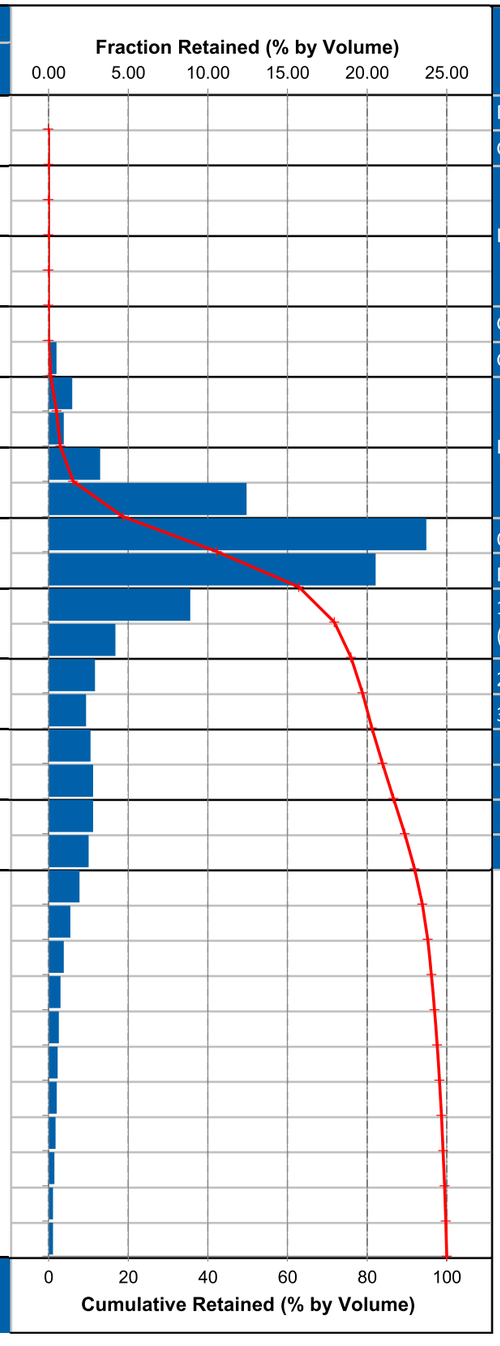

| | | | |
|---|---|---|---|
| Method of Moments | | | |
| Geometric | Mean (µm) | 62.14 | Wentworth: |
| Logarithmic | Mean (Phi) | 4.01 | Coarse silt |
| | Sorting | 2.08 | Very poor |
| | Skewness | 1.69 | Very fine |
| | Kurtosis | 6.25 | Leptokurtic |
| Graphic Folk and Ward | | | |
| Geometric | Mean (µm) | 66.47 | Wentworth: |
| Logarithmic | Mean (Phi) | 3.91 | Very fine sand |
| | Sorting | 1.83 | Poor |
| | Skewness | 0.44 | Very fine |
| | Kurtosis | 1.94 | Very leptokurtic |
| Other Statistics | Phi (ϕ) | µm | Wentworth: |
| Median (D50) | 3.46 | 91.04 | Very fine sand |
| 1st Local Maxima (Mode) | 3.50 | 88.39 | Very fine sand |
| 2nd Local Maxima | 7.00 | 7.81 | Fine silt |
| 3rd Local Maxima | - | - | - |

| Classification | | Composition | |
|---|---|---|---|
| Modified Folk | Muddy sand | Fines | 29.70% |
| EUNIS Folk | Mud and sandy mud | Sand | 70.30% |
| Distribution | Bimodal | Gravel | 0.00% |



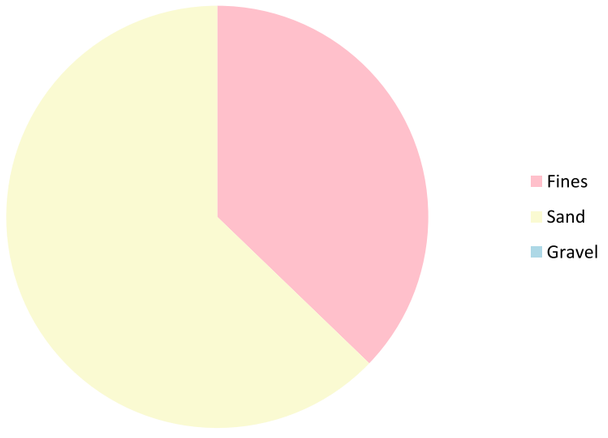
# APPENDIX G PARTICLE SIZE ANALYSIS

| ENV29 | | | | |
|---|---|---|---|---|
| Aperature (µm) | Aperature (Phi) | Percentage Fraction | Cumulative Percentage | Sediment Description |
| 5656.85 | -2.50 | 0.00 | 0.00 | Pebble |
| 4000.00 | -2.00 | 0.00 | 0.00 | |
| 2828.43 | -1.50 | 0.00 | 0.00 | Granule |
| 2000.00 | -1.00 | 0.00 | 0.00 | |
| 1414.21 | -0.50 | 0.00 | 0.00 | Very coarse sand |
| 1000.00 | 0.00 | 0.01 | 0.01 | |
| 707.11 | 0.50 | 0.00 | 0.01 | Coarse sand |
| 500.00 | 1.00 | 0.50 | 0.51 | |
| 353.55 | 1.50 | 1.48 | 1.99 | Medium sand |
| 250.00 | 2.00 | 0.95 | 2.94 | |
| 176.78 | 2.50 | 3.24 | 6.17 | Fine sand |
| 125.00 | 3.00 | 12.42 | 18.60 | |
| 88.39 | 3.50 | 23.71 | 42.31 | Very fine sand |
| 62.50 | 4.00 | 20.53 | 62.84 | |
| 44.19 | 4.50 | 8.90 | 71.74 | Coarse silt |
| 31.25 | 5.00 | 4.19 | 75.93 | |
| 22.10 | 5.50 | 2.91 | 78.84 | Medium silt |
| 15.63 | 6.00 | 2.36 | 81.20 | |
| 11.05 | 6.50 | 2.63 | 83.83 | Fine silt |
| 7.81 | 7.00 | 2.80 | 86.63 | |
| 5.52 | 7.50 | 2.79 | 89.42 | Very fine silt |
| 3.91 | 8.00 | 2.51 | 91.93 | |
| 2.76 | 8.50 | 1.95 | 93.87 | Clay |
| 1.95 | 9.00 | 1.36 | 95.23 | |
| 1.38 | 9.50 | 0.96 | 96.19 | |
| 0.98 | 10.00 | 0.74 | 96.93 | |
| 0.69 | 10.50 | 0.64 | 97.57 | |
| 0.49 | 11.00 | 0.57 | 98.14 | |
| 0.35 | 11.50 | 0.51 | 98.65 | |
| 0.24 | 12.00 | 0.44 | 99.10 | |
| 0.17 | 12.50 | 0.36 | 99.45 | |
| 0.12 | 13.00 | 0.28 | 99.73 | |
| <0.12 | >13 | 0.27 | 100.00 | |



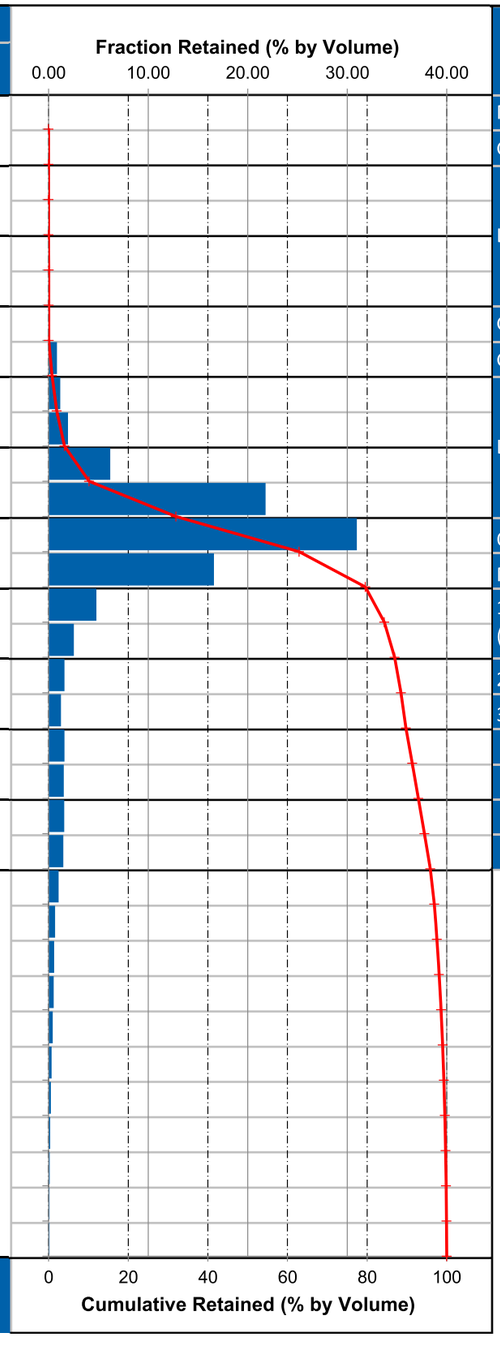

| | | | |
|---|---|---|---|
| Method of Moments | | | |
| Geometric | Mean (µm) | 47.33 | Wentworth: |
| Logarithmic | Mean (Phi) | 4.40 | Coarse silt |
| | Sorting | 2.13 | Very poor |
| | Skewness | 1.64 | Very fine |
| | Kurtosis | 5.66 | Leptokurtic |
| Graphic Folk and Ward | | | |
| Geometric | Mean (µm) | 48.33 | Wentworth: |
| Logarithmic | Mean (Phi) | 4.37 | Coarse silt |
| | Sorting | 1.91 | Poor |
| | Skewness | 0.57 | Very fine |
| | Kurtosis | 1.54 | Very leptokurtic |
| Other Statistics | Phi (ϕ) | µm | Wentworth: |
| Median (D50) | 3.69 | 77.63 | Very fine sand |
| 1st Local Maxima (Mode) | 3.50 | 88.39 | Very fine sand |
| 2nd Local Maxima | 7.00 | 7.81 | Fine silt |
| 3rd Local Maxima | 1.50 | 353.55 | Medium sand |

| Classification | | Composition | |
|---|---|---|---|
| Modified Folk | Muddy sand | Fines | 37.20% |
| EUNIS Folk | Mud and sandy mud | Sand | 62.80% |
| Distribution | Multimodal | Gravel | 0.00% |



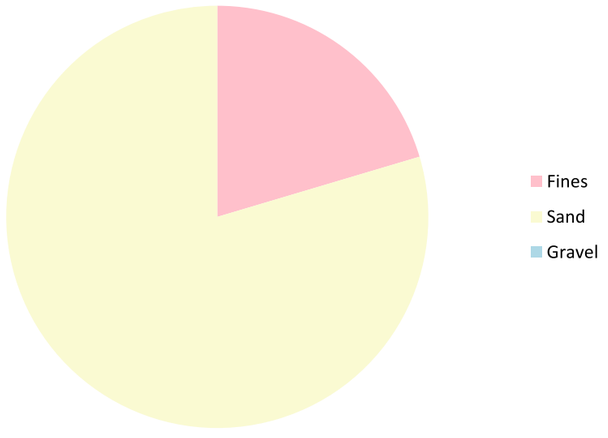
# APPENDIX G PARTICLE SIZE ANALYSIS

| ENV30 | | | | |
|---|---|---|---|---|
| Aperature (µm) | Aperature (Phi) | Percentage Fraction | Cumulative Percentage | Sediment Description |
| 5656.85 | -2.50 | 0.00 | 0.00 | Pebble |
| 4000.00 | -2.00 | 0.00 | 0.00 | |
| 2828.43 | -1.50 | 0.00 | 0.00 | Granule |
| 2000.00 | -1.00 | 0.00 | 0.00 | |
| 1414.21 | -0.50 | 0.00 | 0.01 | Very coarse sand |
| 1000.00 | 0.00 | 0.01 | 0.02 | |
| 707.11 | 0.50 | 0.00 | 0.02 | Coarse sand |
| 500.00 | 1.00 | 0.84 | 0.86 | |
| 353.55 | 1.50 | 1.17 | 2.03 | Medium sand |
| 250.00 | 2.00 | 1.94 | 3.97 | |
| 176.78 | 2.50 | 6.18 | 10.16 | Fine sand |
| 125.00 | 3.00 | 21.81 | 31.96 | |
| 88.39 | 3.50 | 30.97 | 62.93 | Very fine sand |
| 62.50 | 4.00 | 16.62 | 79.56 | |
| 44.19 | 4.50 | 4.79 | 84.35 | Coarse silt |
| 31.25 | 5.00 | 2.54 | 86.89 | |
| 22.10 | 5.50 | 1.59 | 88.48 | Medium silt |
| 15.63 | 6.00 | 1.24 | 89.73 | |
| 11.05 | 6.50 | 1.60 | 91.33 | Fine silt |
| 7.81 | 7.00 | 1.51 | 92.84 | |
| 5.52 | 7.50 | 1.57 | 94.41 | Very fine silt |
| 3.91 | 8.00 | 1.47 | 95.88 | |
| 2.76 | 8.50 | 1.00 | 96.87 | Clay |
| 1.95 | 9.00 | 0.64 | 97.51 | |
| 1.38 | 9.50 | 0.56 | 98.08 | |
| 0.98 | 10.00 | 0.52 | 98.60 | |
| 0.69 | 10.50 | 0.41 | 99.01 | |
| 0.49 | 11.00 | 0.30 | 99.32 | |
| 0.35 | 11.50 | 0.22 | 99.54 | |
| 0.24 | 12.00 | 0.16 | 99.70 | |
| 0.17 | 12.50 | 0.12 | 99.82 | |
| 0.12 | 13.00 | 0.09 | 99.91 | |
| <0.12 | >13 | 0.09 | 100.00 | |



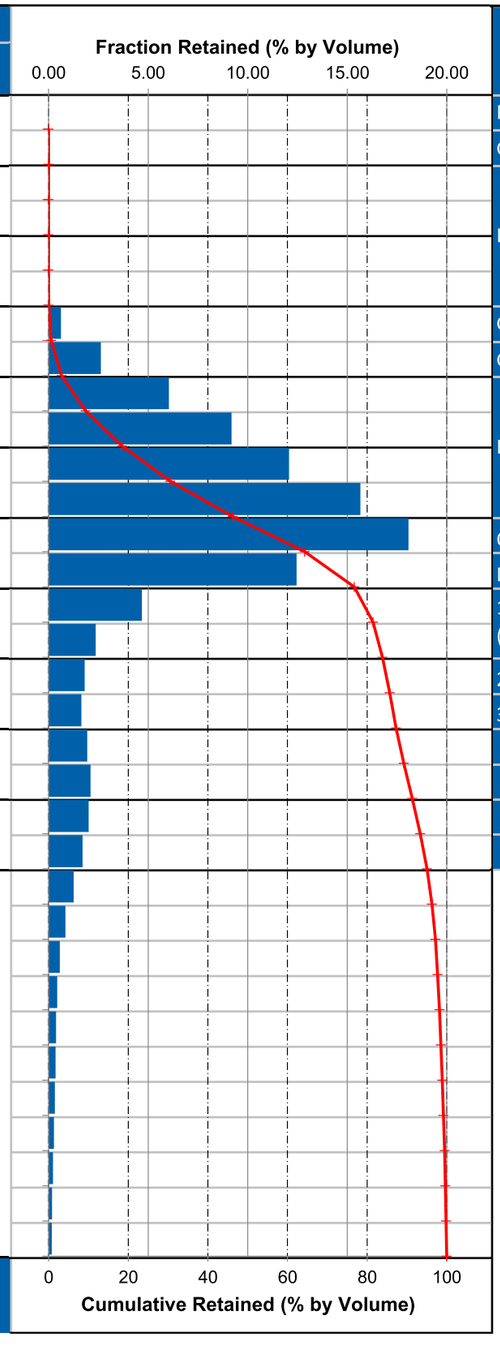

| | | | |
|---|---|---|---|
| Method of Moments | | | |
| Geometric | Mean (µm) | 75.31 | Wentworth: |
| Logarithmic | Mean (Phi) | 3.73 | Very fine sand |
| | Sorting | 1.72 | Poor |
| | Skewness | 2.25 | Very fine |
| | Kurtosis | 9.00 | Very leptokurtic |
| Graphic Folk and Ward | | | |
| Geometric | Mean (µm) | 90.69 | Wentworth: |
| Logarithmic | Mean (Phi) | 3.46 | Very fine sand |
| | Sorting | 1.31 | Poor |
| | Skewness | 0.43 | Very fine |
| | Kurtosis | 2.25 | Very leptokurtic |
| Other Statistics | Phi (ϕ) | µm | Wentworth: |
| Median (D50) | 3.29 | 102.15 | Very fine sand |
| 1st Local Maxima (Mode) | 3.50 | 88.39 | Very fine sand |
| 2nd Local Maxima | 6.50 | 11.05 | Fine silt |
| 3rd Local Maxima | - | - | - |

| Classification | | Composition | |
|---|---|---|---|
| Modified Folk | Muddy sand | Fines | 20.40% |
| EUNIS Folk | Mud and sandy mud | Sand | 79.60% |
| Distribution | Bimodal | Gravel | 0.00% |



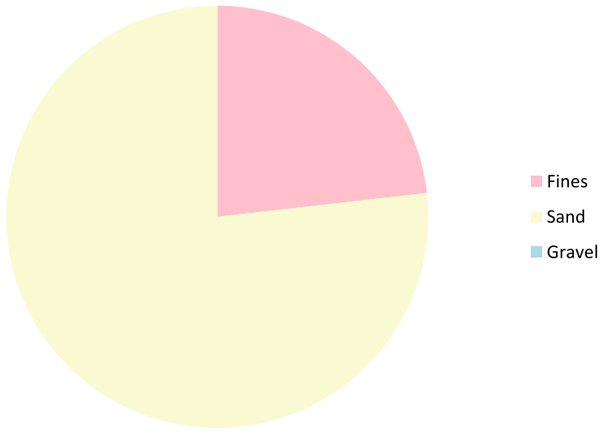
# APPENDIX G PARTICLE SIZE ANALYSIS

| ENV31 | | | | |
|---|---|---|---|---|
| Aperature (µm) | Aperature (Phi) | Percentage Fraction | Cumulative Percentage | Sediment Description |
| 5656.85 | -2.50 | 0.00 | 0.00 | Pebble |
| 4000.00 | -2.00 | 0.00 | 0.00 | |
| 2828.43 | -1.50 | 0.00 | 0.00 | Granule |
| 2000.00 | -1.00 | 0.00 | 0.00 | |
| 1414.21 | -0.50 | 0.01 | 0.01 | Very coarse sand |
| 1000.00 | 0.00 | 0.03 | 0.03 | |
| 707.11 | 0.50 | 0.62 | 0.65 | Coarse sand |
| 500.00 | 1.00 | 2.62 | 3.27 | |
| 353.55 | 1.50 | 6.04 | 9.31 | Medium sand |
| 250.00 | 2.00 | 9.19 | 18.50 | |
| 176.78 | 2.50 | 12.08 | 30.59 | Fine sand |
| 125.00 | 3.00 | 15.66 | 46.25 | |
| 88.39 | 3.50 | 18.08 | 64.33 | Very fine sand |
| 62.50 | 4.00 | 12.45 | 76.78 | |
| 44.19 | 4.50 | 4.69 | 81.47 | Coarse silt |
| 31.25 | 5.00 | 2.37 | 83.84 | |
| 22.10 | 5.50 | 1.81 | 85.65 | Medium silt |
| 15.63 | 6.00 | 1.64 | 87.29 | |
| 11.05 | 6.50 | 1.94 | 89.24 | Fine silt |
| 7.81 | 7.00 | 2.10 | 91.34 | |
| 5.52 | 7.50 | 2.01 | 93.35 | Very fine silt |
| 3.91 | 8.00 | 1.70 | 95.05 | |
| 2.76 | 8.50 | 1.26 | 96.31 | Clay |
| 1.95 | 9.00 | 0.84 | 97.15 | |
| 1.38 | 9.50 | 0.57 | 97.72 | |
| 0.98 | 10.00 | 0.43 | 98.15 | |
| 0.69 | 10.50 | 0.38 | 98.53 | |
| 0.49 | 11.00 | 0.34 | 98.87 | |
| 0.35 | 11.50 | 0.31 | 99.18 | |
| 0.24 | 12.00 | 0.27 | 99.45 | |
| 0.17 | 12.50 | 0.22 | 99.67 | |
| 0.12 | 13.00 | 0.17 | 99.84 | |
| <0.12 | >13 | 0.16 | 100.00 | |



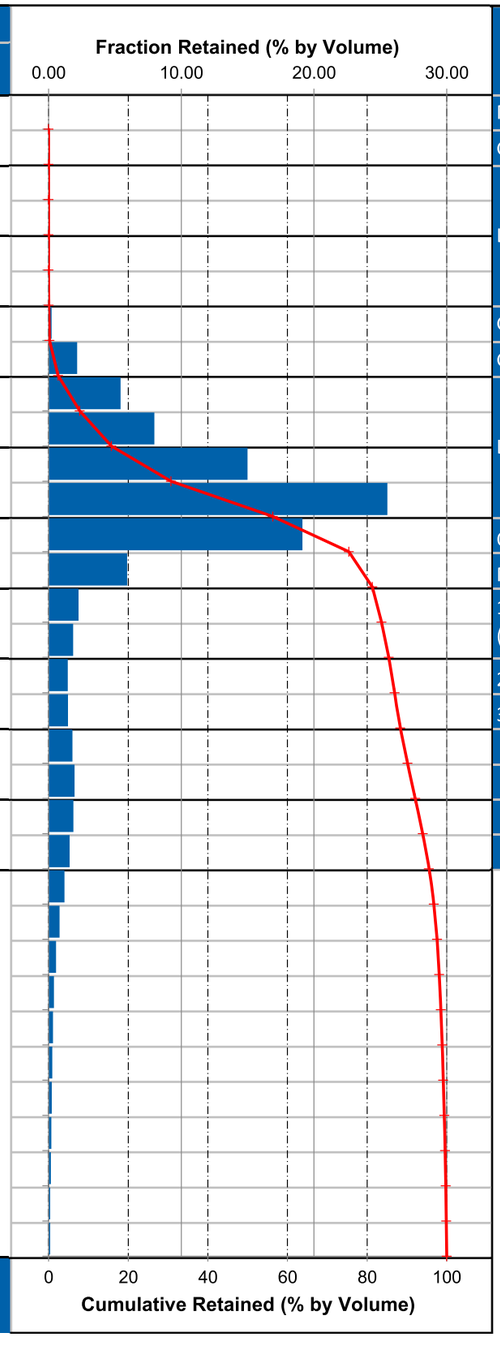

| | | | |
|---|---|---|---|
| Method of Moments | | | |
| Geometric | Mean (µm) | 85.92 | Wentworth: |
| Logarithmic | Mean (Phi) | 3.54 | Very fine sand |
| | Sorting | 2.09 | Very poor |
| | Skewness | 1.69 | Very fine |
| | Kurtosis | 6.41 | Leptokurtic |
| Graphic Folk and Ward | | | |
| Geometric | Mean (µm) | 98.95 | Wentworth: |
| Logarithmic | Mean (Phi) | 3.34 | Very fine sand |
| | Sorting | 1.83 | Poor |
| | Skewness | 0.32 | Very fine |
| | Kurtosis | 1.69 | Very leptokurtic |
| Other Statistics | Phi (ϕ) | µm | Wentworth: |
| Median (D50) | 3.10 | 116.33 | Very fine sand |
| 1st Local Maxima (Mode) | 3.50 | 88.39 | Very fine sand |
| 2nd Local Maxima | 7.00 | 7.81 | Fine silt |
| 3rd Local Maxima | - | - | - |

| Classification | | Composition | |
|---|---|---|---|
| Modified Folk | Muddy sand | Fines | 23.20% |
| EUNIS Folk | Mud and sandy mud | Sand | 76.80% |
| Distribution | Bimodal | Gravel | 0.00% |



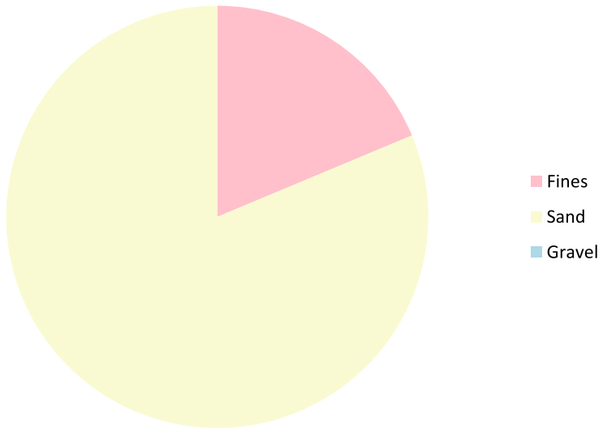
# APPENDIX G PARTICLE SIZE ANALYSIS

| ENV33 | | | | |
|---|---|---|---|---|
| Aperature (µm) | Aperature (Phi) | Percentage Fraction | Cumulative Percentage | Sediment Description |
| 5656.85 | -2.50 | 0.00 | 0.00 | Pebble |
| 4000.00 | -2.00 | 0.00 | 0.00 | |
| 2828.43 | -1.50 | 0.00 | 0.00 | Granule |
| 2000.00 | -1.00 | 0.00 | 0.00 | |
| 1414.21 | -0.50 | 0.00 | 0.00 | Very coarse sand |
| 1000.00 | 0.00 | 0.01 | 0.02 | |
| 707.11 | 0.50 | 0.22 | 0.24 | Coarse sand |
| 500.00 | 1.00 | 2.15 | 2.38 | |
| 353.55 | 1.50 | 5.42 | 7.80 | Medium sand |
| 250.00 | 2.00 | 7.97 | 15.77 | |
| 176.78 | 2.50 | 14.99 | 30.77 | Fine sand |
| 125.00 | 3.00 | 25.53 | 56.30 | |
| 88.39 | 3.50 | 19.12 | 75.42 | Very fine sand |
| 62.50 | 4.00 | 5.91 | 81.33 | |
| 44.19 | 4.50 | 2.26 | 83.59 | Coarse silt |
| 31.25 | 5.00 | 1.86 | 85.45 | |
| 22.10 | 5.50 | 1.44 | 86.88 | Medium silt |
| 15.63 | 6.00 | 1.46 | 88.34 | |
| 11.05 | 6.50 | 1.80 | 90.14 | Fine silt |
| 7.81 | 7.00 | 1.96 | 92.10 | |
| 5.52 | 7.50 | 1.86 | 93.96 | Very fine silt |
| 3.91 | 8.00 | 1.58 | 95.55 | |
| 2.76 | 8.50 | 1.19 | 96.74 | Clay |
| 1.95 | 9.00 | 0.82 | 97.56 | |
| 1.38 | 9.50 | 0.56 | 98.12 | |
| 0.98 | 10.00 | 0.41 | 98.52 | |
| 0.69 | 10.50 | 0.33 | 98.85 | |
| 0.49 | 11.00 | 0.28 | 99.14 | |
| 0.35 | 11.50 | 0.25 | 99.38 | |
| 0.24 | 12.00 | 0.21 | 99.59 | |
| 0.17 | 12.50 | 0.16 | 99.76 | |
| 0.12 | 13.00 | 0.13 | 99.88 | |
| <0.12 | >13 | 0.12 | 100.00 | |




| | | | |
|---|---|---|---|
| Method of Moments | | | |
| Geometric | Mean (µm) | 95.91 | Wentworth: |
| Logarithmic | Mean (Phi) | 3.38 | Very fine sand |
| | Sorting | 1.98 | Poor |
| | Skewness | 1.95 | Very fine |
| | Kurtosis | 7.25 | Leptokurtic |
| Graphic Folk and Ward | | | |
| Geometric | Mean (µm) | 111.48 | Wentworth: |
| Logarithmic | Mean (Phi) | 3.17 | Very fine sand |
| | Sorting | 1.65 | Poor |
| | Skewness | 0.42 | Very fine |
| | Kurtosis | 2.28 | Very leptokurtic |
| Other Statistics | Phi (ϕ) | µm | Wentworth: |
| Median (D50) | 2.88 | 136.15 | Fine sand |
| 1st Local Maxima (Mode) | 3.00 | 125.00 | Fine sand |
| 2nd Local Maxima | 7.00 | 7.81 | Fine silt |
| 3rd Local Maxima | - | - | - |

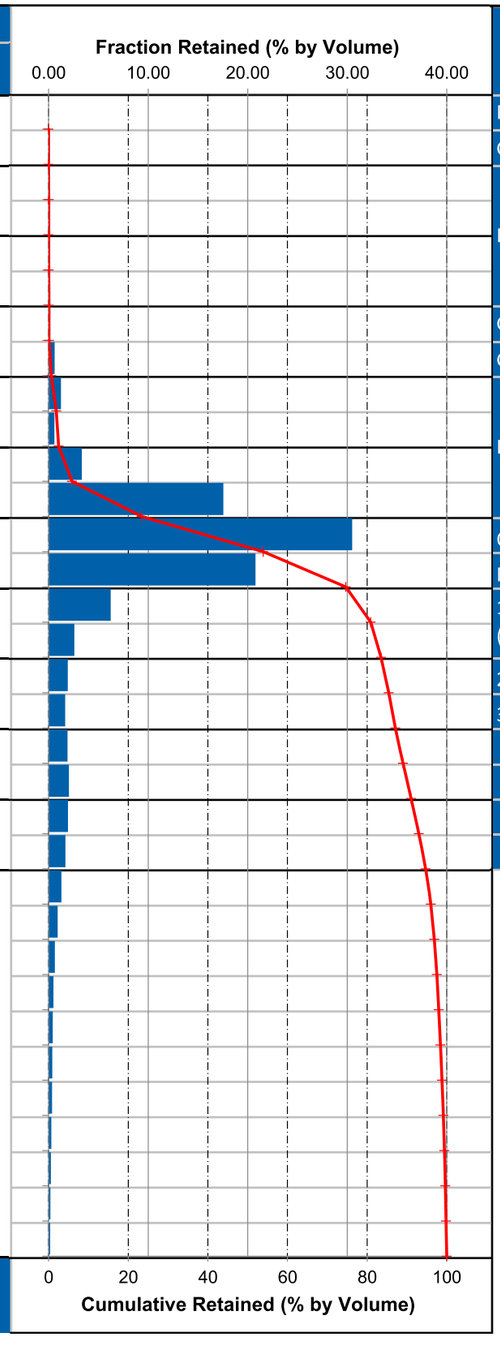
| Classification | | Composition | |
|---|---|---|---|
| Modified Folk | Muddy sand | Fines | 18.70% |
| EUNIS Folk | Sand and muddy sand | Sand | 81.30% |
| Distribution | Bimodal | Gravel | 0.00% |



# APPENDIX G PARTICLE SIZE ANALYSIS

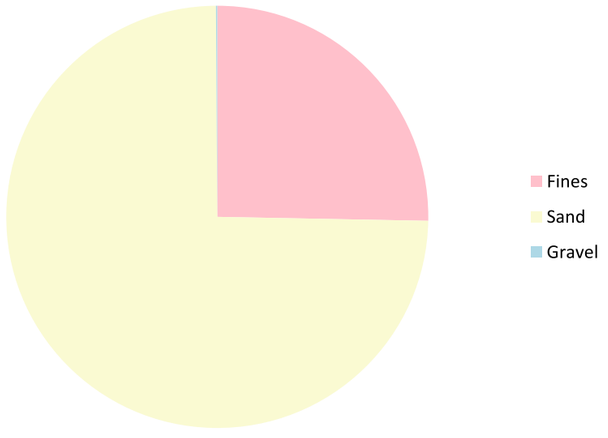
**ENV34**

| Aperature (µm) | Aperature (Phi) | Percentage Fraction | Cumulative Percentage | Sediment Description |
|---|---|---|---|---|
| 5656.85 | -2.50 | 0.00 | 0.00 | Pebble |
| 4000.00 | -2.00 | 0.01 | 0.01 | |
| 2828.43 | -1.50 | 0.03 | 0.04 | Granule |
| 2000.00 | -1.00 | 0.02 | 0.06 | |
| 1414.21 | -0.50 | 0.00 | 0.06 | Very coarse sand |
| 1000.00 | 0.00 | 0.02 | 0.08 | |
| 707.11 | 0.50 | 0.01 | 0.10 | Coarse sand |
| 500.00 | 1.00 | 0.61 | 0.71 | |
| 353.55 | 1.50 | 1.23 | 1.94 | Medium sand |
| 250.00 | 2.00 | 0.57 | 2.51 | |
| 176.78 | 2.50 | 3.33 | 5.85 | Fine sand |
| 125.00 | 3.00 | 17.54 | 23.39 | |
| 88.39 | 3.50 | 30.50 | 53.89 | Very fine sand |
| 62.50 | 4.00 | 20.79 | 74.68 | |
| 44.19 | 4.50 | 6.25 | 80.93 | Coarse silt |
| 31.25 | 5.00 | 2.59 | 83.51 | |
| 22.10 | 5.50 | 1.93 | 85.44 | Medium silt |
| 15.63 | 6.00 | 1.66 | 87.11 | |
| 11.05 | 6.50 | 1.90 | 89.01 | Fine silt |
| 7.81 | 7.00 | 2.05 | 91.05 | |
| 5.52 | 7.50 | 1.96 | 93.01 | Very fine silt |
| 3.91 | 8.00 | 1.68 | 94.69 | |
| 2.76 | 8.50 | 1.28 | 95.97 | Clay |
| 1.95 | 9.00 | 0.90 | 96.87 | |
| 1.38 | 9.50 | 0.64 | 97.51 | |
| 0.98 | 10.00 | 0.49 | 98.00 | |
| 0.69 | 10.50 | 0.42 | 98.43 | |
| 0.49 | 11.00 | 0.38 | 98.81 | |
| 0.35 | 11.50 | 0.33 | 99.14 | |
| 0.24 | 12.00 | 0.29 | 99.43 | |
| 0.17 | 12.50 | 0.23 | 99.66 | |
| 0.12 | 13.00 | 0.18 | 99.83 | |
| <0.12 | >13 | 0.17 | 100.00 | |



