www.gov.uk/naturalengland

Request for Quotation

Request for Quotation

Littoral sediment survey of the Duddon Estuary SSSI – WFA pilot

You are invited, to submit a quotation for the requirement described in the specification below.

Please confirm, by email, receipt of these documents and whether you intend to submit a quote.

Your response should be returned to the following email address by:

Email: Integrated.monitoring@naturalengland.org.uk
Date: 06/09/2023
Time: 9am

Ensure you state the Duddon Estuary ‘Final Submission’ in the subject field to make it clear that it is your response.

Contact Details and Timeline

Beth Mather will be your contact for any questions linked to the content of the quote pack or the process. Please submit any questions by email and note that, unless commercially sensitive, both the question and the response will be circulated to all tenderers.

Action	Date
Date of issue of RFQ	23/08/2022
Deadline for receipt of Quotation	06/09/2022
Intended date of Contract Award	08/09/2022
Intended date of inception meeting	08/09/2022
Intended Contract Start Date	08/09/2022
Contract Duration	5 months
Draft Report to be submitted to project officer	02/02/2023 (negotiable)
Draft Report to be Submitted to Contractor with Natural England Comments	14/02/2023
Final Report delivery date	28/02/2023

Glossary

Unless the context otherwise requires the following words and expressions used within this Request for Quotation shall have the following meanings (to be interpreted in the singular or plural as the context requires):

“Authority”	Means the Department for Environment, Food and Rural Affairs acting as part of Natural England
“RFQ”	Means this Request for Quotation and all related documents published by the Authority and made available to suppliers
“Contract”	Means the contract to be entered into by the Authority and the successful supplier.

Conditions applying to the RFQ

You should examine your response to the RFQ and related documents ensuring it is complete prior to submitting your completed quotation.

Your quotation must contain sufficient information to enable the Authority to evaluate it fairly and effectively. You should ensure that you have prepared your quotation fully and accurately and that prices quoted are arithmetically correct for the units stated.

The supplier by submitting a quotation is deemed to accept the terms and conditions in the RFQ. Failure to comply with the instructions set out in the RfQ may result in the supplier's exclusion from this procurement.

Acceptance of Quotations

By issuing this RFQ the Authority does not bind itself to accept any quotation and reserves the right not to award a contract to any supplier who submits a quotation.

Costs

The Authority will not reimburse you for any costs and expenses which you incur preparing and submitting your quotation, even if the Authority amends or terminates the procurement process.

Mandatory Requirements

The RFQ includes mandatory requirements and, if you do not comply with them, your quotation will not be evaluated.

Clarifications

The Authority reserves the right to discuss, confidentially, any aspect of your quotation with you prior to any award of Contract to clarify matters.

Amendments

The Authority may amend the RFQ at any time prior to the deadline for receipt. If it amends the RFQ the Authority will notify you in writing and may extend the deadline for receipt in order to give you a reasonable time in which to take the amendment into account.

Conditions of Contract

The terms and conditions attached here will be included in any contract awarded as a result of this RFQ process. The Authority will not accept any material changes to these terms and conditions proposed by a supplier.

Specification

The Authority is Natural England. The Authority's priorities are to secure a healthy natural environment; a sustainable, low-carbon economy; a thriving farming sector and a sustainable, healthy and secure food supply. Further information about the Authority can be found at: Natural England

1.Introduction

This document is the technical specification covering Littoral sediment, analysis and reporting, principally for Intertidal mudflats and sandflats (Mudflats and sandflats not covered by seawater at low tide) - Special Areas of Conservation (jncc.gov.uk),

Please note – this contract has tight deadlines and fieldwork will need to be undertaken in September 2022 with the final report submitted by 28/02/2023.

The Duddon Estuary is formed by the River Duddon and the smaller Kirkby Pool opening into the Irish Sea at the south-west corner of the Lake District. The mouth of the estuary forms an extensive flat sand plain, with the sands being very mobile. The mid and upper reaches of the estuary are flanked by saltmarsh and beyond high water are extensive sand dunes on both the north and south sides of the mouth of the estuary. These sand dune systems are particularly important for a diverse range of community types, supporting a number of rare and uncommon plants, as well as a variety of nationally rare and scarce invertebrate species. The past activities of the mining and iron-making industries have created a number of artificial habitats which have become areas of wildlife interest. These include the slag banks of Askham Pier and Borwick Rails, and the largest coastal lagoon in north-west England at Hodbarrow Lagoon. The Duddon Estuary is of international and national importance for wintering wildfowl and waders and provides a vital link in the chain of west coast estuaries used by migrating birds, as well as being of particular importance as one of a series of estuaries on the north-west coast where the majority of the British population of Natterjack Toads occur.