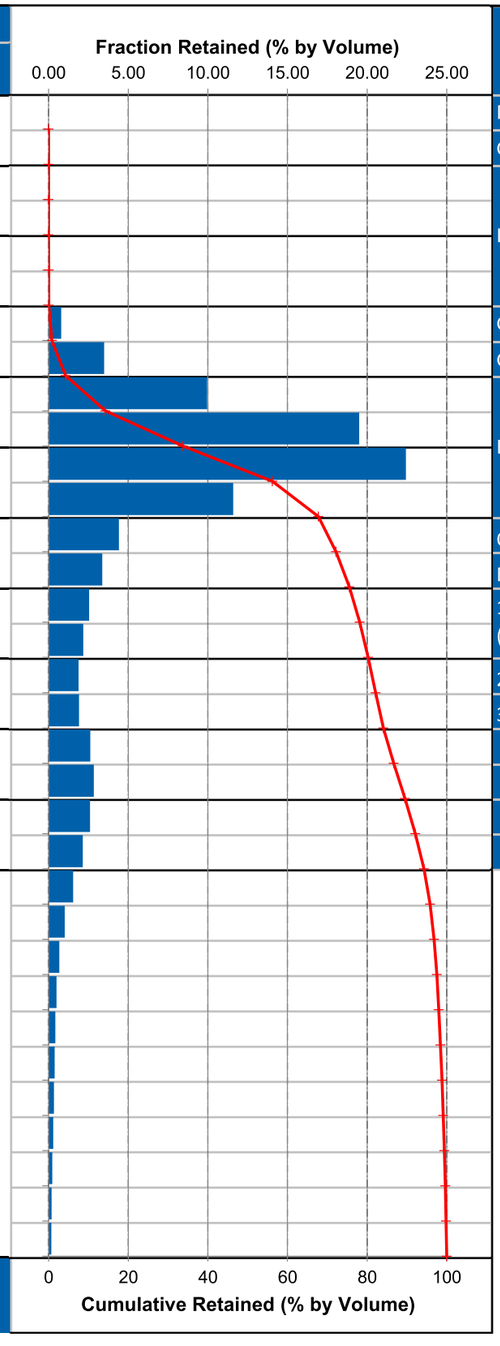

| | | | |
|---|---|---|---|
| Method of Moments | | | |
| Geometric | Mean (µm) | 62.88 | Wentworth: |
| Logarithmic | Mean (Phi) | 3.99 | Very fine sand |
| | Sorting | 1.86 | Poor |
| | Skewness | 2.10 | Very fine |
| | Kurtosis | 8.11 | Very leptokurtic |
| Graphic Folk and Ward | | | |
| Geometric | Mean (µm) | 72.60 | Wentworth: |
| Logarithmic | Mean (Phi) | 3.78 | Very fine sand |
| | Sorting | 1.46 | Poor |
| | Skewness | 0.54 | Very fine |
| | Kurtosis | 2.36 | Very leptokurtic |
| Other Statistics | Phi (ϕ) | µm | Wentworth: |
| Median (D50) | 3.44 | 92.39 | Very fine sand |
| 1st Local Maxima (Mode) | 3.50 | 88.39 | Very fine sand |
| 2nd Local Maxima | 7.00 | 7.81 | Fine silt |
| 3rd Local Maxima | 1.50 | 353.55 | Medium sand |

| Classification | | Composition | |
|---|---|---|---|
| Modified Folk | Muddy sand | Fines | 25.30% |
| EUNIS Folk | Mud and sandy mud | Sand | 74.60% |
| Distribution | Multimodal | Gravel | 0.10% |



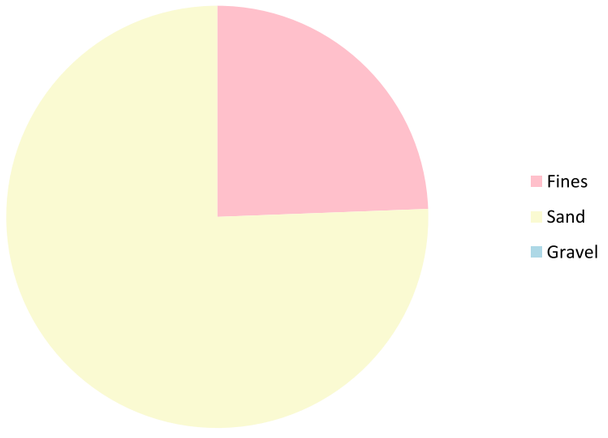
# APPENDIX G PARTICLE SIZE ANALYSIS

| ENV35 | | | | |
|---|---|---|---|---|
| Aperature (µm) | Aperature (Phi) | Percentage Fraction | Cumulative Percentage | Sediment Description |
| 5656.85 | -2.50 | 0.00 | 0.00 | Pebble |
| 4000.00 | -2.00 | 0.00 | 0.00 | |
| 2828.43 | -1.50 | 0.00 | 0.00 | Granule |
| 2000.00 | -1.00 | 0.00 | 0.00 | |
| 1414.21 | -0.50 | 0.01 | 0.01 | Very coarse sand |
| 1000.00 | 0.00 | 0.01 | 0.02 | |
| 707.11 | 0.50 | 0.79 | 0.81 | Coarse sand |
| 500.00 | 1.00 | 3.48 | 4.29 | |
| 353.55 | 1.50 | 9.96 | 14.25 | Medium sand |
| 250.00 | 2.00 | 19.50 | 33.75 | |
| 176.78 | 2.50 | 22.43 | 56.18 | Fine sand |
| 125.00 | 3.00 | 11.60 | 67.78 | |
| 88.39 | 3.50 | 4.41 | 72.19 | Very fine sand |
| 62.50 | 4.00 | 3.37 | 75.56 | |
| 44.19 | 4.50 | 2.55 | 78.10 | Coarse silt |
| 31.25 | 5.00 | 2.17 | 80.28 | |
| 22.10 | 5.50 | 1.88 | 82.15 | Medium silt |
| 15.63 | 6.00 | 1.91 | 84.07 | |
| 11.05 | 6.50 | 2.62 | 86.68 | Fine silt |
| 7.81 | 7.00 | 2.83 | 89.52 | |
| 5.52 | 7.50 | 2.61 | 92.13 | Very fine silt |
| 3.91 | 8.00 | 2.14 | 94.27 | |
| 2.76 | 8.50 | 1.54 | 95.81 | Clay |
| 1.95 | 9.00 | 1.02 | 96.82 | |
| 1.38 | 9.50 | 0.67 | 97.50 | |
| 0.98 | 10.00 | 0.50 | 98.00 | |
| 0.69 | 10.50 | 0.42 | 98.42 | |
| 0.49 | 11.00 | 0.37 | 98.79 | |
| 0.35 | 11.50 | 0.33 | 99.12 | |
| 0.24 | 12.00 | 0.29 | 99.41 | |
| 0.17 | 12.50 | 0.23 | 99.65 | |
| 0.12 | 13.00 | 0.18 | 99.83 | |
| <0.12 | >13 | 0.17 | 100.00 | |




| | | | |
|---|---|---|---|
| Method of Moments | | | |
| Geometric | Mean (µm) | 103.44 | Wentworth: |
| Logarithmic | Mean (Phi) | 3.27 | Very fine sand |
| | Sorting | 2.37 | Very poor |
| | Skewness | 1.60 | Very fine |
| | Kurtosis | 5.11 | Leptokurtic |
| Graphic Folk and Ward | | | |
| Geometric | Mean (µm) | 101.77 | Wentworth: |
| Logarithmic | Mean (Phi) | 3.30 | Very fine sand |
| | Sorting | 2.20 | Very poor |
| | Skewness | 0.63 | Very fine |
| | Kurtosis | 1.38 | Leptokurtic |
| Other Statistics | Phi (ϕ) | µm | Wentworth: |
| Median (D50) | 2.36 | 194.49 | Fine sand |
| 1st Local Maxima (Mode) | 2.50 | 176.78 | Fine sand |
| 2nd Local Maxima | 7.00 | 7.81 | Fine silt |
| 3rd Local Maxima | - | - | - |

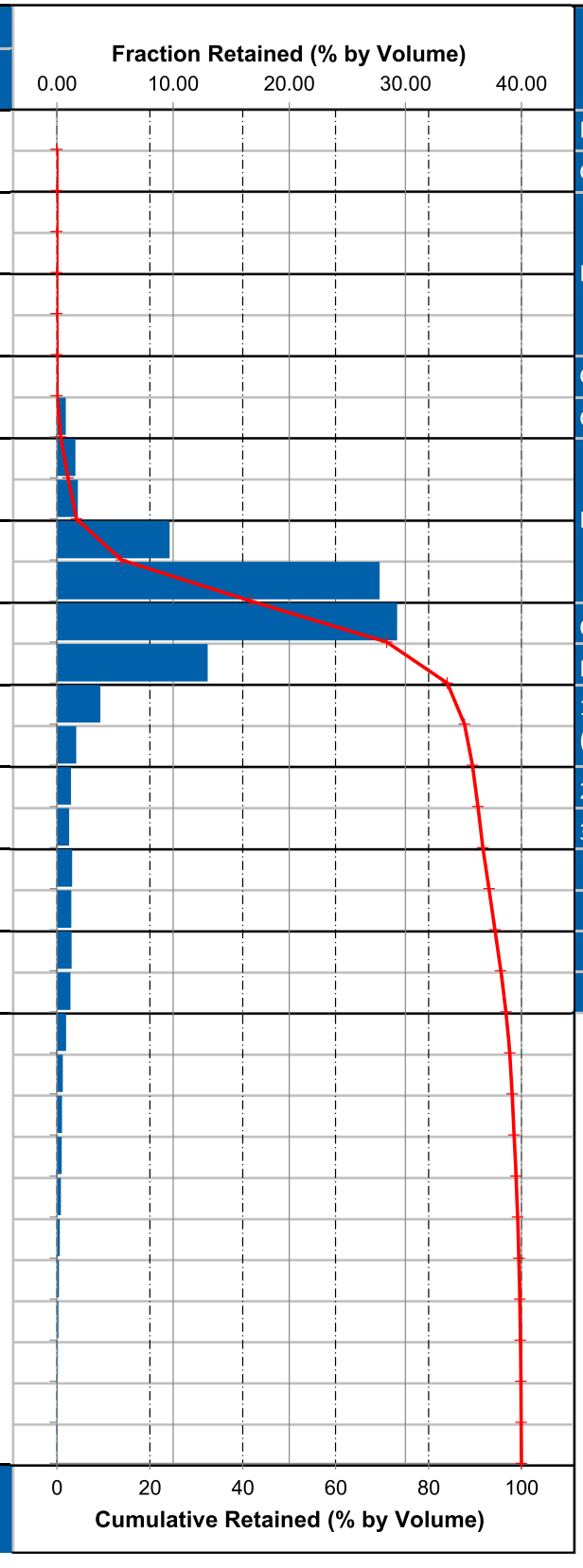
| Classification | | Composition | |
|---|---|---|---|
| Modified Folk | Muddy sand | Fines | 24.40% |
| EUNIS Folk | Mud and sandy mud | Sand | 75.60% |
| Distribution | Bimodal | Gravel | 0.00% |



# APPENDIX G PARTICLE SIZE ANALYSIS

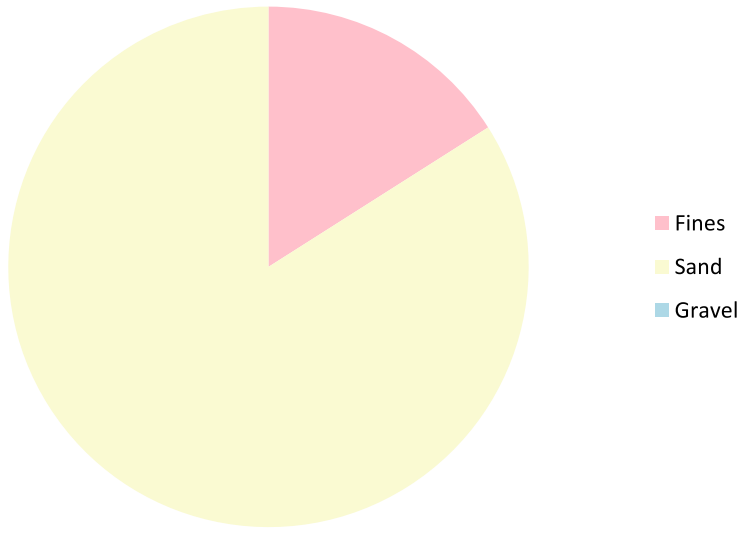
**ENV36**

| Aperature (µm) | Aperature (Phi) | Percentage Fraction | Cumulative Percentage | Sediment Description |
|---|---|---|---|---|
| 5656.85 | -2.50 | 0.00 | 0.00 | Pebble |
| 4000.00 | -2.00 | 0.00 | 0.00 | |
| 2828.43 | -1.50 | 0.00 | 0.00 | Granule |
| 2000.00 | -1.00 | 0.00 | 0.00 | |
| 1414.21 | -0.50 | 0.00 | 0.00 | Very coarse sand |
| 1000.00 | 0.00 | 0.01 | 0.01 | |
| 707.11 | 0.50 | 0.00 | 0.01 | Coarse sand |
| 500.00 | 1.00 | 0.78 | 0.79 | |
| 353.55 | 1.50 | 1.60 | 2.39 | Medium sand |
| 250.00 | 2.00 | 1.81 | 4.20 | |
| 176.78 | 2.50 | 9.70 | 13.91 | Fine sand |
| 125.00 | 3.00 | 27.80 | 41.70 | |
| 88.39 | 3.50 | 29.30 | 71.00 | Very fine sand |
| 62.50 | 4.00 | 12.99 | 84.00 | |
| 44.19 | 4.50 | 3.75 | 87.75 | Coarse silt |
| 31.25 | 5.00 | 1.68 | 89.43 | |
| 22.10 | 5.50 | 1.22 | 90.65 | Medium silt |
| 15.63 | 6.00 | 1.06 | 91.71 | |
| 11.05 | 6.50 | 1.31 | 93.02 | Fine silt |
| 7.81 | 7.00 | 1.25 | 94.27 | |
| 5.52 | 7.50 | 1.27 | 95.54 | Very fine silt |
| 3.91 | 8.00 | 1.17 | 96.70 | |
| 2.76 | 8.50 | 0.79 | 97.49 | Clay |
| 1.95 | 9.00 | 0.50 | 97.99 | |
| 1.38 | 9.50 | 0.44 | 98.42 | |
| 0.98 | 10.00 | 0.41 | 98.84 | |
| 0.69 | 10.50 | 0.34 | 99.18 | |
| 0.49 | 11.00 | 0.26 | 99.44 | |
| 0.35 | 11.50 | 0.19 | 99.63 | |
| 0.24 | 12.00 | 0.14 | 99.76 | |
| 0.17 | 12.50 | 0.10 | 99.86 | |
| 0.12 | 13.00 | 0.07 | 99.93 | |
| <0.12 | >13 | 0.07 | 100.00 | |



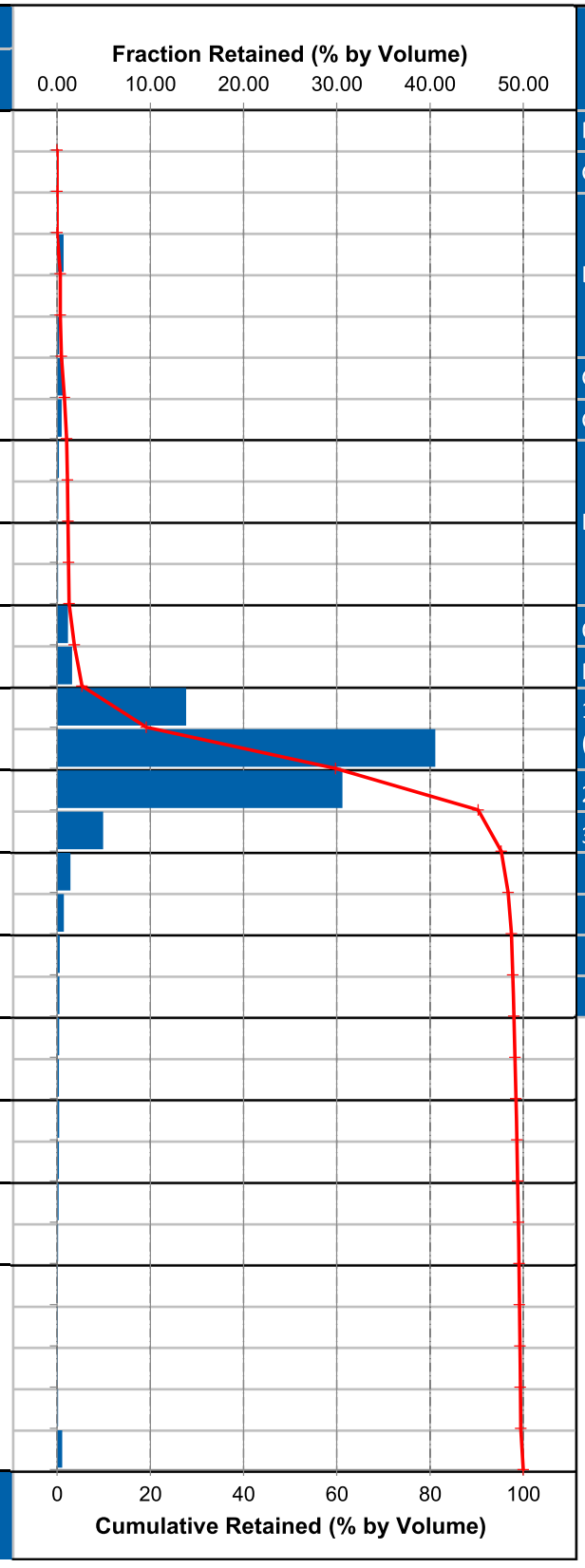

| | | | |
|---|---|---|---|
| Method of Moments | | | |
| Geometric | Mean (µm) | 87.66 | Wentworth: |
| Logarithmic | Mean (Phi) | 3.51 | Very fine sand |
| | Sorting | 1.62 | Poor |
| | Skewness | 2.51 | Very fine |
| | Kurtosis | 10.74 | Very leptokurtic |
| Graphic Folk and Ward | | | |
| Geometric | Mean (µm) | 106.84 | Wentworth: |
| Logarithmic | Mean (Phi) | 3.23 | Very fine sand |
| | Sorting | 1.16 | Poor |
| | Skewness | 0.38 | Very fine |
| | Kurtosis | 2.25 | Very leptokurtic |
| Other Statistics | Phi (ϕ) | µm | Wentworth: |
| Median (D50) | 3.14 | 113.31 | Very fine sand |
| 1st Local Maxima (Mode) | 3.50 | 88.39 | Very fine sand |
| 2nd Local Maxima | 6.50 | 11.05 | Fine silt |
| 3rd Local Maxima | - | - | - |

| Classification | | Composition | |
|---|---|---|---|
| Modified Folk | Muddy sand | Fines | 16.00% |
| EUNIS Folk | Sand and muddy sand | Sand | 84.00% |
| Distribution | Bimodal | Gravel | 0.00% |



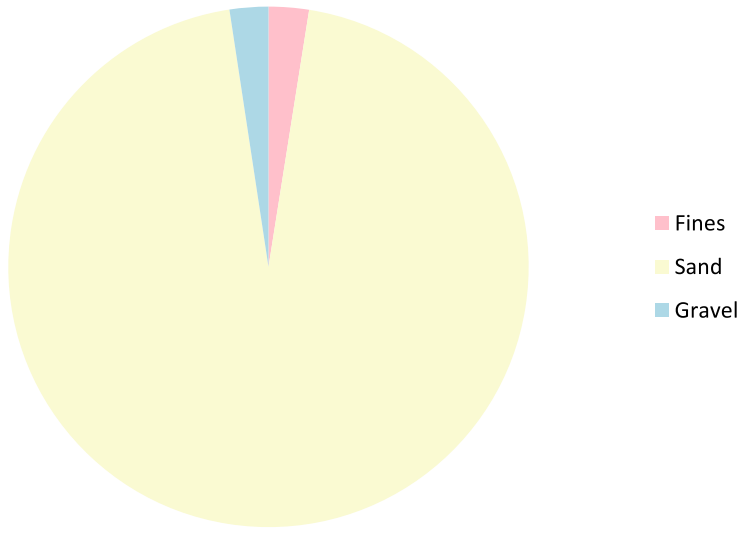
# APPENDIX G PARTICLE SIZE ANALYSIS

| ENV53 | | | | |
|---|---|---|---|---|
| Aperature (µm) | Aperature (Phi) | Percentage Fraction | Cumulative Percentage | Sediment Description |
| 45254.83 | -5.50 | 0.00 | 0.00 | |
| 32000.00 | -5.00 | 0.00 | 0.00 | |
| 22627.42 | -4.50 | 0.00 | 0.00 | |
| 16000.00 | -4.00 | 0.69 | 0.69 | Pebble |
| 11313.71 | -3.50 | 0.00 | 0.69 | |
| 8000.00 | -3.00 | 0.22 | 0.92 | |
| 5656.85 | -2.50 | 0.65 | 1.56 | |
| 4000.00 | -2.00 | 0.49 | 2.05 | |
| 2828.43 | -1.50 | 0.19 | 2.24 | Granule |
| 2000.00 | -1.00 | 0.13 | 2.36 | |
| 1414.21 | -0.50 | 0.10 | 2.47 | Very coarse sand |
| 1000.00 | 0.00 | 0.09 | 2.56 | |
| 707.11 | 0.50 | 1.16 | 3.72 | Coarse sand |
| 500.00 | 1.00 | 1.60 | 5.32 | |
| 353.55 | 1.50 | 13.83 | 19.15 | Medium sand |
| 250.00 | 2.00 | 40.58 | 59.73 | |
| 176.78 | 2.50 | 30.62 | 90.35 | Fine sand |
| 125.00 | 3.00 | 4.95 | 95.29 | |
| 88.39 | 3.50 | 1.44 | 96.74 | Very fine sand |
| 62.50 | 4.00 | 0.73 | 97.47 | |
| 44.19 | 4.50 | 0.28 | 97.75 | Coarse silt |
| 31.25 | 5.00 | 0.25 | 98.00 | |
| 22.10 | 5.50 | 0.21 | 98.21 | Medium silt |
| 15.63 | 6.00 | 0.20 | 98.41 | |
| 11.05 | 6.50 | 0.22 | 98.63 | Fine silt |
| 7.81 | 7.00 | 0.20 | 98.82 | |
| 5.52 | 7.50 | 0.16 | 98.99 | Very fine silt |
| 3.91 | 8.00 | 0.12 | 99.10 | |
| 2.76 | 8.50 | 0.08 | 99.19 | Clay |
| 1.95 | 9.00 | 0.08 | 99.26 | |
| 1.38 | 9.50 | 0.09 | 99.35 | |
| 0.98 | 10.00 | 0.11 | 99.46 | |
| <1.0 | >10 | 0.54 | 100.00 | |



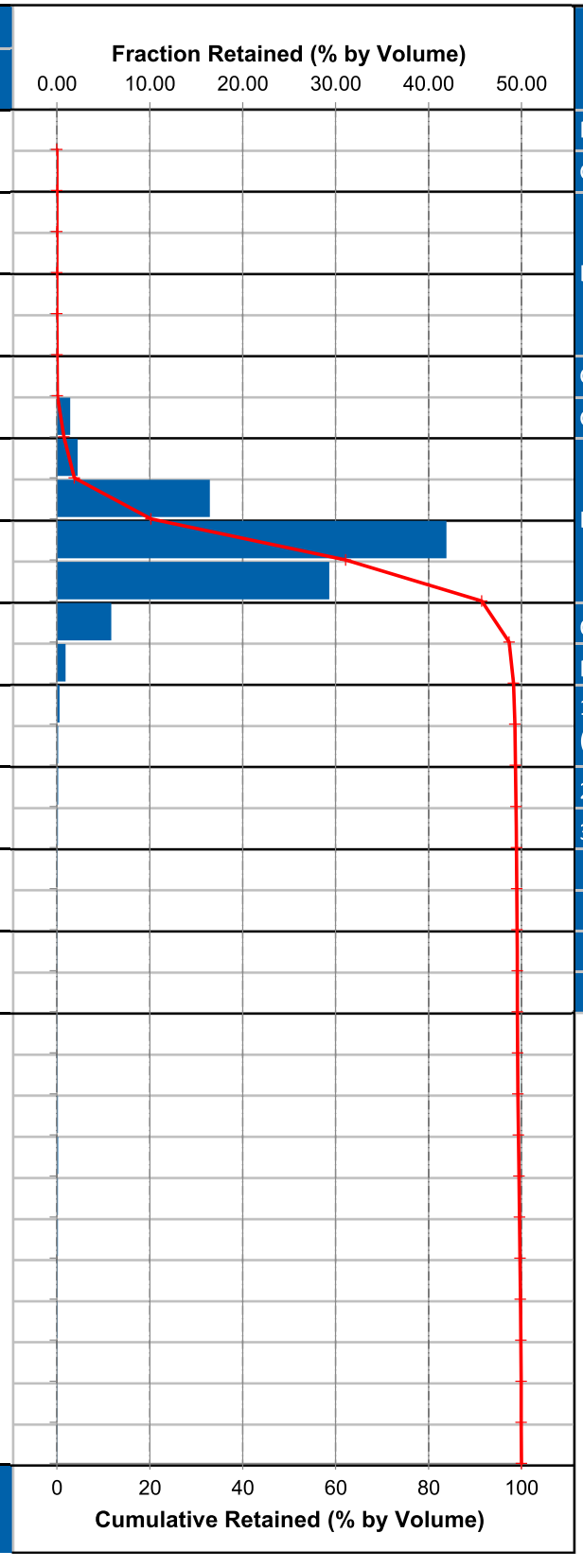

| | | | |
|---|---|---|---|
| Method of Moments | | | |
| Geometric | Mean (µm) | 265.33 | Wentworth: |
| Logarithmic | Mean (Phi) | 1.91 | Medium sand |
| | Sorting | 1.34 | Poor |
| | Skewness | 1.77 | Very fine |
| | Kurtosis | 25.04 | Very leptokurtic |
| Graphic Folk and Ward | | | |
| Geometric | Mean (µm) | 270.26 | Wentworth: |
| Logarithmic | Mean (Phi) | 1.89 | Medium sand |
| | Sorting | 0.57 | Moderately well |
| | Skewness | 0.04 | Symmetrical |
| | Kurtosis | 1.25 | Leptokurtic |
| Other Statistics | Phi (ϕ) | µm | Wentworth: |
| Median (D50) | 1.88 | 271.66 | Medium sand |
| 1st Local Maxima (Mode) | 2.00 | 250.00 | Medium sand |
| 2nd Local Maxima | - | - | - |
| 3rd Local Maxima | - | - | - |

| Classification | | Composition | |
|---|---|---|---|
| Modified Folk | Slightly gravelly sand | Fines | 2.50% |
| EUNIS Folk | Sand and muddy sand | Sand | 95.10% |
| Distribution | Unimodal | Gravel | 2.40% |



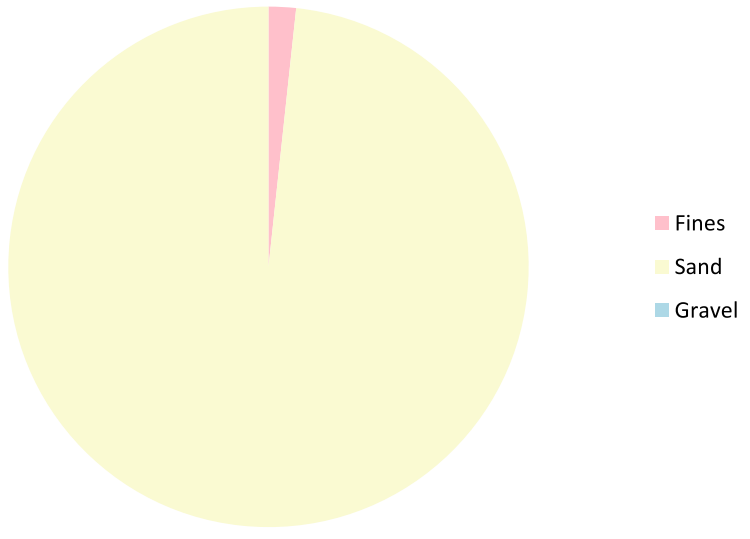
# APPENDIX G PARTICLE SIZE ANALYSIS

| ENV57 | | | | |
|---|---|---|---|---|
| Aperature (µm) | Aperature (Phi) | Percentage Fraction | Cumulative Percentage | Sediment Description |
| 5656.85 | -2.50 | 0.00 | 0.00 | Pebble |
| 4000.00 | -2.00 | 0.00 | 0.00 | |
| 2828.43 | -1.50 | 0.00 | 0.00 | Granule |
| 2000.00 | -1.00 | 0.00 | 0.00 | |
| 1414.21 | -0.50 | 0.00 | 0.01 | Very coarse sand |
| 1000.00 | 0.00 | 0.02 | 0.02 | |
| 707.11 | 0.50 | 0.07 | 0.09 | Coarse sand |
| 500.00 | 1.00 | 1.45 | 1.53 | |
| 353.55 | 1.50 | 2.23 | 3.76 | Medium sand |
| 250.00 | 2.00 | 16.47 | 20.23 | |
| 176.78 | 2.50 | 41.92 | 62.16 | Fine sand |
| 125.00 | 3.00 | 29.32 | 91.48 | |
| 88.39 | 3.50 | 5.85 | 97.33 | Very fine sand |
| 62.50 | 4.00 | 0.95 | 98.27 | |
| 44.19 | 4.50 | 0.29 | 98.57 | Coarse silt |
| 31.25 | 5.00 | 0.15 | 98.72 | |
| 22.10 | 5.50 | 0.13 | 98.84 | Medium silt |
| 15.63 | 6.00 | 0.10 | 98.95 | |
| 11.05 | 6.50 | 0.07 | 99.02 | Fine silt |
| 7.81 | 7.00 | 0.05 | 99.07 | |
| 5.52 | 7.50 | 0.04 | 99.11 | Very fine silt |
| 3.91 | 8.00 | 0.03 | 99.14 | |
| 2.76 | 8.50 | 0.04 | 99.18 | Clay |
| 1.95 | 9.00 | 0.07 | 99.24 | |
| 1.38 | 9.50 | 0.10 | 99.35 | |
| 0.98 | 10.00 | 0.12 | 99.47 | |
| 0.69 | 10.50 | 0.12 | 99.59 | |
| 0.49 | 11.00 | 0.11 | 99.70 | |
| 0.35 | 11.50 | 0.09 | 99.79 | |
| 0.24 | 12.00 | 0.07 | 99.86 | |
| 0.17 | 12.50 | 0.05 | 99.91 | |
| 0.12 | 13.00 | 0.04 | 99.96 | |
| <0.12 | >13 | 0.04 | 100.00 | |