Littoral sediment is a key feature of the Duddon Estuary SSSI and is located in units 1-4 (please see appendix 1). The littoral sediment covers an area of 4,320 ha.

Mudflats and Sandflats not covered by seawater at low tide within the Duddon Estuary SSSI and under Annex 1 of the EU Habitats Directive are the primary (but not exclusive) focus for work under this contract.

Work under this contract must be located within the designated site, and the geographical scope of work undertaken will be within England.

The broad scale distribution of the main habitats relevant to this contract within the Duddon Estuary Site of Special Scientific Interest, are available on the MAGIC website. http://magic.defra.gov.uk/MagicMap.aspx

The contract supports the recent pilot surveys in Natural England's move to whole feature assessments. For the purpose of this survey, the littoral sediment feature will be surveyed as a whole with some points made relating to each unit to support management recommendations.

2. Aims

The role of this contract is to acquire high quality ground truth survey data of suitable resolution to provide a sound evidence base to contribute to long term monitoring, and Natural England led condition assessments.

The list below lists the attributes to monitor. Further information can be found here (also in Appendix 2).

- Distribution: presence and spatial distribution of biological communities (identified to the highest EUNIS classification possible i.e. EUNIS level 5 or 6).
- Structure and function: presence and abundance of key structural and influential species
- Structure: non-native species and pathogens
- Structure: sediment composition and distribution

- Structure: sediment total organic carbon content
- Structure: species composition of component communities
- Supporting processes: sediment contaminants (list of contaminant analysis required is provided in Appendix 1).

In addition to the above, measure redox layer depth and interstitial salinity at each infauna sample station.

3. Objectives

A previous intertidal survey on the Duddon Estuary SSSI has been undertaken, although this does not provide detailed information of the littoral sediment. The report may assist with survey design and will be forwarded upon award of the contract.

Objectives of individual surveys under this contract should address all of the following:

3.1. Use relevant guidance (E.g JNCC (2004), Wyn, et al. (2000) and ISO 16665 (2005)) and site-specific information to propose a cost-effective sampling design to enable the monitoring of specific attributes which inform on the ecological condition of '*Mudflats and Sandflats not covered by seawater at low tide*' over time, as outlined above. This will focus on gathering evidence to assess feature condition and anthropogenic change. The monitoring design should therefore aim to assess:

a) Whether the specified attributes have passed or failed against their targets
b) Whether there is or is not a difference in a particular attribute condition over time.
c) Whether any change is driven by anthropogenic activity
d) Whether there is or is not a difference in a particular attribute between otherwise similar communities, and where possible, determine whether the differences are as a result of anthropogenic pressures.

3.2 The sampling strategy should incorporate previous monitoring undertaken within Morecambe Bay SAC. Wherever possible the sampling strategy should take account of and supplement existing data sets obtained by, or available to, Natural England/the contractor. Data should be collected in a way to maximize the compatibility with historical survey data, but at the very least should make reference to and utilise such historical data. The statistically robust survey design should enable future collection of compatible data permitting quantitative long-term analysis.

3.3 Following agreement of the fieldwork protocol with Natural England the contractor will undertake the necessary survey work to meet the overarching aims and objectives.

3.4 Cover interpretation and analyses of raw data including the undertaking of appropriate analyses of specimens. Where previous data exists, temporal analysis should be undertaken to address points (a) to (d) in section 1.1.1 above. Where suitable existing data does not exist the results and analysis should inform the baseline for temporal comparison. Where it is not possible to discriminate between anthropogenic and natural change/variability, recommendations for further investigation/survey should be made.

*Please note: Sample infauna and PSA analysis will be undertaken by a third-party contractor under a separate NE/EA framework. (**Sample analysis is therefore not part of this framework**). As part of this process the contractor is required to complete Environment Agency OCR fieldwork proformas for the samples and is also expected to liaise with the sample contractor and ensure samples are couriered to them for analysis. Samples may need to be stored by the contractor in*

a safe refrigerated facility prior to postage. Natural England will cover the cost of couriering. Please ensure this cost is included in your budget.

3.5 Potential anthropogenic influences within or near the survey site should be identified, mapped, and where possible quantified. Further analysis should (if appropriate) focus on investigation of the potential impacts of these pressures (e.g. bait collection, trampling, trawl marks, dumped or discarded material, gear or nets).

Provide information on macroalgal blooms for WFD by completing the Opportunistic Macroalgal sheet at the back of the 'Assessing opportunistic macroalgal blooms for WFD in transitional and coastal waters' operational instructions.