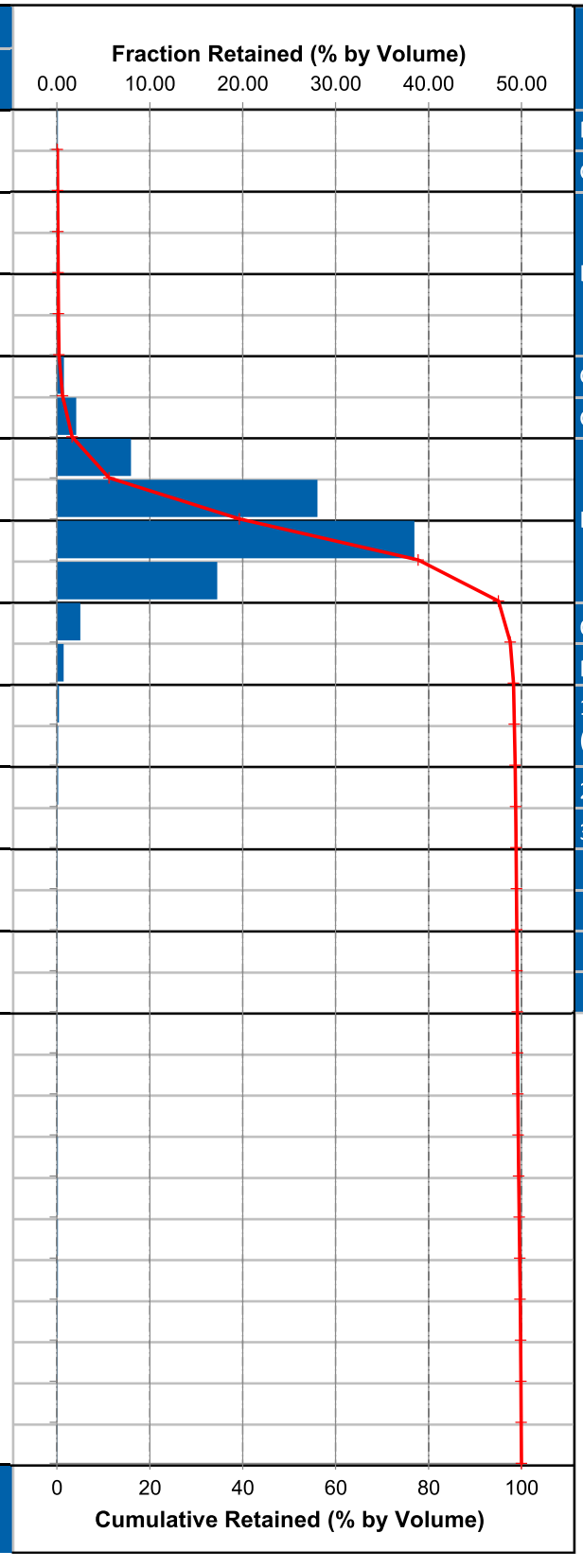

| | | | |
|---|---|---|---|
| Method of Moments | | | |
| Geometric | Mean (µm) | 184.51 | Wentworth: |
| Logarithmic | Mean (Phi) | 2.44 | Fine sand |
| | Sorting | 0.95 | Moderately |
| | Skewness | 5.89 | Very fine |
| | Kurtosis | 53.95 | Very leptokurtic |
| Graphic Folk and Ward | | | |
| Geometric | Mean (µm) | 193.94 | Wentworth: |
| Logarithmic | Mean (Phi) | 2.37 | Fine sand |
| | Sorting | 0.52 | Moderately well |
| | Skewness | 0.05 | Symmetrical |
| | Kurtosis | 1.09 | Mesokurtic |
| Other Statistics | Phi (ϕ) | µm | Wentworth: |
| Median (D50) | 2.36 | 195.47 | Fine sand |
| 1st Local Maxima (Mode) | 2.50 | 176.78 | Fine sand |
| 2nd Local Maxima | - | - | - |
| 3rd Local Maxima | - | - | - |

| Classification | | Composition | |
|---|---|---|---|
| Modified Folk | Sand | Fines | 1.70% |
| EUNIS Folk | Sand and muddy sand | Sand | 98.30% |
| Distribution | Unimodal | Gravel | 0.00% |



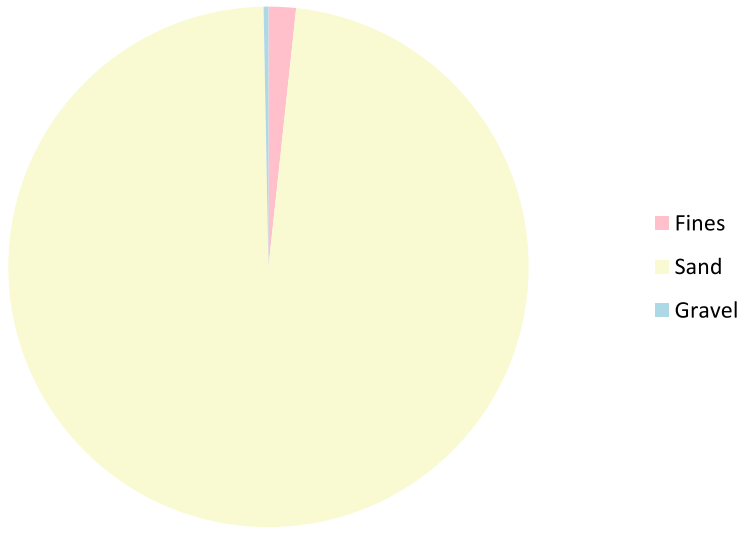
# APPENDIX G PARTICLE SIZE ANALYSIS

| ENV58 | | | | |
|---|---|---|---|---|
| Aperature (µm) | Aperature (Phi) | Percentage Fraction | Cumulative Percentage | Sediment Description |
| 5656.85 | -2.50 | 0.11 | 0.11 | Pebble |
| 4000.00 | -2.00 | 0.04 | 0.15 | |
| 2828.43 | -1.50 | 0.04 | 0.19 | Granule |
| 2000.00 | -1.00 | 0.08 | 0.26 | |
| 1414.21 | -0.50 | 0.06 | 0.33 | Very coarse sand |
| 1000.00 | 0.00 | 0.12 | 0.44 | |
| 707.11 | 0.50 | 0.76 | 1.20 | Coarse sand |
| 500.00 | 1.00 | 2.08 | 3.28 | |
| 353.55 | 1.50 | 7.96 | 11.25 | Medium sand |
| 250.00 | 2.00 | 28.05 | 39.30 | |
| 176.78 | 2.50 | 38.48 | 77.77 | Fine sand |
| 125.00 | 3.00 | 17.25 | 95.02 | |
| 88.39 | 3.50 | 2.53 | 97.55 | Very fine sand |
| 62.50 | 4.00 | 0.72 | 98.27 | |
| 44.19 | 4.50 | 0.21 | 98.48 | Coarse silt |
| 31.25 | 5.00 | 0.13 | 98.61 | |
| 22.10 | 5.50 | 0.13 | 98.74 | Medium silt |
| 15.63 | 6.00 | 0.09 | 98.84 | |
| 11.05 | 6.50 | 0.09 | 98.93 | Fine silt |
| 7.81 | 7.00 | 0.08 | 99.01 | |
| 5.52 | 7.50 | 0.06 | 99.07 | Very fine silt |
| 3.91 | 8.00 | 0.05 | 99.12 | |
| 2.76 | 8.50 | 0.04 | 99.16 | Clay |
| 1.95 | 9.00 | 0.06 | 99.21 | |
| 1.38 | 9.50 | 0.09 | 99.30 | |
| 0.98 | 10.00 | 0.11 | 99.40 | |
| 0.69 | 10.50 | 0.11 | 99.52 | |
| 0.49 | 11.00 | 0.11 | 99.63 | |
| 0.35 | 11.50 | 0.10 | 99.73 | |
| 0.24 | 12.00 | 0.09 | 99.82 | |
| 0.17 | 12.50 | 0.07 | 99.88 | |
| 0.12 | 13.00 | 0.06 | 99.94 | |
| <0.12 | >13 | 0.06 | 100.00 | |



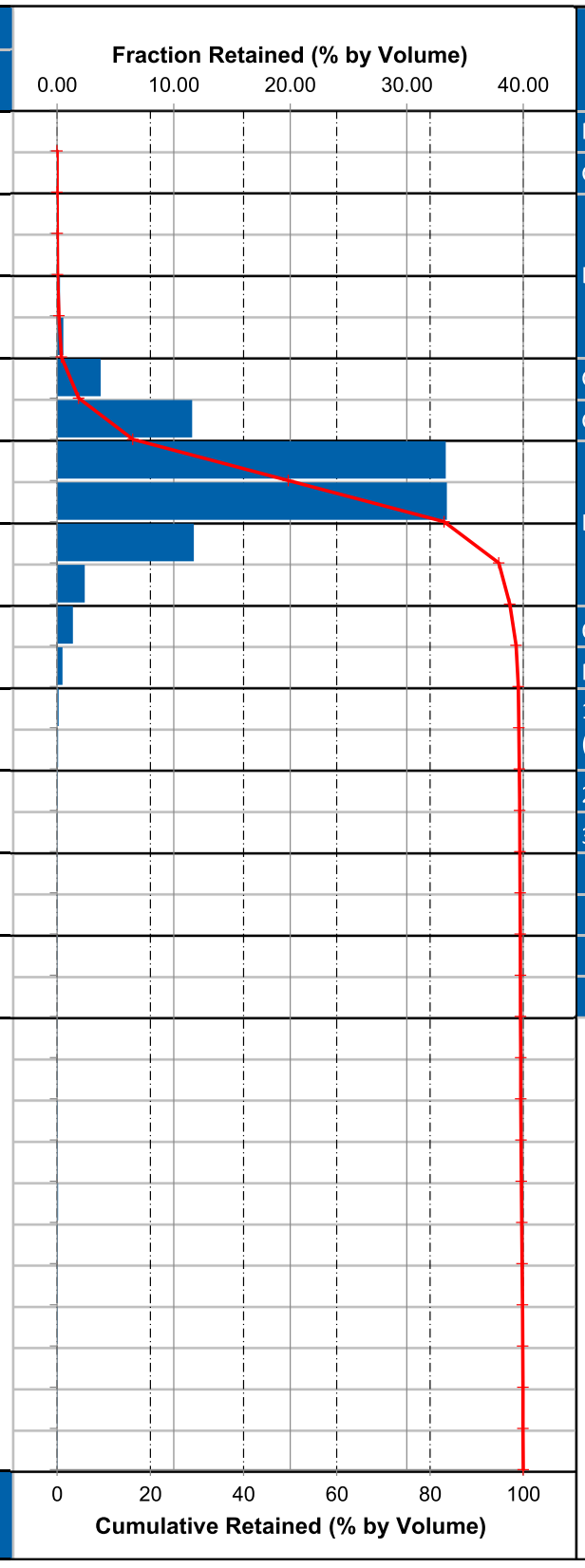

| | | | |
|---|---|---|---|
| Method of Moments | | | |
| Geometric | Mean (µm) | 218.79 | Wentworth: |
| Logarithmic | Mean (Phi) | 2.19 | Fine sand |
| | Sorting | 1.06 | Poor |
| | Skewness | 5.02 | Very fine |
| | Kurtosis | 45.70 | Very leptokurtic |
| Graphic Folk and Ward | | | |
| Geometric | Mean (µm) | 227.71 | Wentworth: |
| Logarithmic | Mean (Phi) | 2.13 | Fine sand |
| | Sorting | 0.56 | Moderately well |
| | Skewness | -0.05 | Symmetrical |
| | Kurtosis | 1.08 | Mesokurtic |
| Other Statistics | Phi (ϕ) | µm | Wentworth: |
| Median (D50) | 2.14 | 227.03 | Fine sand |
| 1st Local Maxima (Mode) | 2.50 | 176.78 | Fine sand |
| 2nd Local Maxima | - | - | - |
| 3rd Local Maxima | - | - | - |

| Classification | | Composition | |
|---|---|---|---|
| Modified Folk | Sand | Fines | 1.70% |
| EUNIS Folk | Sand and muddy sand | Sand | 98.00% |
| Distribution | Unimodal | Gravel | 0.30% |



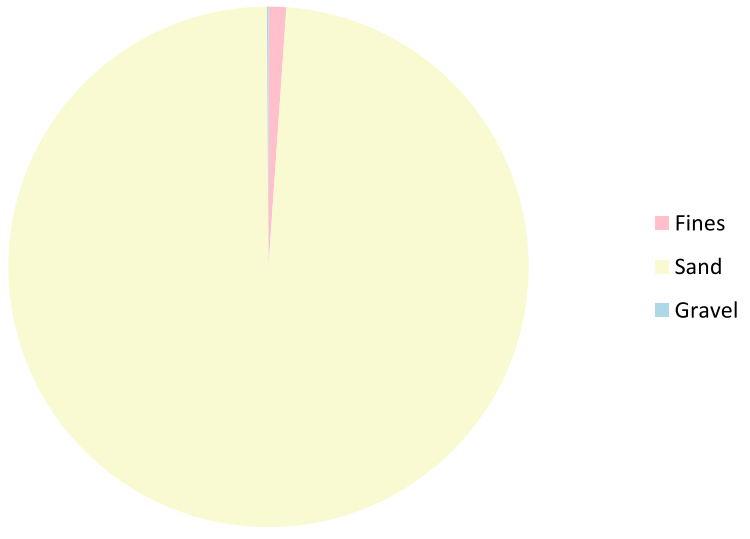
# APPENDIX G PARTICLE SIZE ANALYSIS

| ENV59 | | | | |
|---|---|---|---|---|
| Aperature (µm) | Aperature (Phi) | Percentage Fraction | Cumulative Percentage | Sediment Description |
| 5656.85 | -2.50 | 0.00 | 0.00 | Pebble |
| 4000.00 | -2.00 | 0.00 | 0.00 | |
| 2828.43 | -1.50 | 0.02 | 0.02 | Granule |
| 2000.00 | -1.00 | 0.09 | 0.11 | |
| 1414.21 | -0.50 | 0.26 | 0.37 | Very coarse sand |
| 1000.00 | 0.00 | 0.54 | 0.90 | |
| 707.11 | 0.50 | 3.73 | 4.64 | Coarse sand |
| 500.00 | 1.00 | 11.59 | 16.23 | |
| 353.55 | 1.50 | 33.35 | 49.58 | Medium sand |
| 250.00 | 2.00 | 33.45 | 83.02 | |
| 176.78 | 2.50 | 11.73 | 94.75 | Fine sand |
| 125.00 | 3.00 | 2.37 | 97.12 | |
| 88.39 | 3.50 | 1.36 | 98.48 | Very fine sand |
| 62.50 | 4.00 | 0.46 | 98.94 | |
| 44.19 | 4.50 | 0.14 | 99.08 | Coarse silt |
| 31.25 | 5.00 | 0.09 | 99.17 | |
| 22.10 | 5.50 | 0.06 | 99.23 | Medium silt |
| 15.63 | 6.00 | 0.05 | 99.28 | |
| 11.05 | 6.50 | 0.05 | 99.33 | Fine silt |
| 7.81 | 7.00 | 0.04 | 99.37 | |
| 5.52 | 7.50 | 0.03 | 99.40 | Very fine silt |
| 3.91 | 8.00 | 0.02 | 99.42 | |
| 2.76 | 8.50 | 0.02 | 99.44 | Clay |
| 1.95 | 9.00 | 0.03 | 99.48 | |
| 1.38 | 9.50 | 0.05 | 99.53 | |
| 0.98 | 10.00 | 0.07 | 99.60 | |
| 0.69 | 10.50 | 0.08 | 99.68 | |
| 0.49 | 11.00 | 0.07 | 99.75 | |
| 0.35 | 11.50 | 0.07 | 99.82 | |
| 0.24 | 12.00 | 0.06 | 99.88 | |
| 0.17 | 12.50 | 0.05 | 99.92 | |
| 0.12 | 13.00 | 0.04 | 99.96 | |
| <0.12 | >13 | 0.04 | 100.00 | |




| | | | |
|---|---|---|---|
| Method of Moments | | | |
| Geometric | Mean (µm) | 336.23 | Wentworth: |
| Logarithmic | Mean (Phi) | 1.57 | Medium sand |
| | Sorting | 0.98 | Moderately |
| | Skewness | 5.46 | Very fine |
| | Kurtosis | 54.32 | Very leptokurtic |
| Graphic Folk and Ward | | | |
| Geometric | Mean (µm) | 350.45 | Wentworth: |
| Logarithmic | Mean (Phi) | 1.51 | Medium sand |
| | Sorting | 0.57 | Moderately well |
| | Skewness | 0.02 | Symmetrical |
| | Kurtosis | 1.11 | Leptokurtic |
| Other Statistics | Phi (ϕ) | µm | Wentworth: |
| Median (D50) | 1.51 | 352.01 | Medium sand |
| 1st Local Maxima (Mode) | 2.00 | 250.00 | Medium sand |
| 2nd Local Maxima | - | - | - |
| 3rd Local Maxima | - | - | - |

| Classification | | Composition | |
|---|---|---|---|
| Modified Folk | Sand | Fines | 1.10% |
| EUNIS Folk | Sand and muddy sand | Sand | 98.80% |
| Distribution | Unimodal | Gravel | 0.10% |



# APPENDIX H SPEARMAN'S RANK CORRELATION

# APPENDIX H SPEARMAN'S RANK CORRELATION

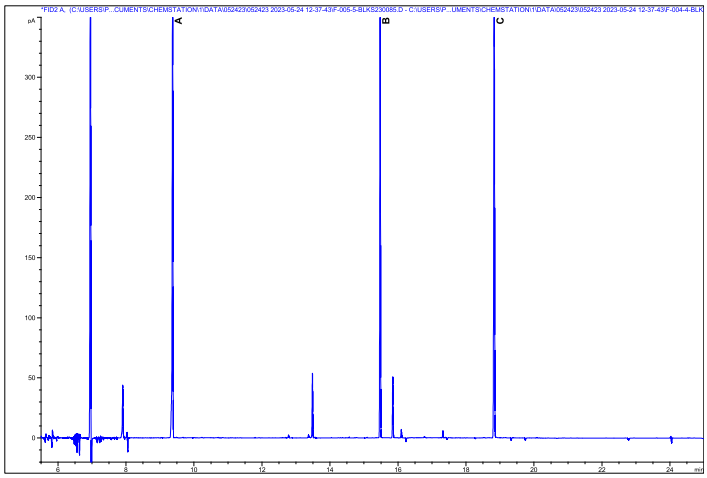
| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dixon's test for high outliers (n=8 to 10) | 0.34 | 0.19 | 0.09 | 0.08 | 0.25 | 0.38 | 0.38 | 0.19 | 0.22 | 0.25 | 0.45 | 0.39 | 0.12 | 0.38 | 0.13 | 0.22 | 0.37 |
| Dixon's test for low outliers (n=8 to 10) | 0.17 | 0.01 | 0.02 | 0.10 | 0.02 | 0.29 | 0.25 | 0.07 | 0.01 | 0.00 | 0.01 | 0.00 | 0.17 | 0.00 | 0.07 | 0.12 | 0.04 |
| Station | Depth at CHEM (m Obs) | Mean µm | Fines | Sand | TOC | THC | UCM | nC10-20 | nC21-37 | Total n-alkanes | Pristane | Arsenic (As) | Chromium (Cr) | Copper (Cu) | Nickel (Ni) | Lead (Pb) | Zinc (Zn) |
| ENV04 | 83 | 61 | 31.3 | 68.7 | 0.37 | 11.3 | 8.1 | 0.035 | 0.283 | 0.318 | 0.011 | 3.3 | 11.6 | 4.3 | 7.0 | 4.7 | 18.1 |
| ENV13 | 63 | 220 | 9.5 | 90.3 | 0.19 | 6.0 | 3.7 | 0.012 | 0.069 | 0.081 | 0.003 | 2.2 | 7.4 | 3.0 | 3.3 | 2.5 | 10.6 |
| ENV17 | 75 | 130 | 18.9 | 80.8 | 0.3 | 12.9 | 8.2 | 0.033 | 0.331 | 0.364 | 0.010 | 2.6 | 10.2 | 3.5 | 5.3 | 3.9 | 16.3 |
| ENV26 | 110 | 47 | 40.7 | 59.3 | 0.77 | 18.7 | 13.1 | 0.057 | 0.421 | 0.478 | 0.022 | 4.1 | 14.7 | 5.9 | 9.8 | 6.2 | 24.8 |
| ENV29 | 83 | 48 | 37.2 | 62.8 | 0.61 | 14.0 | 9.5 | 0.047 | 0.314 | 0.361 | 0.012 | 3.3 | 13.8 | 4.8 | 9.0 | 5.4 | 19.7 |
| ENV31 | 76 | 99 | 23.2 | 76.8 | 0.35 | 9.2 | 6.4 | 0.027 | 0.175 | 0.202 | 0.007 | 2.1 | 9.1 | 3.9 | 5.6 | 3.4 | 14.9 |
| ENV36 | 73 | 107 | 16.0 | 84.0 | 0.62 | 11.4 | 7.4 | 0.040 | 0.211 | 0.251 | 0.010 | 2.1 | 10.6 | 3.9 | 6.9 | 3.9 | 14.6 |
| ENV53 | 31 | 270 | 2.5 | 95.1 | 0.17 | 10.1 | 9.5 | 0.003 | 0.016 | 0.018 | 0.001 | 5.4 | 6.1 | 3.0 | 3.7 | 2.6 | 11.9 |
| ENV58_A | 20 | 228 | 1.7 | 98.0 | 0.16 | 2.8 | 1.8 | 0.006 | 0.014 | 0.020 | 0.001 | 3.7 | 7.4 | 3.2 | 4.5 | 2.1 | 11.00 |
| Depth at CHEM (m Obs) | | -0.96 | 1.00 | -1.00 | 0.83 | 0.76 | 0.64 | 0.85 | 0.86 | 0.85 | 0.95 | -0.03 | 0.90 | 0.91 | 0.88 | 0.92 | 0.93 |
| Mean µm | | | -0.97 | 0.97 | -0.88 | -0.72 | -0.53 | -0.92 | -0.80 | -0.82 | -0.92 | 0.10 | -0.95 | -0.97 | -0.93 | -0.90 | -0.88 |
| Fines | | | | -1.00 | 0.83 | 0.78 | 0.67 | 0.87 | 0.87 | 0.85 | 0.95 | -0.03 | 0.90 | 0.92 | 0.88 | 0.93 | 0.93 |
| Sand | | | | | -0.83 | -0.78 | -0.67 | -0.87 | -0.87 | -0.85 | -0.95 | 0.03 | -0.90 | -0.92 | -0.88 | -0.93 | -0.93 |
| TOC | | | | | | 0.80 | 0.57 | 0.95 | 0.78 | 0.77 | 0.87 | -0.20 | 0.90 | 0.87 | 0.88 | 0.89 | 0.77 |
| THC | | | | | | | 0.88 | 0.85 | 0.92 | 0.87 | 0.90 | 0.15 | 0.83 | 0.75 | 0.78 | 0.93 | 0.87 |
| UCM | | | | | | | | 0.58 | 0.72 | 0.62 | 0.73 | 0.49 | 0.59 | 0.57 | 0.62 | 0.80 | 0.78 |
| nC10-20 | | | | | | | | | 0.87 | 0.88 | 0.93 | -0.13 | 0.98 | 0.92 | 0.92 | 0.92 | 0.83 |
| nC21-37 | | | | | | | | | | 0.98 | 0.95 | -0.03 | 0.87 | 0.77 | 0.77 | 0.91 | 0.88 |
| Total n-alkanes | | | | | | | | | | | 0.93 | -0.07 | 0.90 | 0.80 | 0.78 | 0.88 | 0.87 |
| Pristane | | | | | | | | | | | | 0.02 | 0.95 | 0.89 | 0.88 | 0.98 | 0.93 |
| Arsenic (As) | | | | | | | | | | | | | -0.03 | 0.02 | 0.07 | 0.10 | 0.18 |
| Chromium (Cr) | | | | | | | | | | | | | | 0.96 | 0.95 | 0.94 | 0.90 |
| Copper (Cu) | | | | | | | | | | | | | | | 0.99 | 0.91 | 0.92 |
| Nickel (Ni) | | | | | | | | | | | | | | | | 0.92 | 0.92 |
| Lead (Pb) | | | | | | | | | | | | | | | | | 0.95 |
| Zinc (Zn) | | | | | | | | | | | | | | | | | |

**Critical Values Outliers Test**
p < 0.01 if value >= 0.635
p < 0.05 if value >= 0.512

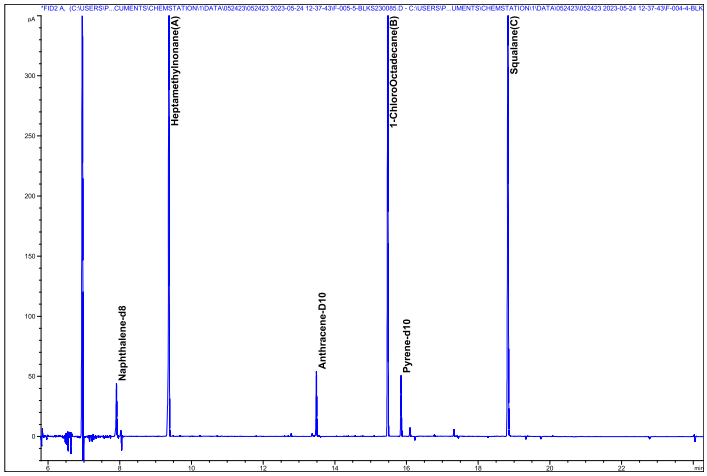
**Critical Values Spearmans Test**
p < 0.01 if value >= 0.833
p < 0.05 if value >= 0.683

# APPENDIX I HYDROCARBON ANALYSIS

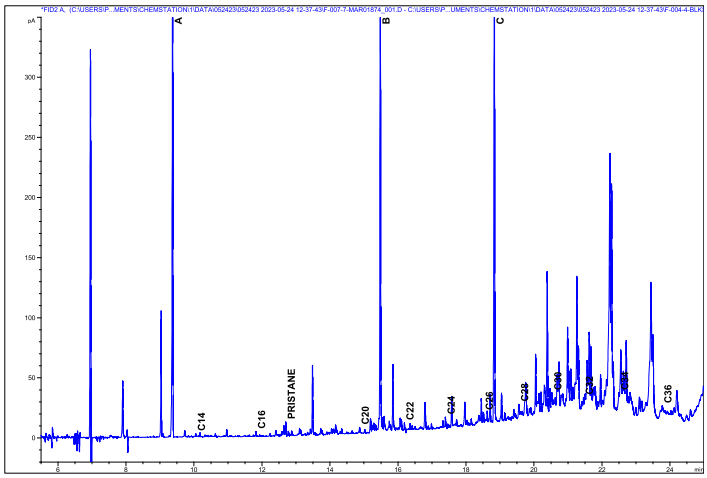
# APPENDIX I HYDROCARBON ANALYSIS




**BLKS230085**




**BLKS230085Labelled**




**ENV04**

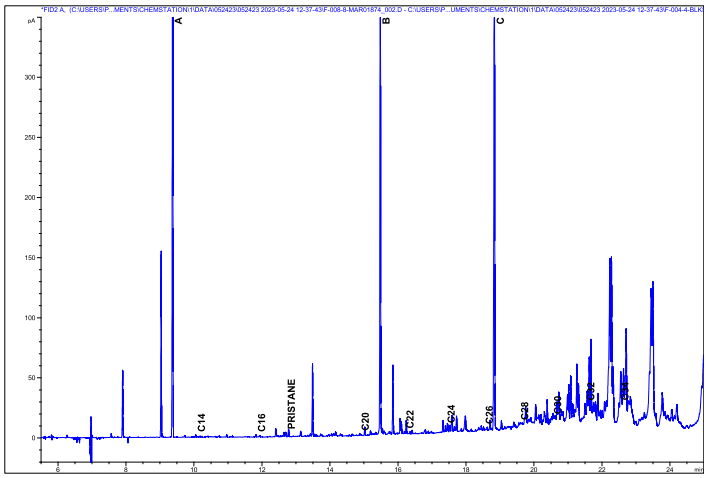
**THC:** 11.326µg $g^{-1}$

**UCM:** 8.076µg $g^{-1}$

**n-Alkanes:** 0.318µg $g^{-1}$

**Note:**
Peaks at ~7.01, ~16.09 and ~17.32 minutes are believed to be lab introduced and therefore excluded from the reported concentrations.
Negative peaks may appear where blank subtraction has been used.

# APPENDIX I HYDROCARBON ANALYSIS

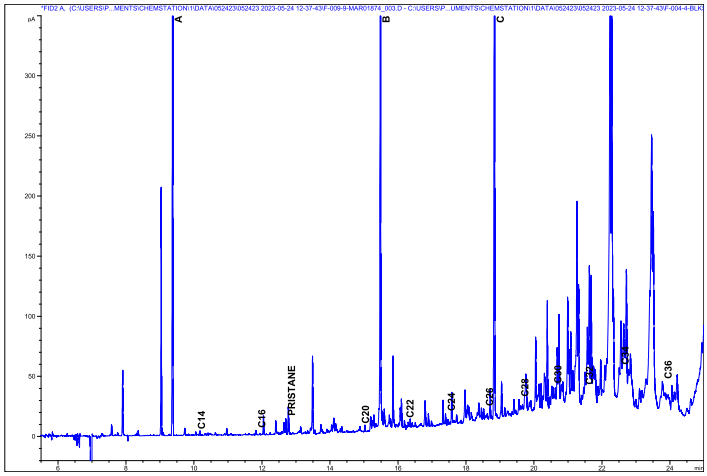



**ENV13**

**THC:** 6.023µg $g^{-1}$

**UCM:** 3.724µg $g^{-1}$

**n-Alkanes:** 0.081µg $g^{-1}$

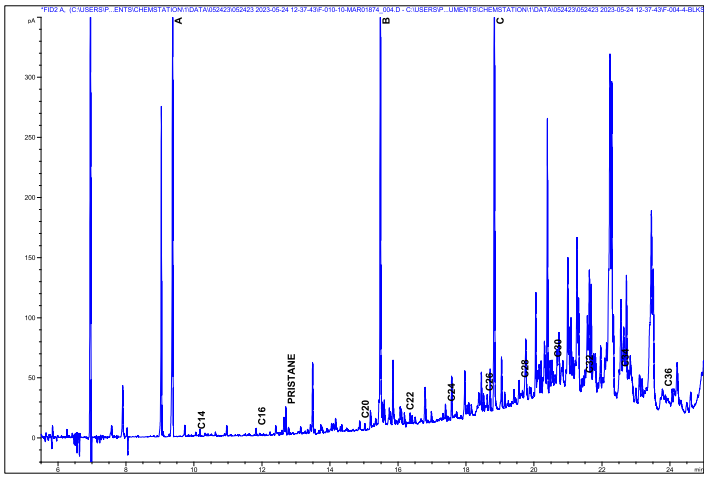



**ENV17**

**THC:** 12.862µg $g^{-1}$

**UCM:** 8.203µg $g^{-1}$

**n-Alkanes:** 0.364µg $g^{-1}$




**ENV26**

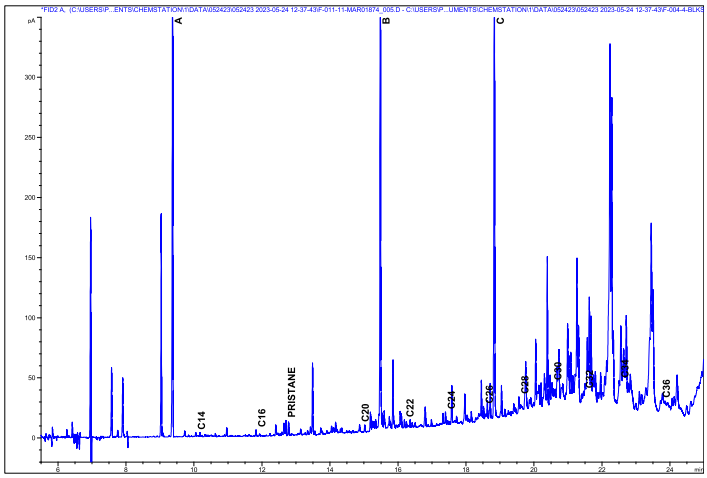
**THC:** 18.739µg $g^{-1}$

**UCM:** 13.082µg $g^{-1}$

**n-Alkanes:** 0.478µg $g^{-1}$

**Note:**
Peaks at ~7.01, ~16.09 and ~17.32 minutes are believed to be lab introduced and therefore excluded from the reported concentrations.
Negative peaks may appear where blank subtraction has been used.

# APPENDIX I HYDROCARBON ANALYSIS

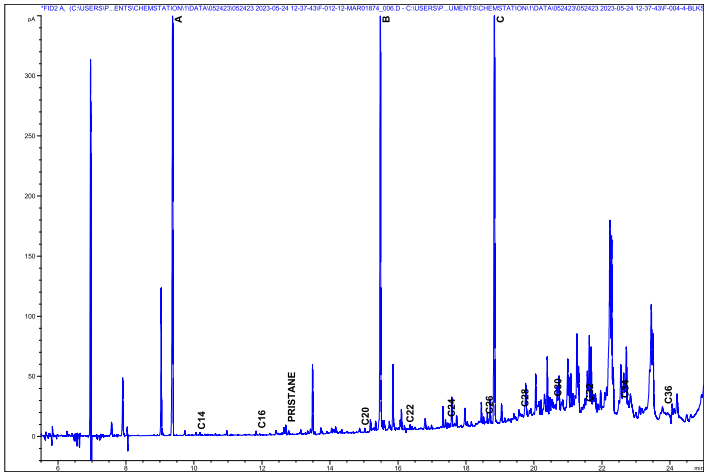



**ENV29**

**THC:** 13.956µg $g^{-1}$

**UCM:** 9.542µg $g^{-1}$

**n-Alkanes:** 0.361µg $g^{-1}$

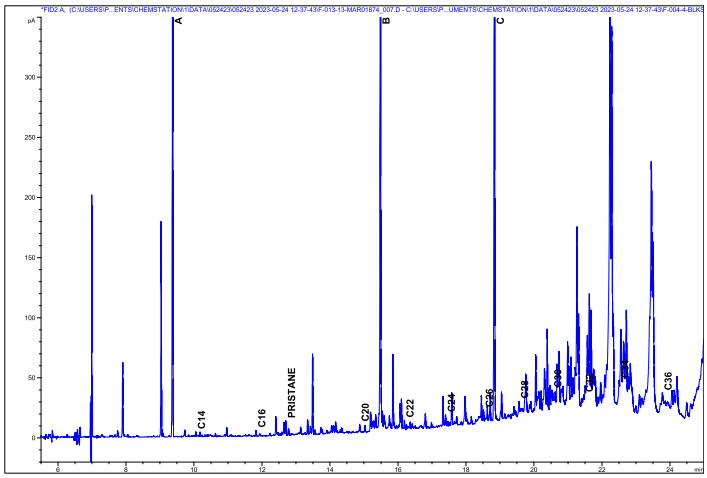



**ENV31**

**THC:** 9.216µg $g^{-1}$

**UCM:** 6.438µg $g^{-1}$

**n-Alkanes:** 0.202µg $g^{-1}$




**ENV36**

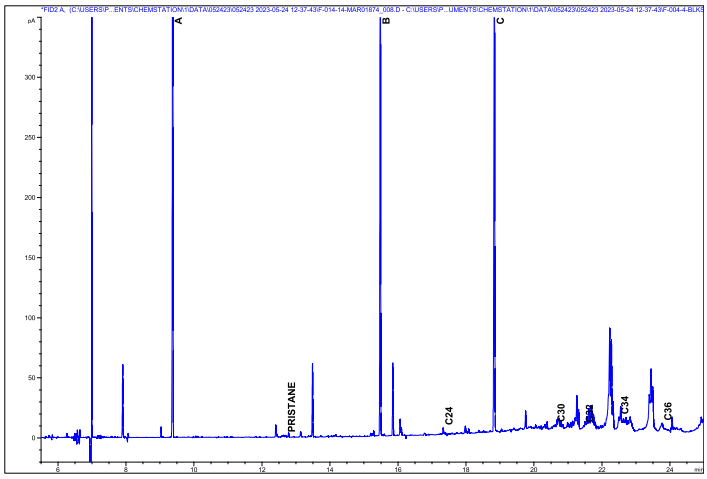
**THC:** 11.444µg $g^{-1}$

**UCM:** 7.439µg $g^{-1}$

**n-Alkanes:** 0.251µg $g^{-1}$

**Note:**
Peaks at ~7.01, ~16.09 and ~17.32 minutes are believed to be lab introduced and therefore excluded from the reported concentrations.
Negative peaks may appear where blank subtraction has been used.

# APPENDIX I HYDROCARBON ANALYSIS

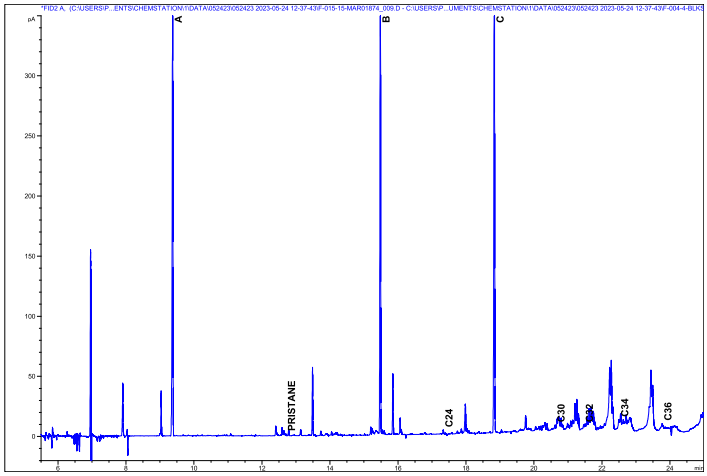



**ENV53**

**THC:** 10.145µg $g^{-1}$

**UCM:** 9.536µg $g^{-1}$

**n-Alkanes:** 0.018µg $g^{-1}$

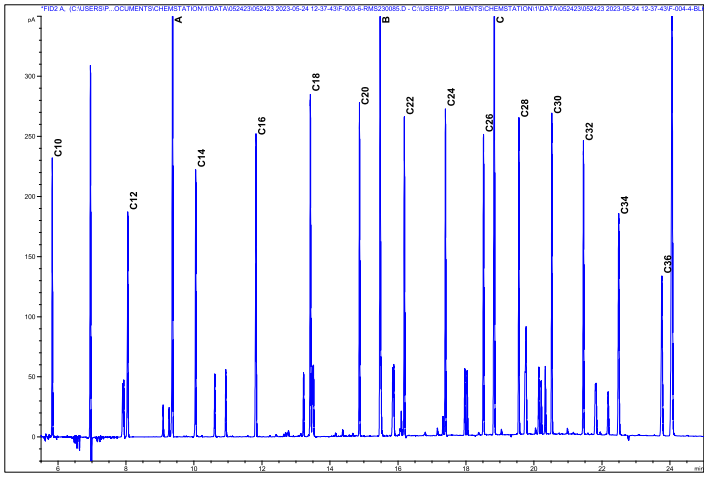



**ENV58_A**

**THC:** 2.770µg $g^{-1}$

**UCM:** 1.783µg $g^{-1}$

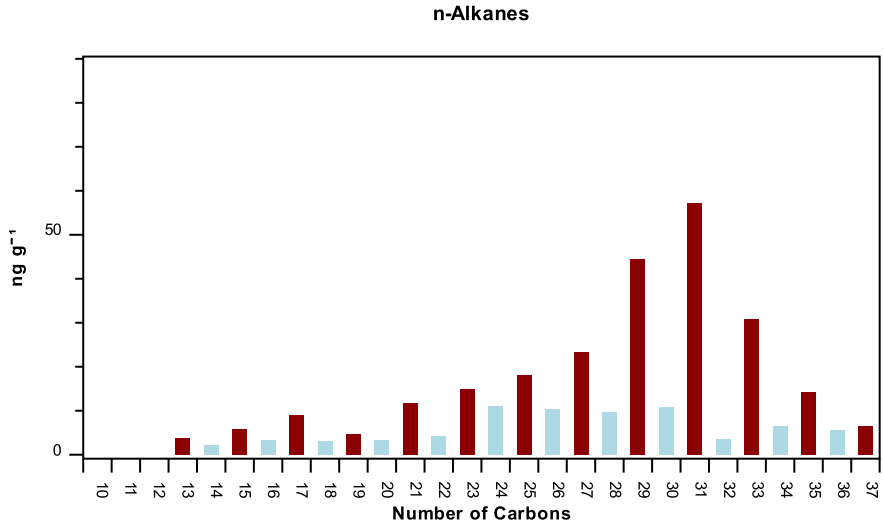
**n-Alkanes:** 0.020µg $g^{-1}$




**RMS230085**

**Note:**
Peaks at ~7.01, ~16.09 and ~17.32 minutes are believed to be lab introduced and therefore excluded from the reported concentrations.
Negative peaks may appear where blank subtraction has been used.

# APPENDIX I HYDROCARBON ANALYSIS




**ENV04**

**$nC_{10}$-$nC_{20}$:** 35ng $g^{-1}$

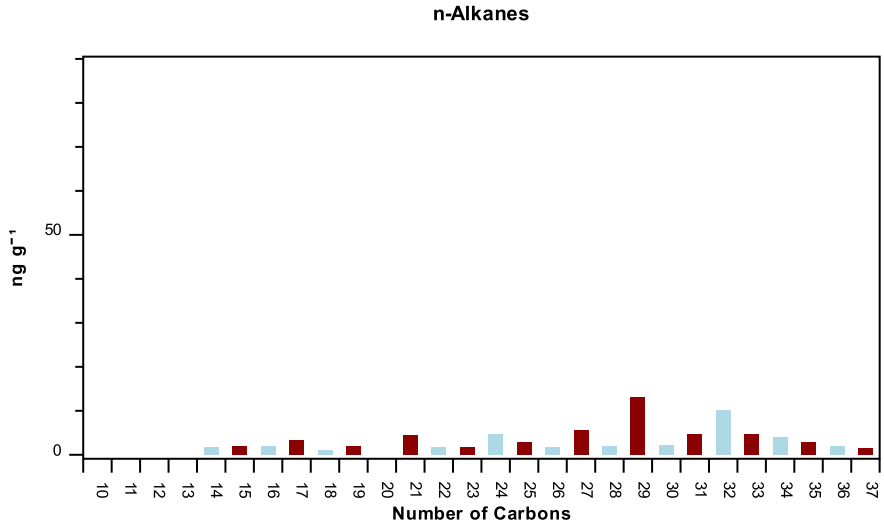
**$nC_{21}$-$nC_{37}$:** 283ng $g^{-1}$

**$nC_{10}$-$nC_{37}$:** 318ng $g^{-1}$

**Odd Length n-Alkanes:** 245ng $g^{-1}$

**Even Length n-Alkanes:** 73ng $g^{-1}$

**CPI:** 3.4




**ENV13**

**$nC_{10}$-$nC_{20}$:** 12ng $g^{-1}$

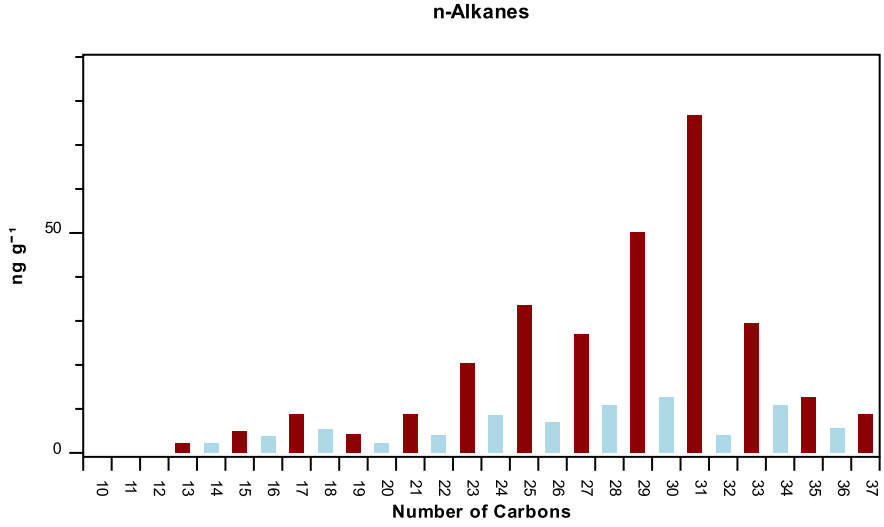
**$nC_{21}$-$nC_{37}$:** 69ng $g^{-1}$

**$nC_{10}$-$nC_{37}$:** 81ng $g^{-1}$

**Odd Length n-Alkanes:** 48ng $g^{-1}$

**Even Length n-Alkanes:** 33ng $g^{-1}$

**CPI:** 4.9




**ENV17**

**$nC_{10}$-$nC_{20}$:** 33ng $g^{-1}$

**$nC_{21}$-$nC_{37}$:** 331ng $g^{-1}$

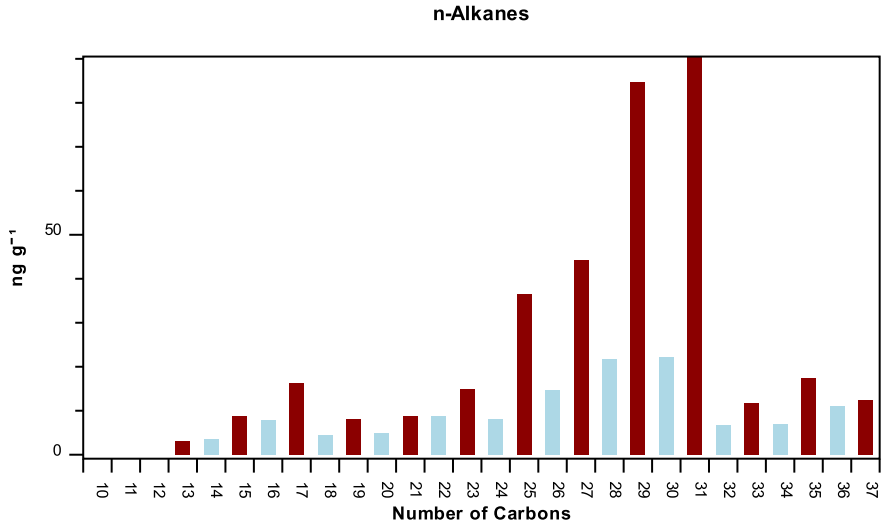
**$nC_{10}$-$nC_{37}$:** 364ng $g^{-1}$

**Odd Length n-Alkanes:** 287ng $g^{-1}$

**Even Length n-Alkanes:** 77ng $g^{-1}$

**CPI:** 3.7

# APPENDIX I HYDROCARBON ANALYSIS




**ENV26**

**$nC_{10}$-$nC_{20}$:** 57ng $g^{-1}$

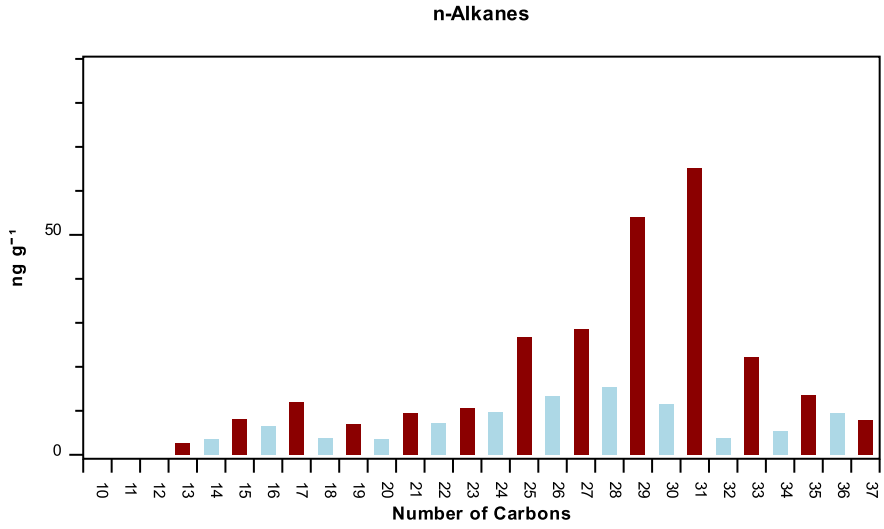
**$nC_{21}$-$nC_{37}$:** 421ng $g^{-1}$

**$nC_{10}$-$nC_{37}$:** 478ng $g^{-1}$

**Odd Length n-Alkanes:** 357ng $g^{-1}$

**Even Length n-Alkanes:** 121ng $g^{-1}$

**CPI:** 3.2




**ENV29**

**$nC_{10}$-$nC_{20}$:** 47ng $g^{-1}$

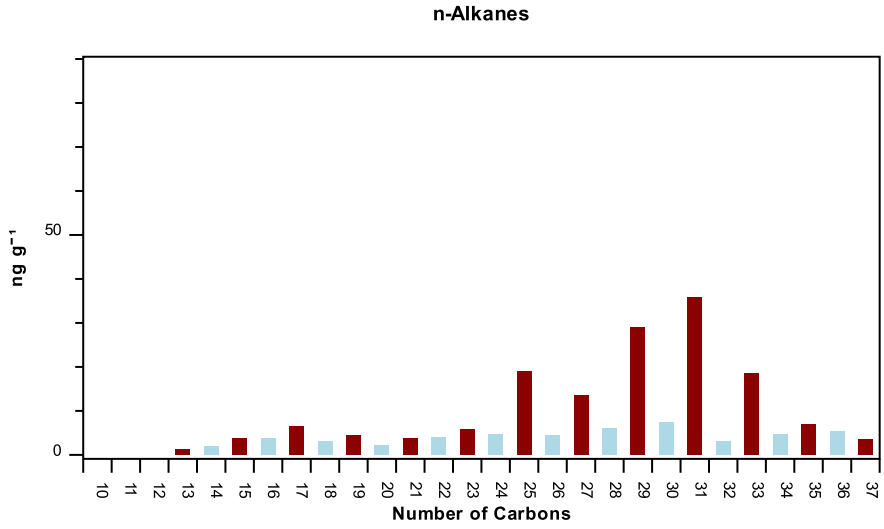
**$nC_{21}$-$nC_{37}$:** 314ng $g^{-1}$

**$nC_{10}$-$nC_{37}$:** 361ng $g^{-1}$

**Odd Length n-Alkanes:** 267ng $g^{-1}$

**Even Length n-Alkanes:** 93ng $g^{-1}$

**CPI:** 3.0




**ENV31**

**$nC_{10}$-$nC_{20}$:** 27ng $g^{-1}$

**$nC_{21}$-$nC_{37}$:** 175ng $g^{-1}$

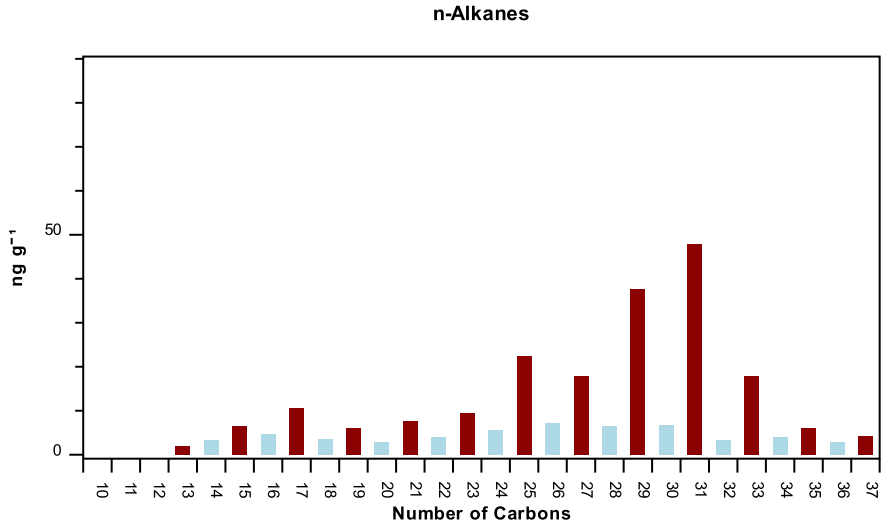
**$nC_{10}$-$nC_{37}$:** 202ng $g^{-1}$

**Odd Length n-Alkanes:** 151ng $g^{-1}$

**Even Length n-Alkanes:** 50ng $g^{-1}$

**CPI:** 3.6

# APPENDIX I HYDROCARBON ANALYSIS




**ENV36**

**$nC_{10}$-$nC_{20}$:** 40ng $g^{-1}$

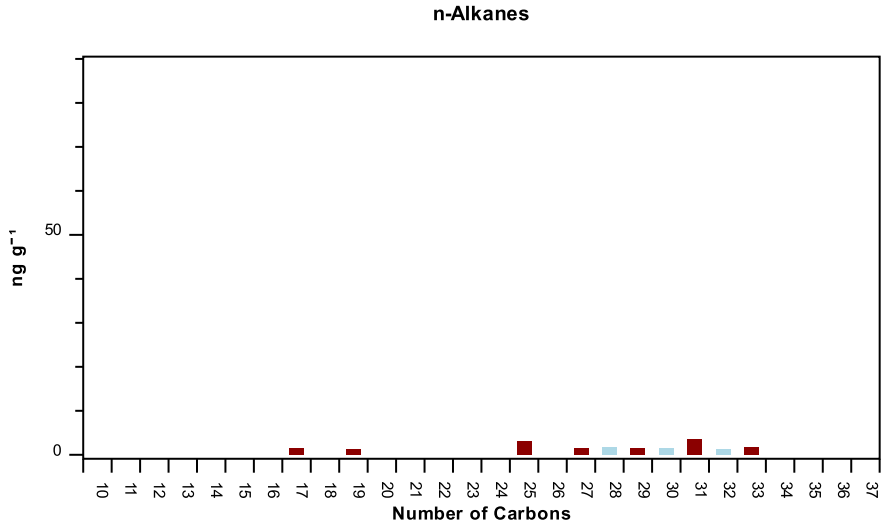
**$nC_{21}$-$nC_{37}$:** 211ng $g^{-1}$

**$nC_{10}$-$nC_{37}$:** 251ng $g^{-1}$

**Odd Length n-Alkanes:** 196ng $g^{-1}$

**Even Length n-Alkanes:** 54ng $g^{-1}$

**CPI:** 4.2




**ENV53**

**$nC_{10}$-$nC_{20}$:** 3ng $g^{-1}$

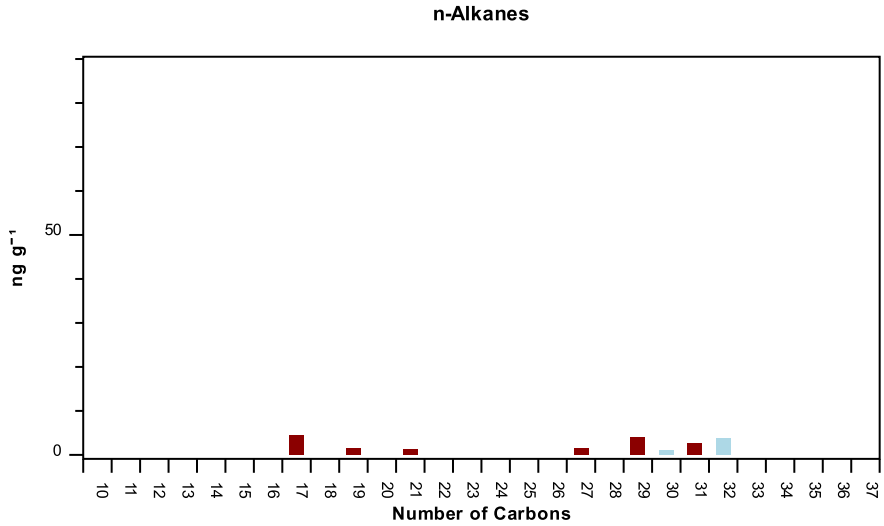
**$nC_{21}$-$nC_{37}$:** 16ng $g^{-1}$

**$nC_{10}$-$nC_{37}$:** 18ng $g^{-1}$

**Odd Length n-Alkanes:** 14ng $g^{-1}$

**Even Length n-Alkanes:** 4ng $g^{-1}$

**CPI:** 1.2




**ENV58_A**

**$nC_{10}$-$nC_{20}$:** 6ng $g^{-1}$

**$nC_{21}$-$nC_{37}$:** 14ng $g^{-1}$

**$nC_{10}$-$nC_{37}$:** 20ng $g^{-1}$

**Odd Length n-Alkanes:** 15ng $g^{-1}$

**Even Length n-Alkanes:** 5ng $g^{-1}$

**CPI:** 10.8

# APPENDIX I HYDROCARBON ANALYSIS

Table I.1 Normalised PAH Concentrations to 2.5% TOC

| Station | ENV04 | ENV13 | ENV17 | ENV26 | ENV29 | ENV31 | ENV36 | ENV53 | ENV58 | Survey Mean[1] | OSPAR (2009a) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | BC | BAC | EAC |
| Naphthalene | <LOD | <LOD | <LOD | 6 | <LOD | <LOD | <LOD | <LOD | <LOD | 6 | 5 | 8 | 43 |
| Acenaphthylene | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | NC | NA | NA | NA |
| Acenaphthene | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | NC | NA | NA | NA |
| Fluorene | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | NC | NA | NA | NA |
| Phenanthrene | 16 | <LOD | 18 | 15 | 14 | 15 | 10 | <LOD | <LOD | 15 | 17 | 32 | 1250 |
| Anthracene | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | NC | 3 | 5 | 78 |
| Fluoranthene | 26 | <LOD | 36 | 29 | 26 | 36 | 14 | <LOD | <LOD | 28 | 20 | 39 | 250 |
| Pyrene | 21 | <LOD | 28 | 23 | 20 | 28 | 10 | <LOD | <LOD | 22 | 13 | 24 | 350 |
| Benzo[a]anthracene | 12 | <LOD | 18 | 15 | 14 | 17 | 6 | <LOD | <LOD | 14 | 9 | 16 | NA |
| Chrysene | 19 | <LOD | 23 | 19 | 18 | 20 | 9 | <LOD | <LOD | 18 | 11 | 20 | NA |
| Benzo[b]fluoranthene | 53 | 20 | 52 | 53 | 51 | 47 | 31 | <LOD | <LOD | 44 | NA | NA | NA |
| Benzo[k]fluoranthene | 43 | 23 | 39 | 41 | 39 | 36 | 21 | <LOD | <LOD | 35 | NA | NA | NA |
| Benzo[e]pyrene | 55 | 27 | 51 | 54 | 54 | 50 | 35 | <LOD | <LOD | 47 | NA | NA | NA |
| Benzo[a]pyrene | 21 | <LOD | 25 | 23 | 22 | 23 | 11 | <LOD | <LOD | 21 | 15 | 30 | 625 |
| Perylene | 19 | <LOD | 31 | 23 | 9 | <LOD | <LOD | <LOD | <LOD | 21 | NA | NA | NA |
| Indeno[123,cd]pyrene | 57 | 30.0 | 59 | 64 | 63 | 57 | 40 | <LOD | <LOD | 53 | 50 | 103 | NA |
| Dibenzo[a,h]anthracene | <LOD | <LOD | <LOD | 8 | 9 | <LOD | <LOD | <LOD | <LOD | 8 | NA | NA | NA |
| Benzo[ghi]perylene | 31 | <LOD | 31 | 31 | 29 | 27 | 18 | <LOD | <LOD | 28 | 45 | 80 | NA |

Concentrations expressed as ng $g^{-1}$ dry weight sediment normalised to 2.5% TOC.

Blue cells are where concentrations exceed the OSPAR (2009a) BC with values below indicating pristine or remote environments.

NC Not calculated due to all concentrations being below LOD.

NA Not available

1 Survey mean relates to concentrations above LOD only.

# APPENDIX J POLYBROMINATED DIPHENYL ETHERS ANALYSIS

# APPENDIX J POLYBROMINATED DIPHENYL ETHERS ANALYSIS

Table K.1 Concentrations of PBDEs when Normalised to 2.5% TOC

| Station | ENV04 | ENV13 | ENV17 | ENV26 | ENV29 | ENV31 | ENV36 | ENV53 | ENV58 | OSPAR (2020) BAC | FEQG (Viñas et al., 2023) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PBDE 17 | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | 0.5 | NA |
| PBDE 28 | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | 0.5 | 110 |
| PBDE 47 | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | 0.5 | 97.5 |
| PBDE 66 | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | 0.5 | 97.5 |
| PBDE 85 | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | 0.5 | 1 |
| PBDE 99 | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | 0.5 | 1 |
| PBDE 100 | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | 0.5 | 1 |
| PBDE 138 | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | 0.5 | NA |
| PBDE 153 | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | 0.5 | 1100 |
| PBDE 154 | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | 0.5 | 1100 |
| PBDE 183 | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | <LOD | 0.5 | 14000 |
| PBDE 209 | 5.4 | 9.3 | 5.1 | 5.0 | 1.2 | 13.3 | 1.6 | 3.3 | <LOD | 0.5 | 47.5 |

Concentrations expressed as ng $g^{-1}$ dry weight sediment.
Grey text relate to concentrations below LOD.
Blue cells are where concentrations exceed the OSPAR (2020) BAC after normalisation to 2.5% TOC.

# APPENDIX K METALS ANALYSIS

# APPENDIX K METALS ANALYSIS

Table J.1 Normalised Metals to 1% TOC

| Station | As | Cd | Cr | Cu | Hg | Ni | Pb | Zn |
|---|---|---|---|---|---|---|---|---|
| ENV04 | 8.9 | 0.2 | 31.4 | 11.6 | <LOD | 18.9 | 12.7 | 48.9 |
| ENV13 | 11.6 | <LOD | 38.9 | 15.8 | <LOD | 17.4 | 13.2 | 55.8 |
| ENV17 | 8.7 | 0.1 | 34.0 | 11.7 | <LOD | 17.7 | 13.0 | 54.3 |
| ENV26 | 5.3 | 0.2 | 19.1 | 7.7 | <LOD | 12.7 | 8.1 | 32.2 |
| ENV29 | 5.4 | 0.2 | 22.6 | 7.9 | <LOD | 14.8 | 8.9 | 32.3 |
| ENV31 | 6.0 | 0.1 | 26.0 | 11.1 | 0.03 | 16.0 | 9.7 | 42.6 |
| ENV36 | 3.4 | 0.1 | 17.1 | 6.3 | <LOD | 11.1 | 6.3 | 23.5 |
| ENV53 | 31.8 | <LOD | 35.9 | 17.6 | <LOD | 21.8 | 15.3 | 70.0 |
| ENV58 | 23.1 | 0.4 | 46.3 | 20.0 | <LOD | 28.1 | 13.1 | 68.8 |
| OSPAR EAC | NA | 60 | NA | NA | 220 | NA | 2200 | NA |

NA Not Available

# APPENDIX L DNA ANALYSIS

# APPENDIX L DNA ANALYSIS

| NMSeqID | Phylum | Class | Order | Family | Genus | Species | Stations | | | | | | | | Total number of reads | Present at number of samples |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | ENV04 | ENV13 | ENV17 | ENV26 | ENV29 | ENV31 | ENV36 | ENV53 | | |
| IM-36XP3I | Acidobacteria | | | | | | 0 | 44 | 0 | 0 | 0 | 0 | 0 | 26 | **70** | **2** |
| IM-244DSC | Acidobacteria | | | | | | 37 | 33 | 78 | 48 | 36 | 52 | 31 | 0 | **315** | **7** |
| IM-E832RH | Acidobacteria | | | | | | 77 | 121 | 32 | 22 | 53 | 60 | 72 | 143 | **580** | **8** |
| IM-NN501I | Acidobacteria | | | | | | 0 | 0 | 31 | 0 | 0 | 0 | 0 | 0 | **31** | **1** |
| IM-RHE679 | Acidobacteria | | | | | | 0 | 0 | 33 | 35 | 30 | 0 | 0 | 0 | **98** | **3** |
| IM-6FB0H7 | Acidobacteria | | | | | | 24 | 0 | 31 | 42 | 20 | 0 | 0 | 0 | **117** | **4** |
| IM-M9JS13 | Acidobacteria | Acidobacteria | Acidobacteriales | Acidobacteriaceae | *Acidobacterium* | | 489 | 226 | 847 | 660 | 657 | 363 | 276 | 54 | **3572** | **8** |
| IM-3SC9Y7 | Acidobacteria | Acidobacteria | Acidobacteriales | Acidobacteriaceae | *Acidobacterium* | | 51 | 44 | 103 | 42 | 64 | 67 | 40 | 0 | **411** | **7** |
| IM-X970CA | Acidobacteria | Acidobacteria | Acidobacteriales | Acidobacteriaceae | *Acidobacterium* | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 27 | **27** | **1** |
| IM-QQ3C81 | Acidobacteria | Acidobacteria | Acidobacteriales | Acidobacteriaceae | *Acidobacterium* | | 0 | 0 | 63 | 30 | 35 | 0 | 0 | 0 | **128** | **3** |
| IM-YT35W6 | Acidobacteria | Acidobacteria | Acidobacteriales | Acidobacteriaceae | | | 0 | 34 | 0 | 0 | 0 | 0 | 0 | 250 | **284** | **2** |
| IM-Z661FF | Acidobacteria | Acidobacteria | Acidobacteriales | Acidobacteriaceae | | | 210 | 245 | 475 | 179 | 170 | 252 | 237 | 48 | **1816** | **8** |
| IM-CD13T2 | Acidobacteria | Acidobacteria | Acidobacteriales | Acidobacteriaceae | | | 283 | 460 | 577 | 217 | 206 | 239 | 216 | 507 | **2705** | **8** |
| IM-ZMK271 | Acidobacteria | Acidobacteria | Acidobacteriales | Acidobacteriaceae | | | 39 | 117 | 111 | 34 | 47 | 71 | 85 | 104 | **608** | **8** |
| IM-A38G3N | Acidobacteria | Acidobacteria | Acidobacteriales | Acidobacteriaceae | | | 0 | 58 | 0 | 0 | 0 | 30 | 30 | 178 | **296** | **4** |
| IM-4M7XA3 | Acidobacteria | Acidobacteria | Acidobacteriales | Acidobacteriaceae | | | 38 | 75 | 100 | 55 | 46 | 49 | 36 | 35 | **434** | **8** |
| IM-45H6SB | Acidobacteria | Acidobacteria | Acidobacteriales | Acidobacteriaceae | | | 27 | 103 | 35 | 0 | 28 | 37 | 50 | 157 | **437** | **7** |
| IM-3R2Z0T | Acidobacteria | Acidobacteria | Acidobacteriales | Acidobacteriaceae | | | 80 | 108 | 117 | 47 | 64 | 84 | 61 | 0 | **561** | **7** |
| IM-TI00S7 | Acidobacteria | Acidobacteria | Acidobacteriales | Acidobacteriaceae | | | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 85 | **110** | **2** |
| IM-9UQYQ7 | Acidobacteria | Acidobacteria | Acidobacteriales | Acidobacteriaceae | | | 29 | 0 | 0 | 38 | 27 | 22 | 0 | 0 | **116** | **4** |
| IM-2KIU16 | Acidobacteria | Acidobacteria | Acidobacteriales | Acidobacteriaceae | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | **30** | **1** |
| IM-81S58Y | Acidobacteria | Acidobacteria | Acidobacteriales | Acidobacteriaceae | | | 37 | 33 | 73 | 55 | 47 | 41 | 31 | 0 | **317** | **7** |
| IM-97IYP9 | Acidobacteria | Acidobacteria | Acidobacteriales | Acidobacteriaceae | | | 0 | 0 | 32 | 0 | 0 | 0 | 0 | 0 | **32** | **1** |
| IM-NZ95U2 | Acidobacteria | Acidobacteria | Acidobacteriales | Acidobacteriaceae | | | 0 | 31 | 0 | 0 | 0 | 0 | 0 | 45 | **76** | **2** |
| IM-39V8CG | Acidobacteria | Acidobacteria | Acidobacteriales | | | | 57 | 66 | 111 | 54 | 97 | 86 | 78 | 34 | **583** | **8** |
| IM-486AXC | Acidobacteria | Acidobacteria | Acidobacteriales | | | | 34 | 59 | 39 | 68 | 41 | 30 | 33 | 0 | **304** | **7** |
| IM-Z8Z2Y9 | Acidobacteria | Aminicenantia | Aminicenantales | | | | 29 | 0 | 42 | 92 | 35 | 0 | 0 | 0 | **198** | **4** |
| IM-5E8B5U | Acidobacteria | Aminicenantia | Aminicenantales | | | | 42 | 0 | 55 | 88 | 38 | 22 | 21 | 0 | **266** | **6** |
| IM-SRU839 | Acidobacteria | Aminicenantia | Aminicenantales | | | | 0 | 0 | 38 | 24 | 0 | 0 | 0 | 0 | **62** | **2** |
| IM-9ND27G | Acidobacteria | Aminicenantia | Aminicenantales | | | | 0 | 0 | 36 | 37 | 21 | 0 | 0 | 0 | **94** | **3** |
| IM-9D0S5X | Actinobacteriota | | | | | | 419 | 230 | 1041 | 597 | 507 | 486 | 377 | 159 | **3816** | **8** |
| IM-OI63K0 | Actinobacteriota | | | | | | 78 | 72 | 233 | 66 | 71 | 99 | 60 | 0 | **679** | **7** |
| IM-550TYU | Actinobacteriota | | | | | | 47 | 73 | 0 | 35 | 40 | 47 | 72 | 210 | **524** | **7** |
| IM-ID4M60 | Actinobacteriota | | | | | | 110 | 205 | 310 | 137 | 149 | 159 | 124 | 57 | **1251** | **8** |
| IM-L59JP0 | Actinobacteriota | | | | | | 58 | 99 | 136 | 84 | 41 | 58 | 47 | 146 | **669** | **8** |
| IM-3G5M1C | Actinobacteriota | | | | | | 29 | 0 | 68 | 0 | 29 | 29 | 0 | 0 | **155** | **4** |
| IM-3G5E6I | Actinobacteriota | | | | | | 0 | 52 | 0 | 0 | 0 | 0 | 0 | 89 | **141** | **2** |
| IM-K376MQ | Actinobacteriota | | | | | | 0 | 35 | 31 | 0 | 0 | 36 | 44 | 69 | **215** | **5** |
| IM-P2X8L9 | Actinobacteriota | | | | | | 0 | 54 | 0 | 0 | 0 | 34 | 32 | 55 | **175** | **4** |
| IM-1K4O8I | Actinobacteriota | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 76 | **76** | **1** |
| IM-S295WC | Actinobacteriota | | | | | | 25 | 33 | 0 | 0 | 32 | 31 | 32 | 46 | **199** | **6** |
| IM-02HE4R | Actinobacteriota | | | | | | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 23 | **53** | **2** |
| IM-EV142C | Actinobacteriota | | | | | | 27 | 0 | 59 | 58 | 47 | 0 | 24 | 0 | **215** | **5** |
| IM-2V92AL | Actinobacteriota | | | | | | 0 | 26 | 0 | 0 | 0 | 0 | 0 | 33 | **59** | **2** |
| IM-SV88J1 | Actinobacteriota | | | | | | 22 | 0 | 40 | 0 | 0 | 22 | 0 | 0 | **84** | **3** |
| IM-1R9D6E | Actinobacteriota | | | | | | 0 | 53 | 0 | 0 | 0 | 0 | 33 | 109 | **195** | **3** |
| IM-2DO94H | Actinobacteriota | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 22 | 0 | **22** | **1** |
| IM-YK953O | Actinobacteriota | | | | | | 0 | 0 | 38 | 0 | 0 | 0 | 0 | 0 | **38** | **1** |
| IM-87K5VE | Actinobacteriota | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 26 | **26** | **1** |
| IM-21ESN3 | Actinobacteriota | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | **24** | **1** |
| IM-O56WL8 | Actinobacteriota | Acidimicrobiia | Acidimicrobiales | Ilumatobacteraceae | *Ilumatobacter* | *nonamiensis* | 35 | 0 | 45 | 0 | 31 | 55 | 40 | 47 | **253** | **6** |
| IM-H116QP | Actinobacteriota | Acidimicrobiia | Acidimicrobiales | Microtrichaceae | | | 24 | 0 | 35 | 32 | 28 | 0 | 0 | 0 | **119** | **4** |
| IM-VV19U2 | Actinobacteriota | Acidimicrobiia | | | | | 51 | 40 | 38 | 34 | 36 | 38 | 37 | 0 | **274** | **7** |
| IM-18GW2R | Actinobacteriota | Actinomycetia | | | | | 0 | 96 | 0 | 0 | 0 | 0 | 0 | 711 | **807** | **2** |

# APPENDIX L DNA ANALYSIS

| NMSeqID | Phylum | Class | Order | Family | Genus | Species | Stations | | | | | | | | Total number of reads | Present at number of samples |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | ENV04 | ENV13 | ENV17 | ENV26 | ENV29 | ENV31 | ENV36 | ENV53 | | |
| IM-HG948U | Actinobacteriota | Actinomycetia | | | | | 100 | 129 | 188 | 75 | 116 | 81 | 85 | 85 | **859** | **8** |
| IM-RB438F | Actinobacteriota | Actinomycetia | | | | | 223 | 200 | 165 | 76 | 215 | 234 | 215 | 96 | **1424** | **8** |
| IM-9O40TY | Actinobacteriota | Actinomycetia | | | | | 26 | 80 | 74 | 0 | 30 | 38 | 69 | 106 | **423** | **7** |
| IM-57JG4R | Actinobacteriota | Actinomycetia | | | | | 70 | 114 | 132 | 52 | 63 | 109 | 82 | 33 | **655** | **8** |
| IM-0T28WW | Actinobacteriota | Actinomycetia | | | | | 160 | 166 | 254 | 120 | 137 | 164 | 165 | 59 | **1225** | **8** |
| IM-7PJ17B | Actinobacteriota | Actinomycetia | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 39 | **39** | **1** |
| IM-S1A1P0 | Actinobacteriota | Actinomycetia | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 55 | **55** | **1** |
| IM-ES432S | Actinobacteriota | Actinomycetia | | | | | 0 | 34 | 0 | 0 | 0 | 0 | 0 | 37 | **71** | **2** |
| IM-5EZ4U0 | Actinobacteriota | Actinomycetia | | | | | 45 | 48 | 59 | 22 | 50 | 51 | 40 | 0 | **315** | **7** |
| IM-91BON0 | Actinobacteriota | Actinomycetia | | | | | 0 | 0 | 0 | 0 | 35 | 0 | 0 | 0 | **35** | **1** |
| IM-848INU | Actinobacteriota | Actinomycetia | | | | | 0 | 45 | 0 | 0 | 0 | 0 | 35 | 66 | **146** | **3** |
| IM-Z8V8I8 | Actinobacteriota | Actinomycetia | | | | | 52 | 0 | 55 | 76 | 37 | 29 | 0 | 0 | **249** | **5** |
| IM-U49YP7 | Actinobacteriota | Actinomycetia | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 28 | **28** | **1** |
| IM-Z575CV | Actinobacteriota | Actinomycetia | | | | | 31 | 0 | 55 | 23 | 28 | 23 | 30 | 0 | **190** | **6** |
| IM-IL55S0 | Actinobacteriota | Actinomycetia | | | | | 0 | 0 | 0 | 26 | 0 | 0 | 0 | 0 | **26** | **1** |
| IM-6V28QF | Actinobacteriota | Actinomycetia | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 35 | **35** | **1** |
| IM-E8D6F2 | Actinobacteriota | Actinomycetia | | | | | 0 | 0 | 47 | 0 | 21 | 0 | 0 | 0 | **68** | **2** |
| IM-K4B9M8 | Bacteria (Domain) | | | | | | 42 | 103 | 66 | 0 | 37 | 47 | 60 | 56 | **411** | **7** |
| IM-3ND16P | Bacteria (Domain) | | | | | | 3318 | 6222 | 7303 | 2830 | 2562 | 3588 | 3226 | 3253 | **32302** | **8** |
| IM-33X7BG | Bacteria (Domain) | | | | | | 1156 | 935 | 1886 | 2017 | 1273 | 1140 | 943 | 142 | **9492** | **8** |
| IM-47M9AL | Bacteria (Domain) | | | | | | 159 | 576 | 266 | 149 | 94 | 166 | 113 | 701 | **2224** | **8** |
| IM-54Y4FX | Bacteria (Domain) | | | | | | 413 | 50 | 281 | 332 | 355 | 116 | 75 | 0 | **1622** | **7** |
| IM-O11Y9J | Bacteria (Domain) | | | | | | 300 | 168 | 503 | 366 | 243 | 317 | 249 | 0 | **2146** | **7** |
| IM-2XW61K | Bacteria (Domain) | | | | | | 358 | 134 | 538 | 144 | 364 | 281 | 199 | 57 | **2075** | **8** |
| IM-C2C2G6 | Bacteria (Domain) | | | | | | 67 | 0 | 255 | 27 | 40 | 57 | 43 | 31 | **520** | **7** |
| IM-HZF365 | Bacteria (Domain) | | | | | | 183 | 37 | 220 | 71 | 162 | 100 | 96 | 0 | **869** | **7** |
| IM-8O68JU | Bacteria (Domain) | | | | | | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 169 | **194** | **2** |
| IM-X660EN | Bacteria (Domain) | | | | | | 86 | 36 | 137 | 41 | 103 | 98 | 86 | 23 | **610** | **8** |
| IM-I82US4 | Bacteria (Domain) | | | | | | 105 | 110 | 144 | 159 | 112 | 68 | 45 | 0 | **743** | **7** |
| IM-LHE675 | Bacteria (Domain) | | | | | | 117 | 80 | 140 | 235 | 151 | 145 | 105 | 27 | **1000** | **8** |
| IM-B1X4N5 | Bacteria (Domain) | | | | | | 41 | 159 | 176 | 53 | 45 | 96 | 82 | 43 | **695** | **8** |
| IM-5O96IV | Bacteria (Domain) | | | | | | 37 | 127 | 137 | 0 | 58 | 82 | 77 | 51 | **569** | **7** |
| IM-M867ZA | Bacteria (Domain) | | | | | | 232 | 0 | 113 | 326 | 194 | 78 | 27 | 0 | **970** | **6** |
| IM-M73QUG | Bacteria (Domain) | | | | | | 94 | 0 | 44 | 69 | 81 | 42 | 19 | 0 | **349** | **6** |
| IM-Q27Y6O | Bacteria (Domain) | | | | | | 56 | 126 | 92 | 60 | 30 | 48 | 61 | 85 | **558** | **8** |
| IM-F8J2B2 | Bacteria (Domain) | | | | | | 146 | 0 | 103 | 126 | 158 | 82 | 68 | 0 | **683** | **6** |
| IM-86W6ML | Bacteria (Domain) | | | | | | 78 | 101 | 129 | 134 | 142 | 126 | 98 | 80 | **888** | **8** |
| IM-A0H1R3 | Bacteria (Domain) | | | | | | 67 | 0 | 63 | 80 | 82 | 76 | 54 | 0 | **422** | **6** |
| IM-4W3ZQ3 | Bacteria (Domain) | | | | | | 84 | 37 | 96 | 65 | 65 | 45 | 37 | 0 | **429** | **7** |
| IM-K5J16P | Bacteria (Domain) | | | | | | 23 | 119 | 64 | 39 | 30 | 30 | 32 | 353 | **690** | **8** |
| IM-8CB07I | Bacteria (Domain) | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 81 | **81** | **1** |
| IM-8LAT59 | Bacteria (Domain) | | | | | | 0 | 0 | 0 | 79 | 37 | 22 | 0 | 0 | **138** | **3** |
| IM-C8EI80 | Bacteria (Domain) | | | | | | 35 | 76 | 28 | 84 | 23 | 28 | 29 | 119 | **422** | **8** |
| IM-M14D5G | Bacteria (Domain) | | | | | | 47 | 82 | 0 | 0 | 22 | 58 | 60 | 96 | **365** | **6** |
| IM-UV51Y8 | Bacteria (Domain) | | | | | | 46 | 105 | 68 | 0 | 29 | 39 | 33 | 85 | **405** | **7** |
| IM-2D1F4U | Bacteria (Domain) | | | | | | 27 | 34 | 0 | 74 | 47 | 52 | 39 | 0 | **273** | **6** |
| IM-P47W8W | Bacteria (Domain) | | | | | | 88 | 51 | 116 | 255 | 174 | 116 | 81 | 0 | **881** | **7** |
| IM-2A20BT | Bacteria (Domain) | | | | | | 88 | 57 | 92 | 105 | 107 | 74 | 36 | 0 | **559** | **7** |
| IM-82LK0X | Bacteria (Domain) | | | | | | 24 | 36 | 0 | 0 | 20 | 0 | 26 | 91 | **197** | **5** |
| IM-71S6YP | Bacteria (Domain) | | | | | | 60 | 43 | 76 | 99 | 62 | 64 | 44 | 31 | **479** | **8** |
| IM-Y24B6Q | Bacteria (Domain) | | | | | | 60 | 0 | 146 | 92 | 67 | 59 | 45 | 0 | **469** | **6** |
| IM-80BK3N | Bacteria (Domain) | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 34 | **34** | **1** |
| IM-KC58B8 | Bacteria (Domain) | | | | | | 0 | 0 | 0 | 0 | 0 | 26 | 36 | 0 | **62** | **2** |
| IM-BMJ818 | Bacteria (Domain) | | | | | | 50 | 0 | 52 | 23 | 34 | 33 | 31 | 0 | **223** | **6** |

# APPENDIX L DNA ANALYSIS

| NMSeqID | Phylum | Class | Order | Family | Genus | Species | Stations | | | | | | | | Total number of reads | Present at number of samples |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | ENV04 | ENV13 | ENV17 | ENV26 | ENV29 | ENV31 | ENV36 | ENV53 | | |
| IM-381MRM | Bacteria (Domain) | | | | | | 0 | 44 | 0 | 0 | 0 | 0 | 0 | 65 | **109** | **2** |
| IM-Y179AK | Bacteria (Domain) | | | | | | 33 | 141 | 30 | 22 | 0 | 25 | 28 | 231 | **510** | **7** |
| IM-7TI5X6 | Bacteria (Domain) | | | | | | 31 | 0 | 46 | 37 | 25 | 0 | 0 | 0 | **139** | **4** |
| IM-Q5O3I1 | Bacteria (Domain) | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 89 | **89** | **1** |
| IM-6C6EV0 | Bacteria (Domain) | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 64 | **64** | **1** |
| IM-I89WI1 | Bacteria (Domain) | | | | | | 25 | 0 | 29 | 52 | 39 | 33 | 0 | 0 | **178** | **5** |
| IM-WA667O | Bacteria (Domain) | | | | | | 0 | 46 | 30 | 0 | 0 | 0 | 0 | 68 | **144** | **3** |
| IM-8NVV75 | Bacteria (Domain) | | | | | | 39 | 60 | 81 | 89 | 38 | 59 | 41 | 0 | **407** | **7** |
| IM-45GVO7 | Bacteria (Domain) | | | | | | 0 | 32 | 35 | 35 | 0 | 27 | 32 | 0 | **161** | **5** |
| IM-8RKY42 | Bacteria (Domain) | | | | | | 45 | 0 | 78 | 97 | 28 | 23 | 0 | 0 | **271** | **5** |
| IM-B1NG88 | Bacteria (Domain) | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 31 | **31** | **1** |
| IM-4V8DQ9 | Bacteria (Domain) | | | | | | 60 | 27 | 61 | 61 | 67 | 36 | 0 | 0 | **312** | **6** |
| IM-3Y54SF | Bacteria (Domain) | | | | | | 0 | 41 | 0 | 0 | 0 | 0 | 30 | 0 | **71** | **2** |
| IM-416CCB | Bacteria (Domain) | | | | | | 0 | 0 | 28 | 0 | 0 | 0 | 0 | 0 | **28** | **1** |
| IM-1D85JA | Bacteria (Domain) | | | | | | 0 | 26 | 43 | 0 | 0 | 0 | 0 | 0 | **69** | **2** |
| IM-2PR70D | Bacteria (Domain) | | | | | | 31 | 29 | 0 | 23 | 26 | 28 | 20 | 0 | **157** | **6** |
| IM-8W872K | Bacteria (Domain) | | | | | | 43 | 0 | 0 | 23 | 0 | 23 | 0 | 0 | **89** | **3** |
| IM-AF1NK9 | Bacteria (Domain) | | | | | | 0 | 0 | 0 | 32 | 0 | 0 | 0 | 0 | **32** | **1** |
| IM-73SI2C | Bacteria (Domain) | | | | | | 0 | 0 | 34 | 34 | 24 | 0 | 0 | 0 | **92** | **3** |
| IM-9P10KY | Bacteria (Domain) | | | | | | 0 | 29 | 45 | 0 | 0 | 22 | 0 | 0 | **96** | **3** |
| IM-23FB7H | Bacteria (Domain) | | | | | | 33 | 0 | 38 | 38 | 26 | 0 | 0 | 0 | **135** | **4** |
| IM-X056RN | Bacteria (Domain) | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 28 | **28** | **1** |
| IM-7FN5R9 | Bacteria (Domain) | | | | | | 0 | 0 | 36 | 42 | 0 | 0 | 0 | 0 | **78** | **2** |
| IM-DK491D | Bacteria (Domain) | | | | | | 89 | 80 | 127 | 72 | 87 | 89 | 71 | 25 | **640** | **8** |
| IM-B9L97U | Bacteria (Domain) | | | | | | 0 | 34 | 34 | 0 | 0 | 23 | 0 | 78 | **169** | **4** |
| IM-9S3JL7 | Bacteria (Domain) | | | | | | 75 | 47 | 103 | 149 | 85 | 75 | 59 | 0 | **593** | **7** |
| IM-9CVH35 | Bacteria (Domain) | | | | | | 0 | 42 | 0 | 0 | 0 | 0 | 0 | 0 | **42** | **1** |
| IM-B709VL | Bacteria (Domain) | | | | | | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | **30** | **1** |
| IM-8EE2P9 | Bacteria (Domain) | | | | | | 0 | 0 | 0 | 41 | 30 | 0 | 20 | 0 | **91** | **3** |
| IM-3KOW92 | Bacteria (Domain) | | | | | | 0 | 47 | 0 | 0 | 0 | 0 | 0 | 50 | **97** | **2** |
| IM-G1U75E | Bacteria (Domain) | | | | | | 30 | 0 | 0 | 0 | 23 | 0 | 0 | 0 | **53** | **2** |
| IM-5D6YR3 | Bacteria (Domain) | | | | | | 0 | 0 | 29 | 0 | 0 | 0 | 0 | 0 | **29** | **1** |
| IM-LH01L4 | Bacteria (Domain) | | | | | | 33 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | **53** | **2** |
| IM-U9D1NN | Bacteria (Domain) | | | | | | 24 | 0 | 0 | 0 | 0 | 26 | 24 | 0 | **74** | **3** |
| IM-07B5TA | Bacteria (Domain) | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 40 | **40** | **1** |
| IM-L40FZ3 | Bacteria (Domain) | | | | | | 0 | 0 | 37 | 91 | 36 | 27 | 28 | 0 | **219** | **5** |
| IM-Z1N2M0 | Bacteria (Domain) | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 26 | **26** | **1** |
| IM-02LH2V | Bacteria (Domain) | | | | | | 0 | 82 | 0 | 0 | 0 | 0 | 0 | 76 | **158** | **2** |
| IM-I33N2O | Bacteria (Domain) | | | | | | 0 | 0 | 0 | 0 | 23 | 0 | 0 | 0 | **23** | **1** |
| IM-66KAOB | Bacteria (Domain) | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 28 | **28** | **1** |
| IM-9B9S1P | Bacteria (Domain) | | | | | | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 | **25** | **1** |
| IM-LC25K5 | Bacteria (Domain) | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 38 | **38** | **1** |
| IM-Z26IH6 | Bacteria (Domain) | | | | | | 24 | 0 | 47 | 61 | 36 | 23 | 20 | 0 | **211** | **6** |
| IM-U371MR | Bacteria (Domain) | | | | | | 60 | 0 | 50 | 55 | 79 | 22 | 22 | 0 | **288** | **6** |
| IM-R6NR41 | Bacteria (Domain) | | | | | | 0 | 0 | 0 | 0 | 24 | 0 | 0 | 0 | **24** | **1** |
| IM-GZ88W2 | Bacteria (Domain) | | | | | | 0 | 0 | 0 | 28 | 0 | 0 | 0 | 0 | **28** | **1** |
| IM-K68NC4 | Bacteria (Domain) | | | | | | 49 | 53 | 60 | 24 | 53 | 55 | 43 | 0 | **337** | **7** |
| IM-I2443B | Bacteria (Domain) | | | | | | 0 | 0 | 28 | 52 | 27 | 0 | 0 | 0 | **107** | **3** |
| IM-L0OA07 | Bacteria (Domain) | | | | | | 0 | 46 | 43 | 31 | 0 | 22 | 26 | 0 | **168** | **5** |
| IM-J586ZT | Bacteria (Domain) | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 0 | **19** | **1** |
| IM-6M3C4F | Bacteria (Domain) | | | | | | 29 | 0 | 0 | 0 | 0 | 22 | 0 | 0 | **51** | **2** |
| IM-C2PH21 | Bacteria (Domain) | | | | | | 0 | 33 | 0 | 0 | 0 | 30 | 33 | 0 | **96** | **3** |
| IM-X06GK2 | Bacteria (Domain) | | | | | | 0 | 0 | 33 | 31 | 0 | 0 | 0 | 0 | **64** | **2** |
| IM-9GBN48 | Bacteria (Domain) | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 23 | 36 | **59** | **2** |

# APPENDIX L DNA ANALYSIS

| NMSeqID | Phylum | Class | Order | Family | Genus | Species | Stations | | | | | | | | Total number of reads | Present at number of samples |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | ENV04 | ENV13 | ENV17 | ENV26 | ENV29 | ENV31 | ENV36 | ENV53 | | |
| IM-OGR558 | Bacteroidetes | | | | | | 30 | 0 | 34 | 63 | 38 | 24 | 23 | 0 | **212** | **6** |
| IM-ZC570M | Bacteroidetes | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | **25** | **1** |
| IM-2Y6F4P | Bacteroidetes | Bacteroidia | Bacteroidales | Marinilabiliaceae | | | 36 | 0 | 36 | 46 | 34 | 26 | 0 | 0 | **178** | **5** |
| IM-JY8Z25 | Bacteroidetes | Bacteroidia | Bacteroidales | | | | 339 | 57 | 443 | 399 | 356 | 210 | 126 | 31 | **1961** | **8** |
| IM-UIU138 | Bacteroidetes | Bacteroidia | Bacteroidales | | | | 167 | 41 | 175 | 266 | 180 | 121 | 70 | 0 | **1020** | **7** |
| IM-R1Y0X2 | Bacteroidetes | Bacteroidia | Bacteroidales | | | | 40 | 0 | 0 | 0 | 0 | 31 | 35 | 0 | **106** | **3** |
| IM-2G41TZ | Bacteroidetes | Bacteroidia | | | | | 23 | 38 | 0 | 0 | 0 | 0 | 41 | 52 | **154** | **4** |
| IM-059UGY | Bacteroidetes | Bacteroidia | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 28 | **28** | **1** |
| IM-NK91T0 | Bacteroidetes | Bacteroidia | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 29 | 27 | **56** | **2** |
| IM-778OKJ | Bacteroidetes | Bacteroidia | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 36 | **36** | **1** |
| IM-0IZU92 | Bacteroidetes | Bacteroidia | | | | | 0 | 25 | 0 | 0 | 0 | 36 | 20 | 35 | **116** | **4** |
| IM-18V7KT | Bacteroidetes | Cytophagia | Cytophagales | Cytophagaceae | *Cytophaga* | | 0 | 27 | 0 | 0 | 0 | 0 | 28 | 48 | **103** | **3** |
| IM-7J9TV5 | Bacteroidetes | Cytophagia | Cytophagales | Flammeovirgaceae | | | 27 | 31 | 30 | 0 | 0 | 0 | 21 | 0 | **109** | **4** |
| IM-0CY31C | Bacteroidetes | Cytophagia | Cytophagales | | | | 155 | 193 | 207 | 135 | 122 | 152 | 116 | 0 | **1080** | **7** |
| IM-8KRI74 | Bacteroidetes | Cytophagia | Cytophagales | | | | 28 | 40 | 0 | 0 | 0 | 33 | 35 | 86 | **222** | **5** |
| IM-ZT39H7 | Bacteroidetes | Cytophagia | Cytophagales | | | | 0 | 38 | 0 | 0 | 0 | 36 | 49 | 51 | **174** | **4** |
| IM-8S5D1Q | Bacteroidetes | Cytophagia | Cytophagales | | | | 53 | 35 | 46 | 23 | 36 | 41 | 39 | 0 | **273** | **7** |
| IM-JJI383 | Bacteroidetes | Cytophagia | Cytophagales | | | | 0 | 0 | 0 | 0 | 0 | 0 | 24 | 52 | **76** | **2** |
| IM-0U84NM | Bacteroidetes | Cytophagia | Cytophagales | | | | 40 | 42 | 39 | 0 | 42 | 52 | 24 | 0 | **239** | **6** |
| IM-L4878E | Bacteroidetes | Flavobacteria | Flavobacteriales | Flavobacteriaceae | *Lutibacter* | | 51 | 0 | 51 | 23 | 43 | 24 | 35 | 0 | **227** | **6** |
| IM-Z9H3N2 | Bacteroidetes | Flavobacteria | Flavobacteriales | Flavobacteriaceae | *Maribacter* | | 0 | 0 | 0 | 0 | 33 | 28 | 44 | 32 | **137** | **4** |
| IM-X9VD85 | Bacteroidetes | Flavobacteria | Flavobacteriales | Flavobacteriaceae | | | 148 | 107 | 152 | 31 | 111 | 173 | 144 | 32 | **898** | **8** |
| IM-72SEM7 | Bacteroidetes | Flavobacteria | Flavobacteriales | Flavobacteriaceae | | | 32 | 0 | 0 | 0 | 0 | 0 | 0 | 78 | **110** | **2** |
| IM-8G8T9O | Bacteroidetes | Flavobacteria | Flavobacteriales | Flavobacteriaceae | | | 53 | 28 | 30 | 0 | 56 | 43 | 54 | 0 | **264** | **6** |
| IM-9J8C20 | Bacteroidetes | Flavobacteria | Flavobacteriales | Flavobacteriaceae | | | 0 | 25 | 0 | 0 | 27 | 0 | 21 | 0 | **73** | **3** |
| IM-OS03R5 | Bacteroidetes | Flavobacteria | Flavobacteriales | Flavobacteriaceae | | | 36 | 43 | 28 | 0 | 0 | 52 | 74 | 38 | **271** | **6** |
| IM-Q7L6J6 | Bacteroidetes | Flavobacteria | Flavobacteriales | Schleiferiaceae | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 36 | **36** | **1** |
| IM-6X38KG | Bacteroidetes | Ignavibacteria | Ignavibacteriales | | | | 36 | 54 | 0 | 71 | 39 | 34 | 36 | 142 | **412** | **7** |
| IM-U7JA08 | Bacteroidetes | Sphingobacteria | Sphingobacteriales | Saprospiraceae | | | 0 | 32 | 0 | 0 | 0 | 26 | 32 | 0 | **90** | **3** |
| IM-CJ476W | Bacteroidetes | Sphingobacteria | Sphingobacteriales | Saprospiraceae | | | 0 | 26 | 0 | 0 | 0 | 0 | 27 | 0 | **53** | **2** |
| IM-IW2J78 | Chloroflexi | Anaerolineae | Anaerolineales | Anaerolineaceae | | | 381 | 156 | 359 | 653 | 381 | 289 | 156 | 0 | **2375** | **7** |
| IM-LB11W2 | Chloroflexi | Anaerolineae | Anaerolineales | Anaerolineaceae | | | 93 | 0 | 211 | 190 | 104 | 64 | 35 | 0 | **697** | **6** |
| IM-EWD208 | Chloroflexi | Anaerolineae | Anaerolineales | Anaerolineaceae | | | 24 | 0 | 60 | 59 | 28 | 0 | 0 | 0 | **171** | **4** |
| IM-90A6EZ | Chloroflexi | Anaerolineae | Anaerolineales | Anaerolineaceae | | | 53 | 86 | 166 | 112 | 133 | 82 | 118 | 51 | **801** | **8** |
| IM-34P1FX | Chloroflexi | Anaerolineae | Anaerolineales | Anaerolineaceae | | | 27 | 0 | 66 | 49 | 38 | 0 | 0 | 0 | **180** | **4** |
| IM-Q35Q9L | Chloroflexi | Anaerolineae | Anaerolineales | Anaerolineaceae | | | 0 | 0 | 38 | 0 | 53 | 31 | 28 | 23 | **173** | **5** |
| IM-4B00FE | Chloroflexi | Anaerolineae | Anaerolineales | Anaerolineaceae | | | 30 | 0 | 43 | 61 | 39 | 24 | 0 | 0 | **197** | **5** |
| IM-L81TT9 | Chloroflexi | Anaerolineae | Anaerolineales | Anaerolineaceae | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 34 | **34** | **1** |
| IM-48N8AX | Chloroflexi | Anaerolineae | Anaerolineales | Anaerolineaceae | | | 0 | 0 | 0 | 31 | 22 | 0 | 0 | 0 | **53** | **2** |
| IM-X4Q6G8 | Chloroflexi | Anaerolineae | Anaerolineales | Anaerolineaceae | | | 28 | 0 | 28 | 68 | 30 | 0 | 0 | 0 | **154** | **4** |
| IM-YH5Y54 | Chloroflexi | Anaerolineae | Anaerolineales | Anaerolineaceae | | | 37 | 0 | 38 | 37 | 40 | 27 | 23 | 0 | **202** | **6** |
| IM-42UA4S | Chloroflexi | Anaerolineae | Anaerolineales | Anaerolineaceae | | | 0 | 0 | 35 | 31 | 0 | 0 | 0 | 0 | **66** | **2** |
| IM-WG47Y2 | Chloroflexi | Anaerolineae | Anaerolineales | Anaerolineaceae | | | 0 | 0 | 0 | 28 | 0 | 0 | 0 | 0 | **28** | **1** |
| IM-0NR66I | Chloroflexi | Anaerolineae | Anaerolineales | Anaerolineaceae | | | 0 | 0 | 0 | 35 | 31 | 0 | 0 | 0 | **66** | **2** |
| IM-4HUR17 | Chloroflexi | Anaerolineae | Anaerolineales | | | | 83 | 0 | 99 | 0 | 117 | 93 | 59 | 0 | **451** | **5** |
| IM-8WGT08 | Chloroflexi | Anaerolineae | | | | | 51 | 0 | 39 | 61 | 41 | 28 | 20 | 0 | **240** | **6** |
| IM-Y84O8O | Chloroflexi | Dehalococcoidia | Dehalococcoidales | Dehalococcoidaceae | | | 0 | 0 | 55 | 110 | 22 | 0 | 0 | 0 | **187** | **3** |
| IM-J4J1P7 | Cyanobacteria | Cyanophyceae | Synechococcales | Synechococcaceae | *Synechococcus* | | 0 | 37 | 0 | 0 | 0 | 27 | 0 | 0 | **64** | **2** |
| IM-2QW05X | Fusobacteria | Fusobacteria | Fusobacteriales | Fusobacteriaceae | | | 0 | 0 | 0 | 129 | 0 | 0 | 0 | 0 | **129** | **1** |
| IM-X651GG | Gemmatimonadetes | | | | | | 40 | 0 | 87 | 71 | 52 | 33 | 28 | 0 | **311** | **6** |
| IM-2S0UH4 | Gemmatimonadetes | | | | | | 50 | 0 | 90 | 73 | 74 | 29 | 25 | 0 | **341** | **6** |
| IM-09X4UP | Latescibacterota | | | | | | 31 | 0 | 40 | 0 | 35 | 22 | 0 | 0 | **128** | **4** |
| IM-2C0F4I | Myxococcota | | | | | | 41 | 0 | 54 | 53 | 49 | 30 | 23 | 0 | **250** | **6** |
| IM-M40BD6 | Nitrospirae | Nitrospira | Nitrospirales | Nitrospiraceae | | | 139 | 111 | 91 | 399 | 154 | 106 | 35 | 31 | **1066** | **8** |

# APPENDIX L DNA ANALYSIS

| NMSeqID | Phylum | Class | Order | Family | Genus | Species | Stations | | | | | | | | Total number of reads | Present at number of samples |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | ENV04 | ENV13 | ENV17 | ENV26 | ENV29 | ENV31 | ENV36 | ENV53 | | |
| IM-7JD04A | Nitrospirae | Nitrospira | Nitrospirales | Nitrospiraceae | | | 45 | 0 | 0 | 99 | 39 | 30 | 0 | 0 | **213** | **4** |
| IM-N5YW8V | Nitrospirae | Nitrospira | Nitrospirales | Nitrospiraceae | | | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | **30** | **1** |
| IM-6JV55Y | Nitrospirae | Thermodesulfovibrionia | Thermodesulfovibrionale | Thermodesulfovibrionacea | | | 0 | 0 | 31 | 53 | 0 | 0 | 0 | 0 | **84** | **2** |
| IM-E90UX8 | Planctomycetes | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 75 | **75** | **1** |
| IM-190FLF | Planctomycetes | | | | | | 26 | 0 | 47 | 0 | 0 | 24 | 27 | 0 | **124** | **4** |
| IM-9K1KA3 | Planctomycetes | | | | | | 0 | 38 | 0 | 0 | 0 | 0 | 0 | 89 | **127** | **2** |
| IM-5GP54X | Planctomycetes | | | | | | 0 | 44 | 53 | 0 | 0 | 38 | 22 | 107 | **264** | **5** |
| IM-2E99SQ | Planctomycetes | | | | | | 0 | 105 | 71 | 0 | 0 | 22 | 24 | 238 | **460** | **5** |
| IM-6T62EX | Planctomycetes | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 60 | **60** | **1** |
| IM-BWT979 | Planctomycetes | | | | | | 0 | 34 | 0 | 0 | 0 | 0 | 0 | 34 | **68** | **2** |
| IM-6CLH52 | Planctomycetes | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 28 | **28** | **1** |
| IM-4CO9U5 | Planctomycetes | | | | | | 0 | 54 | 48 | 0 | 0 | 0 | 0 | 62 | **164** | **3** |
| IM-17N6FL | Planctomycetes | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 41 | **41** | **1** |
| IM-P1ZD99 | Planctomycetes | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 45 | **45** | **1** |
| IM-8V3LI9 | Planctomycetes | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | **20** | **1** |
| IM-4Z74D0 | Planctomycetes | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 56 | **56** | **1** |
| IM-DX311R | Planctomycetes | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 80 | **80** | **1** |
| IM-H13B2G | Planctomycetes | | | | | | 0 | 28 | 0 | 0 | 0 | 0 | 0 | 28 | **56** | **2** |
| IM-6MU8W6 | Planctomycetes | | | | | | 0 | 44 | 31 | 0 | 0 | 0 | 0 | 87 | **162** | **3** |
| IM-6J6W7I | Planctomycetes | | | | | | 29 | 81 | 37 | 0 | 22 | 29 | 0 | 132 | **330** | **6** |
| IM-D3B8S2 | Planctomycetes | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 44 | **44** | **1** |
| IM-6P77W8 | Planctomycetes | | | | | | 0 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | **43** | **1** |
| IM-E769DC | Planctomycetes | Phycisphaerae | Phycisphaerales | Phycisphaeraceae | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 26 | **26** | **1** |
| IM-VRZ854 | Planctomycetes | Phycisphaerae | Phycisphaerales | Phycisphaeraceae | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 33 | **33** | **1** |
| IM-W9M68X | Planctomycetes | Planctomycetacia | Planctomycetales | Planctomycetaceae | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 35 | **35** | **1** |
| IM-484ZNH | Planctomycetes | Planctomycetacia | Planctomycetales | Planctomycetaceae | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 49 | **49** | **1** |
| IM-S056NK | Planctomycetes | Planctomycetacia | Planctomycetales | | | | 0 | 196 | 82 | 0 | 0 | 0 | 22 | 897 | **1197** | **4** |
| IM-L21X2F | Planctomycetes | Planctomycetacia | Planctomycetales | | | | 97 | 428 | 306 | 40 | 61 | 225 | 163 | 423 | **1743** | **8** |
| IM-UU016L | Planctomycetes | Planctomycetacia | Planctomycetales | | | | 0 | 62 | 0 | 0 | 0 | 0 | 0 | 153 | **215** | **2** |
| IM-B4VH11 | Planctomycetes | Planctomycetacia | Planctomycetales | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 91 | **91** | **1** |
| IM-SH56Z4 | Planctomycetes | Planctomycetacia | Planctomycetales | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 109 | **109** | **1** |
| IM-69U3ZY | Planctomycetes | Planctomycetacia | Planctomycetales | | | | 35 | 109 | 61 | 0 | 0 | 39 | 40 | 286 | **570** | **6** |
| IM-359YYJ | Planctomycetes | Planctomycetacia | Planctomycetales | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 82 | **82** | **1** |
| IM-1ZFY17 | Planctomycetes | Planctomycetacia | Planctomycetales | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 57 | **57** | **1** |
| IM-10CF8K | Planctomycetes | Planctomycetacia | Planctomycetales | | | | 76 | 0 | 70 | 49 | 58 | 27 | 31 | 0 | **311** | **6** |
| IM-9J8OCT | Planctomycetes | Planctomycetacia | Planctomycetales | | | | 26 | 0 | 58 | 0 | 0 | 0 | 0 | 0 | **84** | **2** |
| IM-2EQ6A0 | Planctomycetes | Planctomycetacia | Planctomycetales | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 45 | **45** | **1** |
| IM-RS526Y | Planctomycetes | Planctomycetacia | Planctomycetales | | | | 27 | 46 | 0 | 29 | 0 | 0 | 0 | 53 | **155** | **4** |
| IM-YMS387 | Planctomycetes | Planctomycetacia | Planctomycetales | | | | 0 | 35 | 46 | 0 | 0 | 0 | 0 | 24 | **105** | **3** |
| IM-Q8GF82 | Planctomycetes | Planctomycetacia | Planctomycetales | | | | 0 | 59 | 0 | 0 | 0 | 0 | 0 | 83 | **142** | **2** |
| IM-X777KR | Planctomycetes | Planctomycetacia | Planctomycetales | | | | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 76 | **106** | **2** |
| IM-U9JT87 | Planctomycetes | Planctomycetacia | Planctomycetales | | | | 22 | 60 | 62 | 23 | 0 | 34 | 0 | 0 | **201** | **5** |
| IM-D91GB4 | Planctomycetes | Planctomycetacia | Planctomycetales | | | | 22 | 0 | 0 | 0 | 25 | 0 | 20 | 0 | **67** | **3** |
| IM-08CY5D | Planctomycetes | Planctomycetacia | Planctomycetales | | | | 0 | 36 | 0 | 0 | 0 | 0 | 0 | 84 | **120** | **2** |
| IM-JUG499 | Planctomycetes | Planctomycetacia | Planctomycetales | | | | 0 | 26 | 59 | 0 | 0 | 0 | 0 | 33 | **118** | **3** |
| IM-40C2UP | Planctomycetes | Planctomycetacia | Planctomycetales | | | | 40 | 38 | 59 | 63 | 42 | 38 | 24 | 38 | **342** | **8** |
| IM-641UNU | Planctomycetes | Planctomycetacia | Planctomycetales | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 27 | **27** | **1** |
| IM-MO08V9 | Planctomycetes | Planctomycetacia | Planctomycetales | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 29 | **29** | **1** |
| IM-T5OL75 | Planctomycetes | Planctomycetacia | Planctomycetales | | | | 24 | 37 | 46 | 0 | 25 | 28 | 0 | 0 | **160** | **5** |
| IM-IO6R26 | Planctomycetes | Planctomycetacia | Planctomycetales | | | | 0 | 0 | 0 | 34 | 0 | 0 | 21 | 0 | **55** | **2** |
| IM-I35N9E | Planctomycetes | Planctomycetacia | Planctomycetales | | | | 0 | 32 | 0 | 0 | 0 | 0 | 0 | 0 | **32** | **1** |
| IM-X2G27W | Planctomycetes | Planctomycetacia | Planctomycetales | | | | 0 | 26 | 0 | 0 | 0 | 0 | 0 | 46 | **72** | **2** |
| IM-GT200W | Planctomycetes | Planctomycetacia | Planctomycetales | | | | 0 | 0 | 0 | 38 | 0 | 0 | 0 | 0 | **38** | **1** |
| IM-1S2JVG | Planctomycetes | Planctomycetacia | Planctomycetales | | | | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 0 | **19** | **1** |

# APPENDIX L DNA ANALYSIS

| NMSeqID | Phylum | Class | Order | Family | Genus | Species | Stations | | | | | | | | Total number of reads | Present at number of samples |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | ENV04 | ENV13 | ENV17 | ENV26 | ENV29 | ENV31 | ENV36 | ENV53 | | |
| IM-GJE372 | Planctomycetes | Planctomycetia | Pirellulales | Pirellulaceae | | | 0 | 31 | 31 | 0 | 0 | 0 | 0 | 0 | **62** | **2** |
| IM-WH08L3 | Proteobacteria | | | | | | 1053 | 177 | 682 | 1307 | 1019 | 589 | 252 | 38 | **5117** | **8** |
| IM-GA2A78 | Proteobacteria | | | | | | 294 | 446 | 567 | 455 | 346 | 262 | 212 | 202 | **2784** | **8** |
| IM-X6NV02 | Proteobacteria | | | | | | 409 | 598 | 808 | 728 | 453 | 494 | 355 | 208 | **4053** | **8** |
| IM-IDF373 | Proteobacteria | | | | | | 0 | 84 | 69 | 0 | 0 | 35 | 28 | 223 | **439** | **5** |
| IM-H32G6T | Proteobacteria | | | | | | 382 | 63 | 342 | 280 | 335 | 177 | 146 | 0 | **1725** | **7** |
| IM-1I8M7S | Proteobacteria | | | | | | 276 | 67 | 358 | 907 | 405 | 219 | 151 | 25 | **2408** | **8** |
| IM-3NJ5H9 | Proteobacteria | | | | | | 406 | 449 | 317 | 145 | 272 | 431 | 473 | 172 | **2665** | **8** |
| IM-60LPF9 | Proteobacteria | | | | | | 111 | 279 | 249 | 135 | 194 | 146 | 123 | 187 | **1424** | **8** |
| IM-X735NF | Proteobacteria | | | | | | 82 | 43 | 98 | 110 | 48 | 40 | 23 | 40 | **484** | **8** |
| IM-8P70MK | Proteobacteria | | | | | | 0 | 28 | 0 | 0 | 0 | 0 | 0 | 75 | **103** | **2** |
| IM-GO31Q4 | Proteobacteria | | | | | | 300 | 113 | 479 | 366 | 344 | 254 | 181 | 0 | **2037** | **7** |
| IM-6WJ7A7 | Proteobacteria | | | | | | 0 | 30 | 29 | 0 | 0 | 0 | 0 | 55 | **114** | **3** |
| IM-EPO161 | Proteobacteria | | | | | | 110 | 66 | 117 | 145 | 143 | 116 | 47 | 0 | **744** | **7** |
| IM-06LYO4 | Proteobacteria | | | | | | 50 | 0 | 91 | 86 | 67 | 52 | 50 | 32 | **428** | **7** |
| IM-1KZ30G | Proteobacteria | | | | | | 0 | 0 | 38 | 0 | 0 | 22 | 0 | 0 | **60** | **2** |
| IM-K963VZ | Proteobacteria | | | | | | 25 | 0 | 0 | 63 | 28 | 0 | 0 | 0 | **116** | **3** |
| IM-ZN81YI | Proteobacteria | | | | | | 0 | 0 | 0 | 44 | 24 | 0 | 0 | 0 | **68** | **2** |
| IM-L85KJ4 | Proteobacteria | | | | | | 47 | 48 | 61 | 54 | 43 | 59 | 61 | 0 | **373** | **7** |
| IM-2V64N0 | Proteobacteria | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 42 | **42** | **1** |
| IM-6LUDT8 | Proteobacteria | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 38 | **38** | **1** |
| IM-Q2P1T9 | Proteobacteria | | | | | | 0 | 0 | 0 | 24 | 25 | 0 | 0 | 0 | **49** | **2** |
| IM-6DP21E | Proteobacteria | | | | | | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 62 | **92** | **2** |
| IM-66TIF6 | Proteobacteria | | | | | | 25 | 0 | 0 | 58 | 34 | 35 | 0 | 0 | **152** | **4** |
| IM-RO8Q85 | Proteobacteria | | | | | | 29 | 0 | 0 | 37 | 34 | 0 | 0 | 0 | **100** | **3** |
| IM-7GB55W | Proteobacteria | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | **23** | **1** |
| IM-CFV734 | Proteobacteria | | | | | | 36 | 81 | 51 | 0 | 25 | 35 | 53 | 59 | **340** | **7** |
| IM-6R2O6M | Proteobacteria | | | | | | 0 | 0 | 0 | 35 | 0 | 0 | 0 | 0 | **35** | **1** |
| IM-8BT8Q3 | Proteobacteria | Alphaproteobacteria | Alphaproteobacteria inc | | *Methyloceanibacter* | *stevinii* | 35 | 39 | 78 | 0 | 37 | 46 | 40 | 0 | **275** | **6** |
| IM-6EO52Z | Proteobacteria | Alphaproteobacteria | Rhizobiales | Hyphomicrobiaceae | *Filomicrobium* | | 64 | 33 | 153 | 59 | 46 | 64 | 22 | 0 | **441** | **7** |
| IM-GX82X8 | Proteobacteria | Alphaproteobacteria | Rhizobiales | Hyphomicrobiaceae | *Hyphomicrobium* | | 87 | 214 | 237 | 75 | 64 | 98 | 69 | 128 | **972** | **8** |
| IM-1U3IK8 | Proteobacteria | Alphaproteobacteria | Rhizobiales | Hyphomicrobiaceae | | | 27 | 54 | 79 | 27 | 35 | 52 | 36 | 42 | **352** | **8** |
| IM-6QS4U3 | Proteobacteria | Alphaproteobacteria | Rhizobiales | Rhizobiaceae | | | 43 | 0 | 0 | 0 | 57 | 0 | 0 | 0 | **100** | **2** |
| IM-13WA2S | Proteobacteria | Alphaproteobacteria | Rhizobiales | Rhizobiaceae | | | 0 | 0 | 0 | 0 | 0 | 42 | 36 | 0 | **78** | **2** |
| IM-4UW8C7 | Proteobacteria | Alphaproteobacteria | Rhizobiales | | | | 22 | 66 | 59 | 0 | 34 | 36 | 35 | 37 | **289** | **7** |
| IM-FZ68F9 | Proteobacteria | Alphaproteobacteria | Rhizobiales | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 69 | **69** | **1** |
| IM-TF0Z30 | Proteobacteria | Alphaproteobacteria | Rhizobiales | | | | 28 | 25 | 0 | 0 | 0 | 0 | 20 | 32 | **105** | **4** |
| IM-A30P8F | Proteobacteria | Alphaproteobacteria | Sphingomonadales | Sphingomondaceae | *Parasphingopyxis* | *algicola* | 0 | 0 | 0 | 0 | 0 | 0 | 28 | 0 | **28** | **1** |
| IM-D5CZ54 | Proteobacteria | Alphaproteobacteria | Kiloniellales | Kiloniellaceae | | | 0 | 28 | 0 | 0 | 0 | 26 | 0 | 0 | **54** | **2** |
| IM-9N88RA | Proteobacteria | Alphaproteobacteria | Rhodobacterales | Rhodobacteraceae | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 46 | **46** | **1** |
| IM-KFC916 | Proteobacteria | Alphaproteobacteria | Rhodobacterales | Rhodobacteraceae | | | 44 | 49 | 38 | 0 | 55 | 68 | 73 | 31 | **358** | **7** |
| IM-YB95D4 | Proteobacteria | Alphaproteobacteria | Rhodobacterales | Rhodobacteraceae | | | 67 | 31 | 48 | 0 | 59 | 69 | 71 | 47 | **392** | **7** |
| IM-ZB735J | Proteobacteria | Alphaproteobacteria | Rhodobacterales | Rhodobacteraceae | | | 0 | 0 | 0 | 0 | 0 | 27 | 20 | 0 | **47** | **2** |
| IM-L8D9J3 | Proteobacteria | Alphaproteobacteria | Rhodobacterales | Rhodobacteraceae | | | 24 | 26 | 0 | 0 | 0 | 31 | 28 | 24 | **133** | **5** |
| IM-3MR6N2 | Proteobacteria | Alphaproteobacteria | Rhodobacterales | Rhodobacteraceae | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 27 | **27** | **1** |
| IM-Y33E4M | Proteobacteria | Alphaproteobacteria | Rhodobacterales | Rhodobacteraceae | | | 41 | 38 | 38 | 0 | 25 | 46 | 42 | 0 | **230** | **6** |
| IM-N787IX | Proteobacteria | Alphaproteobacteria | Rhodobacterales | | | | 0 | 27 | 32 | 0 | 0 | 44 | 35 | 0 | **138** | **4** |
| IM-Z3S14K | Proteobacteria | Alphaproteobacteria | Rhodospirillales | Rhodospirillaceae | | | 30 | 33 | 41 | 33 | 31 | 39 | 45 | 60 | **312** | **8** |
| IM-N55L5V | Proteobacteria | Alphaproteobacteria | Rhodospirillales | Rhodospirillaceae | | | 0 | 0 | 0 | 31 | 0 | 0 | 0 | 0 | **31** | **1** |
| IM-G3Q2W0 | Proteobacteria | Alphaproteobacteria | Rhodospirillales | Rhodospirillaceae | | | 0 | 0 | 29 | 0 | 0 | 0 | 26 | 24 | **79** | **3** |
| IM-Z606CA | Proteobacteria | Alphaproteobacteria | Rhodospirillales | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 38 | **38** | **1** |
| IM-72K6VM | Proteobacteria | Alphaproteobacteria | | | | | 0 | 220 | 98 | 0 | 0 | 0 | 0 | 31 | **349** | **3** |
| IM-9W3W5X | Proteobacteria | Alphaproteobacteria | | | | | 52 | 44 | 80 | 0 | 50 | 55 | 34 | 33 | **348** | **7** |
| IM-2X06KZ | Proteobacteria | Alphaproteobacteria | | | | | 0 | 0 | 0 | 23 | 0 | 0 | 22 | 39 | **84** | **3** |

# APPENDIX L DNA ANALYSIS

| NMSeqID | Phylum | Class | Order | Family | Genus | Species | Stations | | | | | | | | Total number of reads | Present at number of samples |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | ENV04 | ENV13 | ENV17 | ENV26 | ENV29 | ENV31 | ENV36 | ENV53 | | |
| IM-7HTT05 | Proteobacteria | Alphaproteobacteria | | | | | 31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **31** | **1** |
| IM-ED529U | Proteobacteria | Alphaproteobacteria | | | | | 0 | 27 | 31 | 22 | 28 | 24 | 0 | 55 | **187** | **6** |
| IM-Y63LT9 | Proteobacteria | Alphaproteobacteria | | | | | 0 | 35 | 0 | 0 | 0 | 22 | 19 | 0 | **76** | **3** |
| IM-AN28E2 | Proteobacteria | Alphaproteobacteria | | | | | 50 | 56 | 33 | 25 | 56 | 55 | 69 | 0 | **344** | **7** |
| IM-18CI5Y | Proteobacteria | Alphaproteobacteria | | | | | 40 | 32 | 38 | 0 | 29 | 37 | 42 | 0 | **218** | **6** |
| IM-A1NL69 | Proteobacteria | Alphaproteobacteria | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | **25** | **1** |
| IM-V2OPE3 | Proteobacteria | Alphaproteobacteria | | | | | 30 | 0 | 0 | 49 | 45 | 25 | 19 | 0 | **168** | **5** |
| IM-NS47W1 | Proteobacteria | Alphaproteobacteria | | | | | 23 | 37 | 0 | 0 | 25 | 26 | 23 | 44 | **178** | **6** |
| IM-2X3B5B | Proteobacteria | Alphaproteobacteria | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | **23** | **1** |
| IM-O136TP | Proteobacteria | Alphaproteobacteria | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 0 | **19** | **1** |
| IM-WD296N | Proteobacteria | Betaproteobacteria | Nitrosomonadales | Nitrosomonadaceae | | | 286 | 637 | 258 | 193 | 227 | 283 | 338 | 472 | **2694** | **8** |
| IM-8GO84O | Proteobacteria | Betaproteobacteria | Rhodocyclales | Rhodocyclaceae | *Denitratisoma* | | 93 | 0 | 0 | 93 | 53 | 100 | 71 | 79 | **489** | **6** |
| IM-J765LB | Proteobacteria | Deltaproteobacteria | Desulfobacterales | | | | 0 | 0 | 0 | 0 | 26 | 40 | 30 | 0 | **96** | **3** |
| IM-V783VO | Proteobacteria | Deltaproteobacteria | Desulfobacterales | Nitrospinaceae | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 27 | **27** | **1** |
| IM-29ITFV | Proteobacteria | Gammaproteobacteria | Vibrionales | Vibrionaceae | *Photobacterium* | *lipolyticum* | 0 | 0 | 0 | 27 | 0 | 0 | 0 | 0 | **27** | **1** |
| IM-5NU01J | Proteobacteria | Gammaproteobacteria | Chromatiales | Chromatiaceae | *Thioflavicoccus* | | 43 | 0 | 74 | 84 | 52 | 25 | 0 | 0 | **278** | **5** |
| IM-23BG6M | Proteobacteria | Gammaproteobacteria | Chromatiales | Chromatiaceae | | | 0 | 33 | 0 | 25 | 0 | 0 | 27 | 0 | **85** | **3** |
| IM-45Y2H1 | Proteobacteria | Gammaproteobacteria | Chromatiales | Thioalkalispiraceae | *Thioprofundum* | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 45 | **45** | **1** |
| IM-F77Y1N | Proteobacteria | Gammaproteobacteria | Chromatiales | | | | 31 | 0 | 0 | 0 | 27 | 30 | 21 | 55 | **164** | **5** |
| IM-IX67K6 | Proteobacteria | Gammaproteobacteria | Chromatiales | Ectothiorhodospiraceae | | | 25 | 0 | 0 | 0 | 0 | 0 | 35 | 156 | **216** | **3** |
| IM-L0K7E9 | Proteobacteria | Gammaproteobacteria | Chromatiales | Ectothiorhodospiraceae | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 33 | **33** | **1** |
| IM-19YI7A | Proteobacteria | Gammaproteobacteria | Chromatiales | Ectothiorhodospiraceae | *Thioalkalivibrio* | | 77 | 0 | 89 | 77 | 66 | 55 | 35 | 0 | **399** | **6** |
| IM-4K11FQ | Proteobacteria | Gammaproteobacteria | Nitrsococcales | Nitrosococcaceae | | | 52 | 25 | 31 | 69 | 45 | 0 | 23 | 756 | **1001** | **7** |
| IM-7HDRW8 | Proteobacteria | Gammaproteobacteria | Nitrsococcales | Nitrosococcaceae | | | 52 | 35 | 55 | 73 | 51 | 72 | 89 | 0 | **427** | **7** |
| IM-H5B15U | Proteobacteria | Gammaproteobacteria | Pseudomonadales | Halieaceae | | | 743 | 362 | 669 | 537 | 598 | 665 | 454 | 141 | **4169** | **8** |
| IM-NE200R | Proteobacteria | Gammaproteobacteria | Pseudomonadales | Halieaceae | | | 245 | 236 | 257 | 94 | 190 | 242 | 196 | 388 | **1848** | **8** |
| IM-R1DJ21 | Proteobacteria | Gammaproteobacteria | Pseudomonadales | Halieaceae | | | 182 | 73 | 170 | 55 | 160 | 151 | 132 | 53 | **976** | **8** |
| IM-93O0YK | Proteobacteria | Gammaproteobacteria | Pseudomonadales | Halieaceae | | | 69 | 75 | 58 | 22 | 58 | 75 | 49 | 58 | **464** | **8** |
| IM-7I42ZL | Proteobacteria | Gammaproteobacteria | Pseudomonadales | Halieaceae | | | 32 | 0 | 0 | 31 | 28 | 0 | 0 | 0 | **91** | **3** |
| IM-I5G8A4 | Proteobacteria | Gammaproteobacteria | Pseudomonadales | Halieaceae | | | 50 | 50 | 44 | 0 | 31 | 40 | 51 | 0 | **266** | **6** |
| IM-7QOK42 | Proteobacteria | Gammaproteobacteria | Alteromonadales | Alteromonadaceae | *Marinobacter* | | 0 | 28 | 0 | 25 | 23 | 0 | 21 | 0 | **97** | **4** |
| IM-8Q92XS | Proteobacteria | Gammaproteobacteria | Pseudomonadales | Pseudomonadaceae | | | 24 | 47 | 30 | 27 | 23 | 25 | 20 | 0 | **196** | **7** |
| IM-00HDK6 | Proteobacteria | Gammaproteobacteria | Oceanospirillales | Saccharospirillaceae | | | 0 | 0 | 0 | 0 | 0 | 0 | 22 | 0 | **22** | **1** |
| IM-76YQG0 | Proteobacteria | Gammaproteobacteria | Pseudomonadales | Spongiibacteraceae | | | 62 | 50 | 60 | 0 | 54 | 55 | 66 | 0 | **347** | **6** |
| IM-4T6QNH | Proteobacteria | Gammaproteobacteria | Pseudomonadales | Spongiibacteraceae | | | 0 | 32 | 0 | 0 | 0 | 0 | 0 | 0 | **32** | **1** |
| IM-V63Z5R | Proteobacteria | Gammaproteobacteria | Pseudomonadales | | | | 48 | 45 | 34 | 38 | 46 | 97 | 92 | 37 | **437** | **8** |
| IM-258AAC | Proteobacteria | Gammaproteobacteria | Pseudomonadales | | | | 56 | 118 | 48 | 72 | 59 | 62 | 71 | 76 | **562** | **8** |
| IM-D29KZ1 | Proteobacteria | Gammaproteobacteria | Pseudomonadales | | | | 48 | 82 | 0 | 44 | 47 | 48 | 37 | 43 | **349** | **7** |
| IM-0S48T2 | Proteobacteria | Gammaproteobacteria | Pseudomonadales | | | | 25 | 58 | 34 | 41 | 32 | 42 | 0 | 31 | **263** | **7** |
| IM-NT5Y11 | Proteobacteria | Gammaproteobacteria | Woeseiales | Woeseiaceae | *Woeseia* | | 96 | 333 | 169 | 105 | 85 | 145 | 92 | 161 | **1186** | **8** |
| IM-81V2ZK | Proteobacteria | Gammaproteobacteria | Woeseiales | Woeseiaceae | *Woeseia* | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | **25** | **1** |
| IM-ND2N43 | Proteobacteria | Gammaproteobacteria | Arenicellales | Arenicellaceae | *Arenicella* | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 87 | **87** | **1** |
| IM-NS876X | Proteobacteria | Gammaproteobacteria | Arenicellales | Arenicellaceae | *Arenicella* | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 46 | **46** | **1** |
| IM-01YY9S | Proteobacteria | Gammaproteobacteria | Arenicellales | Arenicellaceae | *Arenicella* | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | **25** | **1** |
| IM-W706UB | Proteobacteria | Gammaproteobacteria | AKS1 | | *Sulfuriflexus* | | 27 | 0 | 68 | 24 | 22 | 29 | 22 | 0 | **192** | **6** |
| IM-49D8MH | Proteobacteria | Gammaproteobacteria | | | | | 1401 | 1824 | 850 | 872 | 1348 | 1478 | 1444 | 2020 | **11237** | **8** |
| IM-9QCQ08 | Proteobacteria | Gammaproteobacteria | | | | | 931 | 1742 | 644 | 834 | 831 | 1082 | 981 | 1313 | **8358** | **8** |
| IM-U2CB84 | Proteobacteria | Gammaproteobacteria | | | | | 1163 | 610 | 1553 | 1811 | 1319 | 1411 | 1187 | 168 | **9222** | **8** |
| IM-I953ZY | Proteobacteria | Gammaproteobacteria | | | | | 0 | 111 | 67 | 0 | 0 | 31 | 21 | 866 | **1096** | **5** |
| IM-B13E5X | Proteobacteria | Gammaproteobacteria | | | | | 558 | 780 | 1109 | 618 | 459 | 1034 | 645 | 99 | **5302** | **8** |
| IM-5E5B5X | Proteobacteria | Gammaproteobacteria | | | | | 407 | 854 | 264 | 410 | 417 | 415 | 424 | 905 | **4096** | **8** |
| IM-IX0B54 | Proteobacteria | Gammaproteobacteria | | | | | 690 | 587 | 562 | 616 | 650 | 728 | 551 | 110 | **4494** | **8** |
| IM-T3W3O7 | Proteobacteria | Gammaproteobacteria | | | | | 346 | 213 | 421 | 196 | 201 | 281 | 227 | 79 | **1964** | **8** |
| IM-T0UX87 | Proteobacteria | Gammaproteobacteria | | | | | 60 | 142 | 32 | 34 | 50 | 81 | 97 | 166 | **662** | **8** |

# APPENDIX L DNA ANALYSIS

| NMSeqID | Phylum | Class | Order | Family | Genus | Species | Stations | | | | | | | | Total number of reads | Present at number of samples |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | ENV04 | ENV13 | ENV17 | ENV26 | ENV29 | ENV31 | ENV36 | ENV53 | | |
| IM-RUF397 | Proteobacteria | Gammaproteobacteria | | | | | 87 | 169 | 81 | 62 | 54 | 91 | 84 | 218 | **846** | **8** |
| IM-4D4HUE | Proteobacteria | Gammaproteobacteria | | | | | 65 | 0 | 28 | 242 | 123 | 157 | 141 | 0 | **756** | **6** |
| IM-DR413B | Proteobacteria | Gammaproteobacteria | | | | | 255 | 125 | 168 | 120 | 136 | 170 | 142 | 117 | **1233** | **8** |
| IM-77D6UW | Proteobacteria | Gammaproteobacteria | | | | | 0 | 33 | 0 | 0 | 0 | 0 | 0 | 132 | **165** | **2** |
| IM-99MKM8 | Proteobacteria | Gammaproteobacteria | | | | | 0 | 234 | 0 | 0 | 0 | 0 | 25 | 158 | **417** | **3** |
| IM-QB00E0 | Proteobacteria | Gammaproteobacteria | | | | | 86 | 69 | 42 | 61 | 99 | 92 | 74 | 67 | **590** | **8** |
| IM-96M8UE | Proteobacteria | Gammaproteobacteria | | | | | 497 | 210 | 334 | 313 | 393 | 372 | 242 | 121 | **2482** | **8** |
| IM-V7WB13 | Proteobacteria | Gammaproteobacteria | | | | | 174 | 58 | 145 | 75 | 156 | 108 | 76 | 25 | **817** | **8** |
| IM-3AQ5M3 | Proteobacteria | Gammaproteobacteria | | | | | 100 | 165 | 63 | 72 | 72 | 69 | 97 | 133 | **771** | **8** |
| IM-0R7L4V | Proteobacteria | Gammaproteobacteria | | | | | 360 | 177 | 367 | 198 | 298 | 237 | 160 | 106 | **1903** | **8** |
| IM-974OMY | Proteobacteria | Gammaproteobacteria | | | | | 114 | 183 | 54 | 91 | 96 | 101 | 124 | 129 | **892** | **8** |
| IM-TPX572 | Proteobacteria | Gammaproteobacteria | | | | | 151 | 142 | 225 | 208 | 176 | 177 | 125 | 42 | **1246** | **8** |
| IM-1EDT50 | Proteobacteria | Gammaproteobacteria | | | | | 0 | 55 | 0 | 0 | 0 | 0 | 0 | 183 | **238** | **2** |
| IM-R8Y41G | Proteobacteria | Gammaproteobacteria | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 88 | **88** | **1** |
| IM-U06KH7 | Proteobacteria | Gammaproteobacteria | | | | | 128 | 200 | 145 | 80 | 116 | 106 | 98 | 45 | **918** | **8** |
| IM-C0X5T6 | Proteobacteria | Gammaproteobacteria | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 108 | **108** | **1** |
| IM-23AKR5 | Proteobacteria | Gammaproteobacteria | | | | | 111 | 252 | 96 | 53 | 74 | 148 | 194 | 294 | **1222** | **8** |
| IM-KJ34P0 | Proteobacteria | Gammaproteobacteria | | | | | 97 | 61 | 138 | 56 | 98 | 122 | 49 | 0 | **621** | **7** |
| IM-80MH5A | Proteobacteria | Gammaproteobacteria | | | | | 118 | 0 | 106 | 75 | 145 | 69 | 109 | 0 | **622** | **6** |
| IM-P3O7K8 | Proteobacteria | Gammaproteobacteria | | | | | 65 | 55 | 31 | 23 | 39 | 58 | 45 | 0 | **316** | **7** |
| IM-394PXE | Proteobacteria | Gammaproteobacteria | | | | | 34 | 48 | 29 | 0 | 0 | 44 | 46 | 68 | **269** | **6** |
| IM-A8L0X2 | Proteobacteria | Gammaproteobacteria | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | **50** | **1** |
| IM-5OZ24P | Proteobacteria | Gammaproteobacteria | | | | | 47 | 57 | 38 | 33 | 33 | 26 | 45 | 128 | **407** | **8** |
| IM-59MWC2 | Proteobacteria | Gammaproteobacteria | | | | | 78 | 128 | 37 | 38 | 76 | 113 | 89 | 64 | **623** | **8** |
| IM-I0CO15 | Proteobacteria | Gammaproteobacteria | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 61 | **61** | **1** |
| IM-78KK9U | Proteobacteria | Gammaproteobacteria | | | | | 49 | 47 | 45 | 0 | 54 | 65 | 76 | 0 | **336** | **6** |
| IM-53LV9H | Proteobacteria | Gammaproteobacteria | | | | | 41 | 47 | 33 | 22 | 30 | 41 | 50 | 30 | **294** | **8** |
| IM-37PXV9 | Proteobacteria | Gammaproteobacteria | | | | | 64 | 0 | 35 | 31 | 55 | 41 | 26 | 0 | **252** | **6** |
| IM-2N2D1O | Proteobacteria | Gammaproteobacteria | | | | | 25 | 42 | 42 | 56 | 38 | 56 | 66 | 31 | **356** | **8** |
| IM-64M6WE | Proteobacteria | Gammaproteobacteria | | | | | 33 | 49 | 0 | 0 | 21 | 51 | 58 | 0 | **212** | **5** |
| IM-03ZO7V | Proteobacteria | Gammaproteobacteria | | | | | 0 | 53 | 0 | 0 | 0 | 0 | 27 | 77 | **157** | **3** |
| IM-S67DWK | Proteobacteria | Gammaproteobacteria | | | | | 27 | 26 | 36 | 24 | 43 | 47 | 45 | 43 | **291** | **8** |
| IM-S268EN | Proteobacteria | Gammaproteobacteria | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 32 | **52** | **2** |
| IM-QS76Q8 | Proteobacteria | Gammaproteobacteria | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 39 | **39** | **1** |
| IM-QB546V | Proteobacteria | Gammaproteobacteria | | | | | 54 | 0 | 0 | 47 | 27 | 24 | 0 | 0 | **152** | **4** |
| IM-19UH8S | Proteobacteria | Gammaproteobacteria | | | | | 0 | 32 | 0 | 0 | 0 | 0 | 0 | 56 | **88** | **2** |
| IM-54KW0L | Proteobacteria | Gammaproteobacteria | | | | | 0 | 68 | 0 | 0 | 0 | 0 | 27 | 53 | **148** | **3** |
| IM-N3F2P9 | Proteobacteria | Gammaproteobacteria | | | | | 35 | 0 | 0 | 41 | 40 | 0 | 0 | 0 | **116** | **3** |
| IM-4EJ60E | Proteobacteria | Gammaproteobacteria | | | | | 24 | 0 | 0 | 46 | 40 | 0 | 19 | 0 | **129** | **4** |
| IM-E1O62E | Proteobacteria | Gammaproteobacteria | | | | | 26 | 0 | 28 | 0 | 29 | 23 | 38 | 60 | **204** | **6** |
| IM-OT10A5 | Proteobacteria | Gammaproteobacteria | | | | | 0 | 32 | 0 | 0 | 0 | 27 | 26 | 0 | **85** | **3** |
| IM-7C7FR3 | Proteobacteria | Gammaproteobacteria | | | | | 0 | 32 | 0 | 0 | 0 | 0 | 0 | 0 | **32** | **1** |
| IM-737EU1 | Proteobacteria | Gammaproteobacteria | | | | | 0 | 0 | 0 | 34 | 0 | 0 | 0 | 0 | **34** | **1** |
| IM-JV047W | Proteobacteria | Gammaproteobacteria | | | | | 0 | 47 | 0 | 0 | 0 | 38 | 45 | 0 | **130** | **3** |
| IM-3U99PX | Proteobacteria | Gammaproteobacteria | | | | | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | **25** | **1** |
| IM-0O3I5U | Proteobacteria | Gammaproteobacteria | | | | | 0 | 27 | 0 | 0 | 0 | 0 | 0 | 33 | **60** | **2** |
| IM-4U8BT6 | Proteobacteria | Gammaproteobacteria | | | | | 50 | 37 | 38 | 22 | 39 | 44 | 42 | 0 | **272** | **7** |
| IM-O2F7D3 | Proteobacteria | Gammaproteobacteria | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 76 | **76** | **1** |
| IM-GS923C | Proteobacteria | Gammaproteobacteria | | | | | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **22** | **1** |
| IM-8FIZ22 | Proteobacteria | Gammaproteobacteria | | | | | 24 | 0 | 0 | 0 | 23 | 0 | 0 | 0 | **47** | **2** |
| IM-2MSW8S | Proteobacteria | Gammaproteobacteria | | | | | 0 | 0 | 0 | 22 | 0 | 0 | 0 | 0 | **22** | **1** |
| IM-77L33B | Proteobacteria | Gammaproteobacteria | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 49 | **49** | **1** |
| IM-36OSH0 | Proteobacteria | Gammaproteobacteria | | | | | 0 | 29 | 0 | 0 | 0 | 0 | 0 | 26 | **55** | **2** |
| IM-R27MG4 | Proteobacteria | Gammaproteobacteria | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | **25** | **1** |

# APPENDIX L DNA ANALYSIS

| NMSeqID | Phylum | Class | Order | Family | Genus | Species | Stations | | | | | | | | Total number of reads | Present at number of samples |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | ENV04 | ENV13 | ENV17 | ENV26 | ENV29 | ENV31 | ENV36 | ENV53 | | |
| IM-55DIB3 | Proteobacteria | Gammaproteobacteria | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 37 | **37** | **1** |
| IM-A9H5D8 | Spirochaetes | Spirochaetes(Class) | Spirochaetales | Spirochaetaceae | | | 0 | 0 | 0 | 35 | 0 | 0 | 0 | 0 | **35** | **1** |
| IM-4Q79JO | Verrucomicrobia | | | | | | 44 | 0 | 0 | 29 | 27 | 30 | 0 | 0 | **130** | **4** |
| IM-S3E2K5 | Verrucomicrobia | Kiritimatiellae | | | | | 25 | 0 | 31 | 0 | 0 | 0 | 0 | 0 | **56** | **2** |
| IM-20B1SS | Verrucomicrobia | Kiritimatiellae | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 31 | **31** | **1** |
| IM-37W3GI | Verrucomicrobia | Kiritimatiellae | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 39 | **39** | **1** |
| IM-0B5W0P | Verrucomicrobia | Verrucomicrobiae | Verrucomicrobiales | Akkermansiaceae | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | **23** | **1** |
| IM-1MM9Y3 | Verrucomicrobia | Verrucomicrobiae | Verrucomicrobiales | Verrucomicrobiaceae | | | 36 | 50 | 0 | 0 | 21 | 52 | 44 | 0 | **203** | **5** |
| IM-P4DD88 | Verrucomicrobia | Verrucomicrobiae | Verrucomicrobiales | Verrucomicrobiaceae | | | 34 | 27 | 41 | 0 | 40 | 41 | 19 | 36 | **238** | **7** |
| IM-Y5F3D4 | Verrucomicrobia | Verrucomicrobiae | Verrucomicrobiales | Verrucomicrobiaceae | | | 0 | 35 | 46 | 0 | 0 | 0 | 0 | 0 | **81** | **2** |
| IM-8AFC89 | Verrucomicrobia | Verrucomicrobiae | Verrucomicrobiales | | | | 0 | 26 | 0 | 0 | 0 | 0 | 25 | 63 | **114** | **3** |
| | | | | | | **Number of Reads** | **30001** | **33335** | **40419** | **31276** | **28640** | **29538** | **25128** | **29803** | **248140** | |
| | | | | | | **Number of OTUs** | **230** | **231** | **232** | **214** | **230** | **230** | **240** | **245** | **443** | |

# APPENDIX L DNA ANALYSIS

| NMSeqID | Phylum | Class | Order | Family | Genus | Species | Samples | | | | | | | | Total number of reads | Present at number of samples (out of 8) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | ENV04 | ENV13 | ENV17 | ENV26 | ENV29 | ENV31 | ENV36 | ENV53 | | |
| IM-2AP2NM | Annelida | Polychaeta | Phyllodocida | Hesionidae | *Podarkeopsis* | *helgolandicus* | 0 | 0 | 0 | 0 | 66 | 0 | 0 | 0 | **66** | **1** |
| IM-4KHT5C | Annelida | Polychaeta | Phyllodocida | Nephtyidae | *Nephtys* | *kersivalensis* | 0 | 29 | 0 | 0 | 0 | 0 | 0 | 0 | **29** | **1** |
| IM-81ZZ24 | Annelida | Polychaeta | Phyllodocida | Syllidae | *Streptosyllis* | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 149 | **149** | **1** |
| IM-1J519V | Annelida | Polychaeta | Phyllodocida | | | | 0 | 1784 | 0 | 0 | 0 | 0 | 0 | 0 | **1784** | **1** |
| IM-8T2M61 | Annelida | Polychaeta | | Oweniidae | *Galathowenia* | *oculata* | 809 | 0 | 0 | 0 | 0 | 572 | 0 | 0 | **1381** | **2** |
| IM-21TY42 | Annelida | Polychaeta | Spionida | Spionidae | *Prionospio* | *dubia* | 0 | 0 | 0 | 0 | 1672 | 16 | 0 | 0 | **1688** | **2** |
| IM-OO85FM | Annelida | Polychaeta | Spionida | | | | 0 | 0 | 0 | 0 | 0 | 5101 | 50 | 0 | **5151** | **2** |
| IM-W05Q4S | Annelida | Polychaeta | Spionida | | | | 0 | 0 | 385 | 0 | 0 | 0 | 1388 | 0 | **1773** | **2** |
| IM-N9709Q | Annelida | Polychaeta | Spionida | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 91 | **91** | **1** |
| IM-1GUTR7 | Annelida | Polychaeta | Terebellida | Cirratulidae | *Chaetozone* | | 0 | 0 | 280 | 0 | 0 | 1413 | 243 | 0 | **1936** | **3** |
| IM-S76I52 | Annelida | Polychaeta | Terebellida | Cirratulidae | *Chaetozone* | | 0 | 0 | 0 | 0 | 0 | 0 | 116 | 0 | **116** | **1** |
| IM-7HJ284 | Annelida | Polychaeta | Terebellida | Cirratulidae | *Tharyx* | | 0 | 0 | 0 | 0 | 0 | 1693 | 0 | 0 | **1693** | **1** |
| IM-1E26WF | Annelida | Polychaeta | Terebellida | | | | 0 | 0 | 0 | 0 | 0 | 0 | 86 | 0 | **86** | **1** |
| IM-9MUQ9R | Annelida | Polychaeta | Terebellida | | | | 0 | 0 | 0 | 0 | 0 | 66 | 0 | 0 | **66** | **1** |
| IM-J7BG3Q | Annelida | Polychaeta | Terebellida | | | | 0 | 0 | 0 | 0 | 19 | 0 | 0 | 0 | **19** | **1** |
| IM-O28VKC | Annelida | Polychaeta | | Paraonidae | *Aricidea* | *laubieri* | 0 | 0 | 0 | 0 | 31 | 0 | 0 | 0 | **31** | **1** |
| IM-NXV1H3 | Annelida | Polychaeta | | | | | 3393 | 0 | 0 | 18661 | 0 | 0 | 0 | 0 | **22054** | **2** |
| IM-I2Y4K4 | Annelida | Polychaeta | | | | | 0 | 0 | 53602 | 0 | 0 | 41 | 0 | 0 | **53643** | **2** |
| IM-22Z3V2 | Annelida | Polychaeta | | | | | 0 | 0 | 0 | 0 | 0 | 47 | 79 | 0 | **126** | **2** |
| IM-789Y2X | Annelida | Polychaeta | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 44 | **44** | **1** |
| IM-G7KP25 | Arthropoda | Copepoda | Calanoida | Temoridae | *Temora* | *longicornis* | 0 | 0 | 0 | 0 | 0 | 129 | 0 | 0 | **129** | **1** |
| IM-905K0O | Arthropoda | Copepoda | Harpacticoida | Ameiridae | *Proameira* | | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | **30** | **1** |
| IM-1EXII3 | Arthropoda | Copepoda | Harpacticoida | Ameiridae | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1091 | **1091** | **1** |
| IM-VX6OM8 | Arthropoda | Copepoda | Harpacticoida | Ectinosomatidae | | | 0 | 0 | 0 | 0 | 0 | 0 | 85 | 0 | **85** | **1** |
| IM-0O7JP0 | Arthropoda | Copepoda | Harpacticoida | Laophontidae | Laophonte | longicaudata | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | **43** | **1** |
| IM-HUGN94 | Arthropoda | Copepoda | Harpacticoida | Leptastacidae | Leptastacus | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 190 | **190** | **1** |
| IM-XF2R1Z | Arthropoda | Copepoda | Harpacticoida | Leptopontiidae | Leptopontia | flandrica | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | **24** | **1** |
| IM-F29G97 | Arthropoda | Copepoda | Harpacticoida | Miraciidae | Haloschizopera | pygmaea | 0 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | **100** | **1** |
| IM-8J5ZK0 | Arthropoda | Copepoda | Harpacticoida | Miraciidae | Haloschizopera | | 0 | 117 | 0 | 0 | 0 | 0 | 0 | 356 | **473** | **2** |
| IM-0OQ1J8 | Arthropoda | Copepoda | Harpacticoida | Rhizotrichidae | Rhizothrix | minuta | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | **24** | **1** |
| IM-D06QML | Chaetognatha | Sagittoidea | | | | | 44 | 0 | 67 | 97 | 207 | 17 | 0 | 0 | **432** | **5** |
| IM-D06QML | Chaetognatha | Sagittoidea | | | | | 44 | 0 | 67 | 97 | 207 | 17 | 0 | 0 | **432** | **5** |
| IM-7WH2GP | Chaetognatha | Sagittoidea | | | | | 0 | 0 | 0 | 29 | 17 | 0 | 0 | 0 | **46** | **2** |
| IM-0W9L8F | Cnidaria | Hydrozoa | Anthoathecata | Bougainvilliidae | Bougainvillia | | 0 | 0 | 0 | 19 | 0 | 48 | 0 | 0 | **67** | **2** |
| IM-193TYA | Cnidaria | Hydrozoa | Leptothecata | Eirenidae | Helgicirrha | cari | 0 | 0 | 0 | 4746 | 0 | 0 | 0 | 0 | **4746** | **1** |
| IM-0J53KS | Cnidaria | Hydrozoa | Leptothecata | Melicertidae | Melicertum | octocostatum | 0 | 0 | 0 | 24 | 68 | 0 | 0 | 0 | **92** | **2** |
| IM-0UE8FO | Echinodermata | Echinoidea | Echinolampadacea | Fibulariidae | Echinocyamus | pusillus | 0 | 35920 | 0 | 0 | 0 | 20 | 0 | 0 | **35940** | **2** |
| IM-5T8N02 | Echinodermata | Echinoidea | Spatangoida | Brissidae | Brissopsis | lyrifera | 0 | 0 | 756 | 0 | 38 | 0 | 0 | 0 | **794** | **2** |
| IM-WT088E | Echinodermata | Ophiuroidea | Amphilepidida | Amphiuridae | Amphiura | filiformis | 30845 | 3449 | 0 | 0 | 0 | 683 | 0 | 0 | **34977** | **3** |
| IM-V5KXR1 | Mollusca | Bivalvia | Cardiida | Semelidae | Abra | prismatica | 0 | 0 | 33 | 0 | 0 | 0 | 0 | 0 | **33** | **1** |
| IM-Q15Q30 | Mollusca | Bivalvia | Nuculida | Nuculidae | Nucula | nucleus | 0 | 0 | 0 | 0 | 0 | 127 | 0 | 0 | **127** | **1** |
| IM-XKS4Z5 | Mollusca | Bivalvia | Venerida | Arcticidae | *Arctica* | *islandica* | 0 | 0 | 0 | 0 | 83 | 0 | 0 | 0 | **83** | **1** |
| IM-7D4LWM | Mollusca | Gastropoda | Littorinimorpha | Naticidae | *Euspira* | *nitida* | 0 | 104 | 0 | 0 | 0 | 0 | 0 | 0 | **104** | **1** |
| IM-I55NUH | Mollusca | Gastropoda | | Pyramidellidae | *Turbonilla* | | 23 | 67 | 28 | 0 | 35 | 82 | 42 | 558 | **835** | **7** |
| IM-34LI74 | Mollusca | Gastropoda | | Pyramidellidae | *Turbonilla* | | 0 | 45 | 0 | 0 | 0 | 45 | 43 | 0 | **133** | **3** |
| IM-7R6Y2F | Nematoda | Chromadorea | Monhysterida | Linhomoeidae | *Terschellingia* | *longicaudata* | 0 | 0 | 0 | 0 | 66 | 0 | 0 | 0 | **66** | **1** |
| IM-1YVZ1Z | Nemertea | Palaeonemertea | Archinemertea | Cephalothricidae | | | 0 | 0 | 0 | 0 | 0 | 0 | 43 | 0 | **43** | **1** |
| IM-J55QJV | Platyhelminthes | Platyhelminthes | | Haplopharyngidae | | | 0 | 38 | 0 | 0 | 0 | 0 | 0 | 0 | **38** | **1** |
| IM-M4R8W4 | Rotifera | Eurotatoria | Ploima | Synchaetidae | *Synchaeta* | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 118 | **118** | **1** |
| | | | | | | **Number of Reads** | **35158** | **41553** | **55291** | **23673** | **2509** | **10117** | **2275** | **2645** | **173221** | **82** |
| | | | | | | **Number of OTUs** | **6** | **9** | **10** | **7** | **12** | **17** | **11** | **10** | **49** | **49** |

# APPENDIX L DNA ANALYSIS

| NMSeqID | Phylum | Class | Order | Family | Genus | Species | Samples | | | | | | | | Stations | | | | | | | Total number of reads | Present at number of samples (out of 14) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | ENV04 Surface | ENV13 Bottom | ENV17 Bottom | ENV26 Bottom | ENV29 Bottom | ENV31 Bottom | ENV53 Bottom | ENV53 Surface | ENV04 | ENV13 | ENV17 | ENV26 | ENV29 | ENV31 | ENV53 | | |
| IM-H6683F | Chordata | Teleostei | Clupeiformes | Clupeidae | *Clupea* | *harengus* | 0 | 5322 | 0 | 57548 | 0 | 4563 | 0 | 0 | 0 | 5322 | 0 | 57548 | 0 | 4563 | 0 | **67433** | **3** |
| IM-25HY87 | Chordata | Teleostei | Clupeiformes | Clupeidae | *Sprattus* | *sprattus* | 54284 | 19709 | 30814 | 17729 | 42848 | 25579 | 0 | 0 | 54284 | 19709 | 30814 | 17729 | 42848 | 25579 | 0 | **190963** | **6** |
| IM-566W4J | Chordata | Teleostei | Gadiformes | Gadidae | *Gadus* | *morhua* | 0 | 0 | 0 | 28 | 20 | 2065 | 0 | 37 | 0 | 0 | 0 | 28 | 20 | 2065 | 37 | **2150** | **4** |
| IM-75I6XD | Chordata | Teleostei | Gadiformes | Gadidae | *Melanogrammus* | *aeglefinus* | 68644 | 8005 | 1992 | 726 | 2665 | 12857 | 208 | 3894 | 68644 | 8005 | 1992 | 726 | 2665 | 12857 | 4102 | **98991** | **8** |
| IM-Y439L8 | Chordata | Teleostei | Gadiformes | Gadidae | *Merlangius* | *merlangus* | 0 | 0 | 120 | 41 | 163 | 4733 | 0 | 0 | 0 | 0 | 120 | 41 | 163 | 4733 | 0 | **5057** | **4** |
| IM-A3326P | Chordata | Teleostei | Gadiformes | Gadidae | *Trisopterus* | *esmarkii* | 0 | 43 | 0 | 321 | 0 | 3620 | 0 | 0 | 0 | 43 | 0 | 321 | 0 | 3620 | 0 | **3984** | **3** |
| IM-N0ZB2N | Chordata | Teleostei | Gadiformes | Gadidae | *Trisopterus* | *minutus* | 0 | 0 | 0 | 0 | 0 | 4159 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4159 | 0 | **4159** | **1** |
| IM-3N1A04 | Chordata | Teleostei | Argentiniformes | Argentinidae | | | 0 | 0 | 0 | 0 | 0 | 625 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 625 | 0 | **625** | **1** |
| IM-2Y9H72 | Chordata | Teleostei | Perciformes | Ammodytidae | | | 0 | 15250 | 38316 | 17225 | 0 | 18135 | 27592 | 3735 | 0 | 15250 | 38316 | 17225 | 0 | 18135 | 31327 | **120253** | **6** |
| IM-6FSK1Z | Chordata | Teleostei | Blenniiformes | Blenniidae | *Lipophrys* | *pholis* | 0 | 0 | 0 | 0 | 0 | 0 | 1376 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1376 | **1376** | **1** |
| IM-5W871B | Chordata | Teleostei | Callionymiformes | Callionymidae | *Callionymus* | *lyra* | 0 | 0 | 126 | 89 | 0 | 0 | 0 | 22 | 0 | 0 | 126 | 89 | 0 | 0 | 22 | **237** | **3** |
| IM-AP0738 | Chordata | Teleostei | Callionymiformes | Callionymidae | *Callionymus* | *maculatus* | 0 | 0 | 0 | 0 | 0 | 616 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 616 | 0 | **616** | **1** |
| IM-99O9E1 | Chordata | Teleostei | Gobiiformes | Gobiidae | *Crystallogobius* | *linearis* | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | **22** | **1** |
| IM-PX5MQ9 | Chordata | Teleostei | Gobiiformes | Gobiidae | *Pomatoschistus* | *minutus* | 0 | 0 | 0 | 1191 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1191 | 0 | 0 | 0 | **1191** | **1** |
| IM-X8JMR5 | Chordata | Teleostei | Perciformes | Pholidae | *Pholis* | *gunnellus* | 0 | 0 | 0 | 0 | 3160 | 4677 | 1105 | 1102 | 0 | 0 | 0 | 0 | 3160 | 4677 | 2207 | **10044** | **4** |
| IM-LR6159 | Chordata | Teleostei | Scombriformes | Scombridae | *Scomber* | *scombrus* | 0 | 0 | 0 | 827 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 827 | 0 | 0 | 0 | **827** | **1** |
| IM-GN7780 | Chordata | Teleostei | Pleuronectiformes | Pleuronectidae | *Hippoglossoides* | *platessoides* | 0 | 37067 | 6825 | 1534 | 8791 | 7490 | 224 | 347 | 0 | 37067 | 6825 | 1534 | 8791 | 7490 | 571 | **62278** | **7** |
| IM-671BU9 | Chordata | Teleostei | Pleuronectiformes | Pleuronectidae | *Limanda* | *limanda* | 0 | 10141 | 16775 | 3810 | 2795 | 21382 | 3501 | 18909 | 0 | 10141 | 16775 | 3810 | 2795 | 21382 | 22410 | **77313** | **7** |
| IM-9Z4J32 | Chordata | Teleostei | Pleuronectiformes | Pleuronectidae | *Microstomus* | *kitt* | 0 | 0 | 0 | 169 | 6344 | 6904 | 0 | 0 | 0 | 0 | 0 | 169 | 6344 | 6904 | 0 | **13417** | **3** |
| IM-9V81P6 | Chordata | Teleostei | Pleuronectiformes | Pleuronectidae | *Platichthys* | *flesus* | 0 | 1105 | 3092 | 117 | 637 | 0 | 620 | 1150 | 0 | 1105 | 3092 | 117 | 637 | 0 | 1770 | **6721** | **6** |
| IM-3F88Y4 | Chordata | Teleostei | Pleuronectiformes | Pleuronectidae | *Pleuronectes* | *platessa* | 0 | 3325 | 16916 | 1284 | 6372 | 0 | 16212 | 19894 | 0 | 3325 | 16916 | 1284 | 6372 | 0 | 36106 | **64003** | **6** |
| IM-1Y06L1 | Chordata | Teleostei | Pleuronectiformes | Scophthalmidae | *Zeugopterus* | *punctatus* | 0 | 0 | 10075 | 0 | 0 | 0 | 7402 | 0 | 0 | 0 | 10075 | 0 | 0 | 0 | 7402 | **17477** | **2** |
| IM-00RM06 | Chordata | Teleostei | Salmoniformes | Salmonidae | *Salmo* | *trutta* | 0 | 0 | 0 | 0 | 0 | 0 | 1667 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1667 | **1667** | **1** |
| IM-9KCBK3 | Chordata | Teleostei | Perciformes | Agonidae | *Agonus* | *cataphractus* | 0 | 0 | 0 | 0 | 0 | 0 | 5358 | 25314 | 0 | 0 | 0 | 0 | 0 | 0 | 30672 | **30672** | **2** |
| IM-BJK85A | Chordata | Teleostei | Perciformes | Cottidae | Micrenophrys | lilljeborgii | 0 | 0 | 0 | 0 | 0 | 0 | 15537 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15537 | **15537** | **1** |
| IM-684P2D | Chordata | Teleostei | Perciformes | Cottidae | Myoxocephalus | scorpius | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7944 | 0 | 0 | 0 | 0 | 0 | 0 | 7944 | **7944** | **1** |
| IM-6FHX32 | Chordata | Teleostei | Perciformes | Cottidae | Taurulus | bubalis | 0 | 0 | 0 | 0 | 0 | 0 | 30889 | 20683 | 0 | 0 | 0 | 0 | 0 | 0 | 51572 | **51572** | **2** |
| IM-T2L528 | Chordata | Teleostei | Perciformes | Cyclopteridae | Cyclopterus | lumpus | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3224 | 0 | 0 | 0 | 0 | 0 | 0 | 3224 | **3224** | **1** |
| IM-SQ5312 | Chordata | Teleostei | Perciformes | Liparidae | Liparis | montagui | 0 | 0 | 0 | 0 | 0 | 0 | 58 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 58 | **58** | **1** |
| IM-7OH057 | Chordata | Teleostei | Perciformes | Triglidae | | | 0 | 2277 | 0 | 0 | 11354 | 0 | 0 | 0 | 0 | 2277 | 0 | 0 | 11354 | 0 | 0 | **13631** | **2** |
| | | | | | | **Number of Reads** | **122928** | **102266** | **125051** | **102639** | **85149** | **117405** | **111749** | **106255** | **122928** | **102266** | **125051** | **102639** | **85149** | **117405** | **218004** | **873442** | **90** |
| | | | | | | **Number of OTUs** | **2** | **11** | **10** | **15** | **11** | **14** | **14** | **13** | **2** | **11** | **10** | **15** | **11** | **14** | **18** | **30** | **30** |

# APPENDIX L DNA ANALYSIS

| NMSeqID | Phylum | Class | Order | Family | Genus | Species | Samples | | | | | | | | | | | | | | | | Stations | | | | | | | | Total number of reads | Present at number of samples (out of 52) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | ECR_ENV_04 Bottom | ECR_ENV_04 Surface | ECR_ENV_13 Bottom | ECR_ENV_13 Surface | ECR_ENV_17 Bottom | ECR_ENV_17 Surface | ECR_ENV_26 Bottom | ECR_ENV_26 Surface | ECR_ENV_29 Bottom | ECR_ENV_29 Surface | ECR_ENV_31 Bottom | ECR_ENV_31 Surface | ECR_ENV_36 Bottom | ECR_ENV_36 Surface | ECR_ENV_53 Bottom | ECR_ENV_53 Surface | ENV04 | ENV13 | ENV17 | ENV26 | ENV29 | ENV31 | ENV36 | ENV53 | | |
| IM-6M6ZY5 | Chordata | Teleostei | Clupeiformes | Alosidae | *Sardina* | *pilchardus* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | **16** | **1** |
| IM-86PMO8 | Chordata | Teleostei | Clupeiformes | Clupeidae | | | 375 | 118 | 1013 | 271 | 495 | 227 | 2168 | 81 | 75 | 1062 | 169 | 285 | 2443 | 461 | 76 | 38 | 493 | 1284 | 722 | 2249 | 1137 | 454 | 2904 | 114 | **9357** | **16** |
| IM-861BTZ | Chordata | Teleostei | Cypriniformes | Cyprinidae | *Phoxinus* | *phoxinus* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | **13** | **1** |
| IM-141L6C | Chordata | Teleostei | Gadiformes | Gadidae | *Raniceps* | *raninus* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | **24** | **1** |
| IM-W8EF51 | Chordata | Teleostei | Gadiformes | Gadidae | *Trisopterus* | *esmarkii* | 47 | 0 | 487 | 128 | 363 | 0 | 350 | 0 | 109 | 95 | 504 | 0 | 1308 | 0 | 0 | 0 | 47 | 615 | 363 | 350 | 204 | 504 | 1308 | 0 | **3391** | **9** |
| IM-KVD304 | Chordata | Teleostei | Gadiformes | Gadidae | *Trisopterus* | *minutus* | 0 | 0 | 0 | 0 | 294 | 0 | 0 | 0 | 98 | 0 | 519 | 0 | 102 | 0 | 86 | 39 | 0 | 0 | 294 | 0 | 98 | 519 | 102 | 125 | **1138** | **6** |
| IM-35MW28 | Chordata | Teleostei | Gadiformes | Gadidae | | | 1015 | 15879 | 1278 | 441 | 2139 | 1090 | 564 | 117 | 958 | 478 | 2068 | 1300 | 4244 | 888 | 3739 | 1245 | 16894 | 1719 | 3229 | 681 | 1436 | 3368 | 5132 | 4984 | **37443** | **16** |
| IM-OP488T | Chordata | Teleostei | Gadiformes | Lotidae | *Ciliata* | *mustela* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 44 | 0 | 0 | 1221 | 590 | 0 | 0 | 0 | 0 | 0 | 44 | 0 | 1811 | **1855** | **3** |
| IM-9Y9I7L | Chordata | Teleostei | Gadiformes | Lotidae | *Enchelyopus* | *cimbrius* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 65 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 65 | **65** | **1** |
| IM-X0134T | Chordata | Teleostei | Perciformes | Gasterosteidae | *Gasterosteus* | *aculeatus* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 75 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 75 | **75** | **1** |
| IM-KC7E6H | Chordata | Teleostei | Argentiniformes | Argentinidae | *Argentina* | *sphyraena* | 0 | 0 | 47 | 0 | 59 | 0 | 24 | 0 | 0 | 0 | 181 | 0 | 136 | 0 | 0 | | 0 | 47 | 59 | 24 | 0 | 181 | 136 | 0 | **447** | **5** |
| IM-SOU344 | Chordata | Teleostei | Perciformes | Ammodytidae | *Ammodytes* | | 50616 | 0 | 467 | 625 | 5036 | 1045 | 1237 | 286 | 1641 | 2271 | 203 | 1811 | 100 | 3410 | 5928 | 1504 | 50616 | 1092 | 6081 | 1523 | 3912 | 2014 | 3510 | 7432 | **76180** | **15** |
| IM-6A4A64 | Chordata | Teleostei | Perciformes | Ammodytidae | *Gymnammodytes* | *semisquamatus* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 109 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 109 | **109** | **1** |
| IM-3L8DJ1 | Chordata | Teleostei | Blenniiformes | Blenniidae | *Lipophrys* | *pholis* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 177 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 177 | **177** | **1** |
| IM-CJC655 | Chordata | Teleostei | Callionymiformes | Callionymidae | *Callionymus* | *lyra* | 0 | 0 | 68 | 69 | 0 | 0 | 51 | 0 | 0 | 0 | 32 | 0 | 49 | 0 | 27 | 18 | 0 | 137 | 0 | 51 | 0 | 32 | 49 | 45 | **314** | **7** |
| IM-DT827L | Chordata | Teleostei | Callionymiformes | Callionymidae | *Callionymus* | | 0 | 0 | 0 | 0 | 75 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 75 | 0 | 0 | 0 | 0 | 0 | **75** | **1** |
| IM-7CW88I | Chordata | Teleostei | Gobiiformes | Gobiidae | *Pomatoschistus* | | 0 | 0 | 0 | 0 | 0 | 0 | 26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 26 | 0 | 0 | 0 | 0 | **26** | **1** |
| IM-7967GF | Chordata | Teleostei | Eupercaria incertae sed | Labridae | *Labrus* | *mixtus* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | **25** | **1** |
| IM-5W0Q6F | Chordata | Teleostei | Perciformes | Pholidae | *Pholis* | *gunnellus* | 0 | 0 | 0 | 0 | 49 | 68 | 0 | 0 | 87 | 0 | 0 | 85 | 29 | 0 | 375 | 144 | 0 | 0 | 117 | 0 | 87 | 85 | 29 | 519 | **837** | **7** |
| IM-4ES1Y0 | Chordata | Teleostei | Scombriformes | Scombridae | *Scomber* | *scombrus* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 39 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 39 | 0 | 0 | 0 | **39** | **1** |
| IM-1A652Z | Chordata | Teleostei | Perciformes | Stichaeidae | *Chirolophis* | *ascanii* | 0 | 0 | 0 | 0 | 0 | 0 | 27 | 0 | 0 | 294 | 0 | 0 | 0 | 13 | 29 | 20 | 0 | 0 | 0 | 27 | 294 | 0 | 13 | 49 | **383** | **5** |
| IM-B9CA30 | Chordata | Teleostei | Perciformes | Zoarcidae | *Zoarces* | *viviparus* | 0 | 0 | 0 | 0 | 0 | 29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 29 | 0 | 0 | 0 | 0 | 0 | **29** | **1** |
| IM-33YQ7B | Chordata | Teleostei | Pleuronectiformes | Pleuronectidae | *Hippoglossoides* | *platessoides* | 0 | 0 | 158 | 37 | 330 | 70 | 69 | 0 | 308 | 0 | 85 | 134 | 0 | 292 | 0 | 0 | 0 | 195 | 400 | 69 | 308 | 219 | 292 | 0 | **1483** | **9** |
| IM-9X37KI | Chordata | Teleostei | Pleuronectiformes | Pleuronectidae | *Limanda* | *limanda* | 0 | 1679 | 103 | 29 | 65 | 226 | 46 | 24 | 0 | 95 | 0 | 55 | 115 | 0 | 98 | 93 | 1679 | 132 | 291 | 70 | 95 | 55 | 115 | 191 | **2628** | **12** |
| IM-43C8IX | Chordata | Teleostei | Pleuronectiformes | Pleuronectidae | *Microstomus* | *kitt* | 0 | 0 | 92 | 68 | 0 | 95 | 51 | 0 | 0 | 0 | 171 | 0 | 626 | 0 | 0 | 43 | 0 | 160 | 95 | 51 | 0 | 171 | 626 | 43 | **1146** | **7** |
| IM-8PW24U | Chordata | Teleostei | Pleuronectiformes | Pleuronectidae | | | 162 | 1180 | 416 | 104 | 3232 | 1027 | 512 | 1965 | 922 | 1077 | 480 | 525 | 801 | 378 | 3121 | 1736 | 1342 | 520 | 4259 | 2477 | 1999 | 1005 | 1179 | 4857 | **17638** | **16** |
| IM-BRP44X | Chordata | Teleostei | Pleuronectiformes | Scophthalmidae | *Phrynorhombus* | *norvegicus* | 0 | 0 | 0 | 36045 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 66 | | 0 | 36045 | 0 | 0 | 0 | 21 | 0 | 66 | **36132** | **3** |
| IM-WV7K83 | Chordata | Teleostei | Pleuronectiformes | Soleidae | *Solea* | *solea* | 0 | 0 | 0 | 0 | 59 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 59 | 0 | 0 | 0 | 0 | 0 | **59** | **1** |
| IM-M196Y0 | Chordata | Teleostei | Salmoniformes | Salmonidae | *Oncorhynchus* | *mykiss* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | **16** | **1** |
| IM-W753ST | Chordata | Teleostei | Perciformes | Agonidae | *Agonus* | *cataphractus* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 131 | 0 | 0 | 234 | 0 | 0 | 0 | 0 | 0 | 0 | 131 | 234 | **365** | **2** |
| IM-UT1761 | Chordata | Teleostei | Perciformes | Agonidae | *Agonus* | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22 | 0 | **22** | **1** |
| IM-X61K69 | Chordata | Teleostei | Perciformes | Cottidae | *Micrenophrys* | *lilljeborgii* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2276 | 49 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2325 | **2325** | **2** |
| IM-2Q9OD0 | Chordata | Teleostei | Perciformes | Cottidae | | | 0 | 0 | 0 | 0 | 80 | 76 | 27 | 0 | 0 | 0 | 0 | 0 | 64 | 98 | 678 | 324 | 0 | 0 | 156 | 27 | 0 | 0 | 162 | 1002 | **1347** | **7** |
| IM-56XF9X | Chordata | Teleostei | Perciformes | Cyclopteridae | *Cyclopterus* | *lumpus* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 203 | 82 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 285 | **285** | **2** |
| IM-0ESVO0 | Chordata | Teleostei | Perciformes | Liparidae | *Liparis* | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 75 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 75 | **75** | **1** |
| IM-2Y1M3B | Chordata | Teleostei | Perciformes | Triglidae | | | 81 | 0 | 0 | 0 | 0 | 46 | 0 | 0 | 0 | 0 | 46 | 36 | 518 | 0 | 0 | 46 | 81 | 0 | 46 | 0 | 0 | 82 | 518 | 46 | **773** | **6** |
| IM-M5596K | Chordata | Teleostei | Syngnathiformes | Syngnathidae | *Entelurus* | *aequoreus* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | **16** | **1** |
| IM-43PD9V | Chordata | Teleostei | Syngnathiformes | Syngnathidae | *Syngnathus* | *rostellatus* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | **30** | **1** |
| IM-877UM2 | Chordata | Amphibia | Caudata | Phocidae | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 37 | 0 | 0 | 0 | 217 | 35 | 0 | 0 | 0 | 0 | 0 | 37 | 0 | 252 | **289** | **3** |
| IM-I50B1N | Chordata | Aves | Anseriformes | Delphinidae | *Grampus* | *griseus* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | 0 | 0 | **23** | **1** |
| IM-P2068J | Chordata | Aves | Anseriformes | Delphinidae | *Tursiops* | *truncatus* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | **13** | **1** |
| IM-7XW7B5 | Chordata | Aves | Charadriiformes | Phocoenidae | *Phocoena* | *phocoena* | 0 | 0 | 207 | 264 | 170 | 0 | 34 | 0 | 64 | 96 | 117 | 32 | 0 | 188 | 673 | 636 | 0 | 471 | 170 | 34 | 160 | 149 | 188 | 1309 | **2481** | **11** |
| IM-7N0TE4 | Chordata | Aves | Charadriiformes | Alcidae | Alca | torda | 0 | 0 | 0 | 0 | 0 | 31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 27 | 27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **3** |
| IM-J518Y3 | Chordata | Aves | Charadriiformes | Laridae | | | 0 | 0 | 0 | 953 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6804 | 162 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **3** |
| IM-K76VZ2 | Chordata | Aves | Columbiformes | Columbidae | Columba | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 59 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| IM-352H4W | Chordata | Aves | Columbiformes | Columbidae | | | 0 | 0 | 0 | 0 | 0 | 49 | 87 | 0 | 0 | 0 | 0 | 0 | 0 | 210 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **3** |
| IM-72PW6S | Chordata | Mammalia | Carnivora | Phocidae | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 37 | 0 | 0 | 0 | 217 | 35 | 0 | 0 | 0 | 0 | 0 | 37 | 0 | 252 | **289** | **3** |
| IM-IH9XC4 | Chordata | Mammalia | Cetartiodactyla | Delphinidae | Grampus | griseus | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | 0 | 0 | **23** | **0** |
| IM-4F36YH | Chordata | Mammalia | Cetartiodactyla | Delphinidae | Tursiops | truncatus | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | **13** | **1** |
| IM-IJ2L15 | Chordata | Mammalia | Cetartiodactyla | Phocoenidae | Phocoena | phocoena | 0 | 0 | 207 | 264 | 170 | 0 | 34 | 0 | 64 | 96 | 117 | 32 | 0 | 188 | 673 | 636 | 0 | 471 | 170 | 34 | 160 | 149 | 188 | 1309 | **2481** | **11** |
| | | | | | | **Number of Reads** | **52296** | **18856** | **4543** | **39298** | **12616** | **4079** | **5307** | **2473** | **4326** | **5603** | **4812** | **4360** | **10688** | **6185** | **27065** | **7872** | **71152** | **42888** | **16615** | **7693** | **9929** | **9172** | **16604** | **27917** | **201970** | **214** |
| | | | | | | **Number of OTUs** | **6** | **4** | **12** | **13** | **15** | **13** | **16** | **5** | **10** | **10** | **17** | **12** | **15** | **11** | **26** | **30** | **7** | **13** | **18** | **15** | **13** | **21** | **19** | **35** | **46** | **49** |

# APPENDIX M MACROFAUNA ANALYSIS

# APPENDIX M MACROFAUNA ANALYSIS

| Aphia ID | Phylum Class/Order | Taxon Name | Qualifiers | Authority | Stations | | |

Gardline

# APPENDIX M MACROFAUNA ANALYSIS

| Aphia ID | Phylum Class/Order | Taxon Name | Qualifiers | Authority | Stations | | |

Gardline

# APPENDIX M MACROFAUNA ANALYSIS

| Aphia ID | Phylum Class/Order | Taxon Name | Qualifiers | Authority | Stations | | |

Gardline

# APPENDIX M MACROFAUNA ANALYSIS

| Aphia ID | Phylum Class/Order | Taxon Name | Qualifiers | Authority | Stations | | |

# APPENDIX M MACROFAUNA ANALYSIS

| Aphia ID | Phylum Class/Order | Taxon Name | Qualifiers | Authority | Stations | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ENV01 | ENV02 | ENV03 | ENV04 | ENV05 | ENV06 | ENV07 | ENV08 | ENV09 | ENV10 | ENV11 | ENV12 | ENV13 | ENV14 | ENV15 | ENV16 | ENV17 | ENV18 | ENV19 | ENV20 | ENV21 | ENV22 | ENV23 | ENV24 | ENV25 | ENV26 | ENV27 | ENV28 | ENV29 | ENV30 | ENV31 | ENV33 | ENV34 | ENV35 | ENV36 | ENV53 | ENV57 | ENV58 | ENV59 | |
| 2 | | ANIMALIA | Eggs | | | | | | | | | | | | | | | | | | | | | | | | P | | | | | | | | | | | | | | | | | P |
| | **BRYOZOA** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 110829 | **Gymnolaemata** | *Schizomavella* | | Canu & Bassler, 1917 | | | | | | | | | | | | | | | | | | | | P | | | | | | | | | | | | | | | | | | | | P |
| 111367 | | *Flustra foliacea* | | (Linnaeus, 1758) | | | | | | | | | | | | | | | | | | | | P | | | | | | | | | | | | | | | | | | | | P |
| 110965 | | *Escharella* | | Gray, 1848 | | | | | | | | | | | | | | | | | | | | P | | | | | | | | | | | | | | | | | | | | P |
| 110724 | **Stenolaemata** | CYCLOSTOMATIDA | | Busk, 1852 | | | | | | | | | | | | | | | | | | | | P | | | | | | | | | | | | | | | | | | | | P |
| | **CNIDARIA** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13551 | **Hydrozoa** | ANTHOATHECATA | | Cornelius, 1992 | | | P | | | P | | | | | | | P | | | | | | | | | | P | | | P | P | | | P | | | | | | | | | P |
| 13552 | | LEPTOTHECATA | | Cornelius, 1992 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | P | | P |
| 1605 | | Aglaopheniidae | | Marktanner-Turneretscher, 1890 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | P | | | | | P |
| 117103 | | *Halecium* | | Oken, 1815 | | | | | | | | | | | | | | | | | | | | P | | | | | | | | | | | | | | | | | | | | P |
| | **CILIOPHORA** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1692 | **Heterotrichea** | Folliculinidae | | Dons, 1914 | | | | | | | | | | | | | | | | P | | | | | | | | | | | | | | | | | | | | | P | | | P |
| | **HEMICHORDATA** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1820 | **Enteropneusta** | ENTEROPNEUSTA | | Gegenbaur, 1870 | | | | P | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | P |
| | **NEMERTEA** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 152391 | | NEMERTEA | | | | | | | | | | | | | | | | | | | | | P | | | | | | P | | | | | P | | | | | | | | | P |
| | **NEMATODA** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 799 | | NEMATODA | | | | P | P | | | | | | | P | P | | | | | | P | | P | P | | | | | | | | | | | | | | | | | | | P |
| | **PHORONIDA** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 128545 | | *Phoronis* | | Wright, 1856 | P | | | | | | | | | | | P | | | | | | | | | P | P | | P | | P | | | | | | | | | | | | | P |
| | **ALGAE** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | ENCRUSTING ALGAE | | | | | | | | | | | | | | | | | | | | | | P | | | | | | | | | | | | | | | | | | | P |

Juvenile Record
Combined Adult and Juvenile Record
Taxa in blue are the top ten most dominant in the adult data set
Taxa in red are species of interest

# APPENDIX N BIOMASS ANALYSIS

# APPENDIX N BIOMASS ANALYSIS

| Aphia ID | Phylum Class/Order | Taxon Name | Qualifiers | Authority | Stations | | |

# APPENDIX N BIOMASS ANALYSIS

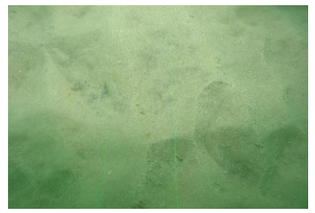
| Aphia ID | Phylum Class/Order | Taxon Name | Qualifiers | Authority | Stations | | |

# APPENDIX N BIOMASS ANALYSIS

| Aphia ID | Phylum Class/Order | Taxon Name | Qualifiers | Authority | Stations | | |

# APPENDIX O EUNIS CLASSIFICATION

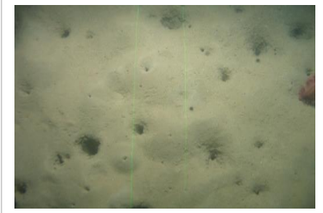
# APPENDIX O EUNIS CLASSIFICATION

| Adult Station Multivariate Cluster | Station | Water Depth (m) | Zone | Broad Substrate | Detailed Substrate Description | Salinity | EUNIS Level 2 | EUNIS Habitat Classification | | MNCR Habitat Classification | | EUNIS/MNCR Habitat Type | Top Ten Fauna Abundance | | | Remarks | Representative Image |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Level | Code | Level | Code | | Rank | Taxa | Abundance | | |
| *a* | ENV57<br>ENV58 | 13<br>20 | Infralittoral | Sand | Sand and muddy sand | Full | MB5 | 5 | MB5233 | 4 | SS.SSa.IFiSa.NcirBat | Nephtys cirrosa and Bathyporeia spp. in Atlantic infralittoral sand | 1 | *Nephtys cirrosa* | 10 | Fauna is dominated by polychaetes and arthropods in sands and muddy sands in shallow water to at least 30m depth. |  |
| | | | | | | | | | | | | | 2 | *Magelona johnstoni* | 8 | | |
| | | | | | | | | | | | | | 3 | *Bathyporeia guilliamsoniana* | 5 | | |
| | | | | | | | | | | | | | 3 | *Spiophanes bombyx* | 6 | | |
| | | | | | | | | | | | | | 4 | *Bathyporeia elegans* | 2 | | |
| | | | | | | | | | | | | | 4 | ***Euspira nitida*** | 2 | | |
| | | | | | | | | | | | | | 5 | *Magelona filiformis* | 5 | | |
| | | | | | | | | | | | | | 6 | Phoronis | 2 | | |
| | | | | | | | | | | | | | 7 | *Glycinde nordmanni* | 1 | | |
| | | | | | | | | | | | | | 7 | *Spiophanes* | 1 | | |
| | | | | | | | | | | | | | 7 | *Magelona alleni* | 1 | | |
| | | | | | | | | | | | | | 7 | *Megaluropus agilis* | 1 | | |
| | | | | | | | | | | | | | 7 | ***Echinocyamus pusillus*** | 1 | | |
| | | | | | | | | | | | | | 7 | *Gari fervensis* | 1 | | |
| | | | | | | | | | | | | | 7 | Tellinidae | 1 | | |
| | | | | | | | | | | | | | 7 | Veneridae | 1 | | |
| | | | | | | | | | | | | | 8 | *Spio* | 1 | | |
| | | | | | | | | | | | | | 8 | *Donax vittatus* | 1 | | |
| *b* | ENV20 | 32 | Infralittoral | NA | NA | Full | MC4 | 4 | MC421 | 3 | SS.SMx.CMx | Faunal communities of Atlantic circalittoral mixed sediment | 1 | *Scalibregma inflatum* | 6 | Fauna is dominated by epifaunal molluscs in shallow mixed sediment |  |
| | | | | | | | | | | | | | 2 | ***Echinocyamus pusillus*** | 5 | | |
| | | | | | | | | | | | | | 3 | *Galathea intermedia* | 4 | | |
| | | | | | | | | | | | | | 3 | *Amphipholis squamata* | 4 | | |
| | | | | | | | | | | | | | 3 | *Tritia* | 4 | | |
| | | | | | | | | | | | | | 4 | *Hydroides norvegica* | 3 | | |
| | | | | | | | | | | | | | 4 | *Leptochiton asellus* | 3 | | |
| | | | | | | | | | | | | | 4 | Onchidorididae | 3 | | |
| | | | | | | | | | | | | | 4 | Anomiidae | 3 | | |
| | | | | | | | | | | | | | 4 | *Callipallene* | 3 | | |
| | | | | | | | | | | | | | 5 | *Harmothoe* | 2 | | |
| | | | | | | | | | | | | | 5 | *Aonides paucibranchiata* | 2 | | |
| | | | | | | | | | | | | | 5 | Serpulidae | 2 | | |
| | | | | | | | | | | | | | 5 | *Gammaropsis maculata* | 2 | | |
| | | | | | | | | | | | | | 5 | *Anapagurus hyndmanni* | 2 | | |
| | | | | | | | | | | | | | 5 | *Asterias rubens* | 2 | | |
| | | | | | | | | | | | | | 5 | SIPUNCULA | 2 | | |
| | | | | | | | | | | | | | 5 | **NEMERTEA** | 2 | | |
| | | | | | | | | | | | | | 6 | Polynoidae | 1 | | |
| | | | | | | | | | | | | | 6 | *Glycera lapidum* | 1 | | |
| | | | | | | | | | | | | | 6 | *Mediomastus fragilis* | 1 | | |
| | | | | | | | | | | | | | 6 | *Spio armata* | 1 | | |
| | | | | | | | | | | | | | 6 | *Cirratulus* | 1 | | |
| | | | | | | | | | | | | | 6 | *Spirobranchus triqueter* | 1 | | |
| | | | | | | | | | | | | | 6 | *Iphimedia spatula* | 1 | | |
| | | | | | | | | | | | | | 6 | *Nototropis vedlomensis* | 1 | | |
| | | | | | | | | | | | | | 6 | *Ampelisca spinipes* | 1 | | |
| | | | | | | | | | | | | | 6 | *Urothoe marina* | 1 | | |
| | | | | | | | | | | | | | 6 | *Pseudoprotella phasma* | 1 | | |
| | | | | | | | | | | | | | 6 | *Anthura gracilis* | 1 | | |
| | | | | | | | | | | | | | 6 | *Galathea nexa* | 1 | | |
| | | | | | | | | | | | | | 6 | *Pisidia longicornis* | 1 | | |
| | | | | | | | | | | | | | 6 | *Amphiura (Ophiopeltis) securigera* | 1 | | |
| | | | | | | | | | | | | | 6 | GASTROPODA | 1 | | |
| | | | | | | | | | | | | | 6 | ***Euspira nitida*** | 1 | | |
| | | | | | | | | | | | | | 6 | *Tritia incrassata* | 1 | | |
| | | | | | | | | | | | | | 6 | *Parvicardium pinnulatum* | 1 | | |
| | | | | | | | | | | | | | 6 | *Clausinella fasciata* | 1 | | |
| | | | | | | | | | | | | | 6 | *Venus casina* | 1 | | |

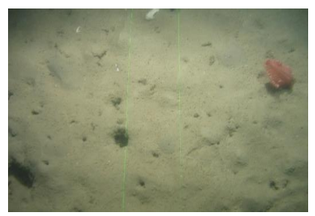
# APPENDIX O EUNIS CLASSIFICATION

| Adult Station Multivariate Cluster | Station | Water Depth (m) | Zone | Broad Substrate | Detailed Substrate Description | Salinity | EUNIS Level 2 | EUNIS Habitat Classification | | MNCR Habitat Classification | | EUNIS/MNCR Habitat Type | Top Ten Fauna Abundance | | | Remarks | Representative Image |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Level | Code | Level | Code | | Rank | Taxa | Abundance | | |
| *c* | ENV07<br>ENV59 | 32<br>29 | Circalittoral | Sand | Sand and muddy sand | Full | MC5 | 4 | MC521 | 3 | SS.SSa.CMuSa | Faunal communities of Atlantic circalittoral sand | 1 | ***Echinocyamus pusillus*** | 15 | Fauna is dominated by polychaetes, athropods and bivalves in shallow sand. |  |
| | | | | | | | | | | | | | 2 | *Asbjornsenia pygmaea* | 7 | | |
| | | | | | | | | | | | | | 3 | *Ophelia borealis* | 3 | | |
| | | | | | | | | | | | | | 3 | **NEMERTEA** | 3 | | |
| | | | | | | | | | | | | | 4 | *Edwardsia claparedii* | 2 | | |
| | | | | | | | | | | | | | 5 | *Urothoe marina* | 6 | | |
| | | | | | | | | | | | | | 5 | ***Scoloplos armiger*** | 1 | | |
| | | | | | | | | | | | | | 5 | *Spiophanes bombyx* | 1 | | |
| | | | | | | | | | | | | | 5 | *Polycirrus* | 1 | | |
| | | | | | | | | | | | | | 5 | ***Euspira nitida*** | 1 | | |
| | | | | | | | | | | | | | 5 | *Dosinia lupinus* | 1 | | |
| | | | | | | | | | | | | | 6 | *Pista lornesis* | 3 | | |
| | | | | | | | | | | | | | 7 | *Orbinia* | 2 | | |
| | | | | | | | | | | | | | 7 | *Dosinia* | 2 | | |
| | | | | | | | | | | | | | 8 | Polynoidae | 1 | | |
| | | | | | | | | | | | | | 8 | *Glycera lapidum* | 1 | | |
| | | | | | | | | | | | | | 8 | *Glycinde nordmanni* | 1 | | |
| | | | | | | | | | | | | | 8 | *Eteone* | 1 | | |
| | | | | | | | | | | | | | 8 | *Nephtys longosetosa* | 1 | | |
| | | | | | | | | | | | | | 8 | *Aponuphis bilineata* | 1 | | |
| | | | | | | | | | | | | | 8 | *Aonides paucibranchiata* | 1 | | |
| | | | | | | | | | | | | | 8 | *Scolelepis* | 1 | | |
| | | | | | | | | | | | | | 8 | *Leptochiton asellus* | 1 | | |
| | | | | | | | | | | | | | 8 | PLATYHELMINTHES | 1 | | |
| *d* | ENV01<br>ENV15<br>ENV16<br>ENV21<br>ENV53 | 35<br>52<br>40<br>48<br>31 | Offshore circalittoral | Gravelly sand | Muddy sand to coarse and mixed sediment | Full | MD4 | 4 | MD421 | 3 | SS.SMx.CMx | Faunal communities of Atlantic circalittoral mixed sediment | 1 | THRACIOIDEA | 19 | Fauna is dominated by polychaetes in coarse and mixed sediment. |  |
| | | | | | | | | | | | | | 2 | ***Owenia*** | 8 | | |
| | | | | | | | | | | | | | 2 | *Lumbrineris aniara agg.* | 8 | | |
| | | | | | | | | | | | | | 3 | *Magelona alleni* | 8 | | |
| | | | | | | | | | | | | | 3 | ***Urothoe elegans*** | 17 | | |
| | | | | | | | | | | | | | 4 | *Edwardsia claparedii* | 12 | | |
| | | | | | | | | | | | | | 5 | ***Scoloplos armiger*** | 14 | | |
| | | | | | | | | | | | | | 5 | *Aphelochaeta* | 6 | | |
| | | | | | | | | | | | | | 6 | *Aponuphis bilineata* | 11 | | |
| | | | | | | | | | | | | | 7 | ***Echinocyamus pusillus*** | 17 | | |
| | | | | | | | | | | | | | 7 | **NEMERTEA** | 9 | | |
| | | | | | | | | | | | | | 8 | *Kurtiella bidentata* | 10 | | |
| | | | | | | | | | | | | | 9 | *Polycirrus* | 4 | | |
| | | | | | | | | | | | | | 9 | *Phaxas pellucidus* | 5 | | |
| | | | | | | | | | | | | | 10 | ***Peresiella clymenoides*** | 4 | | |
| | | | | | | | | | | | | | 10 | ***Amphiura filiformis*** | 8 | | |

# APPENDIX O EUNIS CLASSIFICATION

| Adult Station Multivariate Cluster | Station | Water Depth (m) | Zone | Broad Substrate | Detailed Substrate Description | Salinity | EUNIS Level 2 | EUNIS Habitat Classification | | MNCR Habitat Classification | | EUNIS/MNCR Habitat Type | Top Ten Fauna Abundance | | | Remarks | Representative Image |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Level | Code | Level | Code | | Rank | Taxa | Abundance | | |
| *e* | ENV26<br>ENV27 | 110<br>90 | Offshore circalittoral | Sand | Mud and sandy mud | Full | MD6 | 4 | MD621 | 3 | SS.SMu.Omu | Faunal communities on Atlantic offshore circalittoral mud | 1 | *Heteromastus filiformis* | 12 | Fauna is dominated by polychaetes and bivalves in sandy mud. |  |
| | | | | | | | | | | | | | 2 | ***Peresiella clymenoides*** | 4 | | |
| | | | | | | | | | | | | | 2 | *Eudorella emarginata* | 4 | | |
| | | | | | | | | | | | | | 3 | *Glycera unicornis* | 3 | | |
| | | | | | | | | | | | | | 4 | *Notomastus* | 2 | | |
| | | | | | | | | | | | | | 4 | ***Galathowenia*** | 2 | | |
| | | | | | | | | | | | | | 4 | ***Callianassa subterranea*** | 2 | | |
| | | | | | | | | | | | | | 4 | *Scutopus ventrolineatus* | 2 | | |
| | | | | | | | | | | | | | 4 | *Abra nitida* | 2 | | |
| | | | | | | | | | | | | | 5 | *Nucula sulcata* | 4 | | |
| | | | | | | | | | | | | | 6 | *Harpinia pectinata* | 4 | | |
| | | | | | | | | | | | | | 6 | *Amphiura chiajei* | 4 | | |
| | | | | | | | | | | | | | 6 | *Tellimya ferruginosa* | 3 | | |
| | | | | | | | | | | | | | 7 | *Praxillura longissima* | 2 | | |
| | | | | | | | | | | | | | 7 | ***Urothoe elegans*** | 2 | | |
| | | | | | | | | | | | | | 7 | *Ampelisca tenuicornis* | 2 | | |
| | | | | | | | | | | | | | 8 | *Pholoe pallida* | 1 | | |
| | | | | | | | | | | | | | 8 | *Oxydromus flexuosus* | 1 | | |
| | | | | | | | | | | | | | 8 | *Prionospio cf. dubia* | 1 | | |
| | | | | | | | | | | | | | 8 | *Diplocirrus glaucus* | 1 | | |
| | | | | | | | | | | | | | 8 | *Tryphosites longipes* | 1 | | |
| | | | | | | | | | | | | | 8 | *Cylichna cylindracea* | 1 | | |
| | | | | | | | | | | | | | 8 | ***Papillicardium minimum*** | 1 | | |
| | | | | | | | | | | | | | 8 | *Abyssoninoe hibernica* | 1 | | |
| | | | | | | | | | | | | | 8 | *Iphinoe serrata* | 1 | | |
| | | | | | | | | | | | | | 8 | *Brissopsis lyrifera* | 1 | | |
| | | | | | | | MC6 | 5 | MC6216 | 4 | SS.SMu.CFiMu.SpnMeg | Seapens and burrowing megafauna in Atlantic circalittoral fine mud | | | | Classification including imagery interpretation | |
| *f* | ENV02<br>ENV04<br>ENV09<br>ENV12<br>ENV24 | 88<br>83<br>87<br>90<br>92 | Offshore circalittoral | Sand | Mud and sandy mud | Full | MD6 | 4 | MD621 | 3 | SS.SMu.Omu | Faunal communities on Atlantic offshore circalittoral mud | 1 | *Amphictene auricoma* | 23 | Fauna is dominated by polychaetes and bivalves in sandy mud. |  |
| | | | | | | | | | | | | | 1 | ***Peresiella clymenoides*** | 22 | | |
| | | | | | | | | | | | | | 2 | ***Callianassa subterranea*** | 16 | | |
| | | | | | | | | | | | | | 3 | ***Amphiura filiformis*** | 15 | | |
| | | | | | | | | | | | | | 4 | ***Galathowenia*** | 14 | | |
| | | | | | | | | | | | | | 5 | *Harpinia antennaria* | 8 | | |
| | | | | | | | | | | | | | 6 | **NEMERTEA** | 8 | | |
| | | | | | | | | | | | | | 7 | ***Papillicardium minimum*** | 12 | | |
| | | | | | | | | | | | | | 7 | *Varicorbula gibba* | 3 | | |
| | | | | | | | | | | | | | 8 | *Amphiura chiajei* | 7 | | |
| | | | | | | | | | | | | | 8 | *Leptosynapta bergensis* | 3 | | |
| | | | | | | | | | | | | | 9 | *Trichobranchus roseus* | 3 | | |
| | | | | | | | | | | | | | 10 | ***Owenia*** | 5 | | |
| | | | | | | | | | | | | | 10 | *Glycera unicornis* | 4 | | |
| | | | | | | | MC6 | 5 | MC6216 | 4 | SS.SMu.CFiMu.SpnMeg | Seapens and burrowing megafauna in Atlantic circalittoral fine mud | | | | Classification including imagery interpretation | |

# APPENDIX O EUNIS CLASSIFICATION

| Adult Station Multivariate Cluster | Station | Water Depth (m) | Zone | Broad Substrate | Detailed Substrate Description | Salinity | EUNIS Level 2 | EUNIS Habitat Classification | | MNCR Habitat Classification | | EUNIS/MNCR Habitat Type | Top Ten Fauna Abundance | | | Remarks | Representative Image |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Level | Code | Level | Code | | Rank | Taxa | Abundance | | |
| *g* | ENV10<br>ENV18<br>ENV28<br>ENV29<br>ENV30<br>ENV31<br>ENV34 | 78<br>69<br>78<br>83<br>74<br>76<br>76 | Offshore circalittoral | Sand | Mud and sandy mud to mixed sediment | Full | MD6 | 4 | MD621 | 3 | SS.SMu.Omu | Faunal communities on Atlantic offshore circalittoral mud | 1 | *Prionospio cf. dubia* | 57 | Fauna is dominated by polychaetes in sandy mud. |  |
| | | | | | | | | | | | | | 2 | ***Callianassa subterranea*** | 18 | | |
| | | | | | | | | | | | | | 3 | *Trichobranchus roseus* | 12 | | |
| | | | | | | | | | | | | | 3 | *Chaetozone pseudosetosa* | 17 | | |
| | | | | | | | | | | | | | 4 | *Diplocirrus glaucus* | 17 | | |
| | | | | | | | | | | | | | 5 | *Abra nitida* | 13 | | |
| | | | | | | | | | | | | | 5 | ***Urothoe elegans*** | 11 | | |
| | | | | | | | | | | | | | 6 | **NEMERTEA** | 9 | | |
| | | | | | | | | | | | | | 7 | *Notomastus* | 8 | | |
| | | | | | | | | | | | | | 7 | ***Peresiella clymenoides*** | 12 | | |
| | | | | | | | | | | | | | 8 | *Glycinde nordmanni* | 7 | | |
| | | | | | | | | | | | | | 9 | *Myrtea spinifera* | 14 | | |
| | | | | | | | | | | | | | 10 | *Chaetoderma nitidulum* | 6 | | |
| | | | | | | | | | | | | | 10 | ***Astrorhiza*** | 15 | | |
| | | | | | | | MC6 | 5 | MC6216 | 4 | SS.SMu.CFiMu.SpnMeg | Seapens and burrowing megafauna in Atlantic circalittoral fine mud | | | | Classification including imagery interpretation | |
| *h* | ENV03<br>ENV05<br>ENV14<br>ENV35<br>ENV36 | 74<br>75<br>69<br>78<br>73 | Offshore circalittoral | Sand | Muddy sand to sandy mud | Full | MD6 | 4 | MD621 | 3 | SS.SMu.Omu | Faunal communities on Atlantic offshore circalittoral mud | 1 | ***Astrorhiza*** | 15 | Fauna is dominated by polychaetes and arthropods in sandy mud or muddy sand. |  |
| | | | | | | | | | | | | | 2 | *Phoronis* | 10 | | |
| | | | | | | | | | | | | | 3 | **NEMERTEA** | 8 | | |
| | | | | | | | | | | | | | 4 | ***Galathowenia*** | 14 | | |
| | | | | | | | | | | | | | 5 | ***Euspira nitida*** | 12 | | |
| | | | | | | | | | | | | | 6 | ***Papillicardium minimum*** | 11 | | |
| | | | | | | | | | | | | | 6 | ***Owenia*** | 10 | | |
| | | | | | | | | | | | | | 7 | *Abra* | 6 | | |
| | | | | | | | | | | | | | 7 | *Scoloplos armiger* | 6 | | |
| | | | | | | | | | | | | | 7 | ***Urothoe elegans*** | 7 | | |
| | | | | | | | | | | | | | 8 | ***Callianassa subterranea*** | 5 | | |
| | | | | | | | | | | | | | 9 | *Diplocirrus glaucus* | 7 | | |
| | | | | | | | | | | | | | 10 | ***Amphiura filiformis*** | 8 | | |
| | | | | | | | MC6 | 5 | MC6216 | 4 | SS.SMu.CFiMu.SpnMeg | Seapens and burrowing megafauna in Atlantic circalittoral fine mud | | | | Classification including imagery interpretation | |
| *i* | ENV06<br>ENV08<br>ENV11<br>ENV13<br>ENV17<br>ENV19<br>ENV22<br>ENV23<br>ENV25<br>ENV33 | 71<br>73<br>68<br>63<br>75<br>79<br>64<br>74<br>75<br>92 | Offshore circalittoral | Sand | Sand and muddy sand to coarse sediment | Full | MD5 | 4 | MD521 | 3 | SS.SSa.CMuSa | Faunal communities of Atlantic offshore circalittoral sand | 1 | ***Amphiura filiformis*** | 38 | Fauna is dominated by molluscs and echinoderms in sand and muddy sand. |  |
| | | | | | | | | | | | | | 2 | ***Papillicardium minimum*** | 22 | | |
| | | | | | | | | | | | | | 3 | *Antalis entalis* | 36 | | |
| | | | | | | | | | | | | | 3 | ***Astrorhiza*** | 39 | | |
| | | | | | | | | | | | | | 4 | ***Euspira nitida*** | 15 | | |
| | | | | | | | | | | | | | 5 | ***Echinocyamus pusillus*** | 27 | | |
| | | | | | | | | | | | | | 6 | *Rhodine gracilior* | 14 | | |
| | | | | | | | | | | | | | 7 | Veneridae | 8 | | |
| | | | | | | | | | | | | | 8 | *Phoronis* | 11 | | |
| | | | | | | | | | | | | | 9 | **NEMERTEA** | 8 | | |
| | | | | | | | | | | | | | 10 | *Thyasira flexuosa* | 12 | | |
| | | | | | | | | | | | | | 10 | *Lumbrineris aniara agg.* | 14 | | |
| | | | | | | | | | | | | | 10 | *Edwardsia claparedii* | 6 | | |
| | | | | | | | MC6 | 5 | MC6216 | 4 | SS.SMu.CFiMu.SpnMeg | Seapens and burrowing megafauna in Atlantic circalittoral fine mud | | | | Classification including imagery interpretation | |

Taxa in **bold** denotes presence in the top ten when ranked by abundance

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