3.6 Undertake appropriate qualitative and quantitative statistical analyses of data, including univariate and multivariate statistics, to enable the assessment of each attribute target. The quantitative characterisation of benthic communities and a description of the range of shore habitats and associated fauna that exist within the survey area should be provided.

3.7 Where appropriate contractors should validate their sample design/intensity by performing post survey power analysis. For example, species accumulation curves, tests for autocorrelation, power of change detection using diversity indices.

3.8 Evaluate the effectiveness of data collection methods, techniques and technical equipment.

3.9 Provide detailed 'standard operating protocols' for the work undertaken to ensure that these can be repeated as required in the future.

3.10 In light of the data obtained the contractor should provide preliminary advice on the 'condition' of each attribute, i.e. whether the targets have passed or failed, has there been change in the attribute over time and is there any evidence that the feature has been impacted by anthropogenic influences. In each attribute assessment, there should be consideration for any variation across specific geographic areas, notable communities or exposure to environmental or anthropogenic factors.

Natural England will review this evidence when carrying out the overall feature(s) condition assessment in accordance with Natural England guidance which takes account of a number of further considerations.
In addition, the contractor is not obliged to, but is welcome to provide any overriding thoughts on the integrity of the whole feature or particular sub feature, which will be considered by site leads in their condition assessment process.

3.11 Report the detailed findings of the project in succinct and clear final reports, including appropriate GIS outputs, a confidence assessment of the data outputs and standard survey imagery (further detailed in General Requirements of the framework, Appendix 2).

3.2. Detailed Requirements

3.2.1.Development of an appropriate sampling design

Where survey work is being undertaken the successful contractor will need to develop an appropriate sampling design in collaboration with Natural England in order to meet the aims of the project. The full detail of this design will be provided to and owned by Natural England. Contractors will be required to attend an inception meeting prior to undertaking any fieldwork.

The survey design should consider how information to address all the attributes and targets for the features to be surveyed can be obtained. In developing the sampling design, careful consideration should be given to the statistical power that repeat sampling and subsequent analysis will provide.
Survey design needs to be considered in relation to:

i. Enabling comparisons with previous data sets, where available. It should be noted that relevant Standard Operating Practices for previous surveys need to be referred to and utilised, where appropriate, to facilitate comparable time-series data.
ii. Where necessary improving upon previous sampling designs to provide more robust temporal statistical comparisons when repeated in the future.
iii. To test the ability of the monitoring work to distinguish between natural change and anthropogenically driven change within a realistic timescale and budget.

Where previous studies and data sets are available, but may now be viewed as inadequate to deliver the statistically robust ongoing quantitative analysis that Natural England require, the emphasis should be on improving methodologies, whilst having regard for, and making the best use of existing data.

3.2.2. Field survey

Please note, the Duddon Estuary SSSI is also notified for the presence of over wintering birds. Care must be taken during field work so the birds are not disturbed.

Contractors should also comply with recent guidance developed by MESH for mapping and survey techniques: 'Recommended operating guidelines (ROG) for aerial photography' (Piel and Populus, 2008).
Surveys for Littoral Sediment should follow the guidance provided within JNCC's Common Standards Monitoring (CSM) Guidance, and more specifically the section on Littoral Sediment Habitats. Faunal sampling should conform to standard methodology ISO 16665:2014, and identification should be carried out in accordance to the NMBAQC quality control guidelines following Standard Operation Procedure ES-04.

Provision should also be made for the possibility of NE representatives (with appropriate health and safety training and experience) to participate during survey operations.

3.2.3.Data analysis

Natural England expects robust and appropriate statistical analysis to be completed, and the results presented and discussed. An explanation of why certain methods have been chosen should be included, and a justification of any relevant assumptions supplied. GIS should be used to present any geographical information and data gathered or created during the project. Base mapping including OS tiles and aerial photographs can be provided by Natural England under licence if required.
The results should be compared to previous surveys and other relevant papers (including appropriate statistical analysis). Any observed changes should be set into context using other existing information. Where possible, an indication of the condition of the feature/sub-feature should be stated in terms of whether the assessed ecological attributes have passed or failed their target criteria (using Natural England Guidance).
Please refer to Appendix 2 for reporting and analysis standards.

3.2.4.Project deliverables

Please note, the survey window phases mentioned below are for guidance only. The contractor will need to confirm survey window times depending on their own capacity and knowledge of the site/survey.

Task no.	Task and deliverable	Completion date
1	Contract start	08/09/2022
2	Survey window phase 1	Sept/Oct
3	Survey window phase 2	Oct/Nov
4	Draft report received	02/02/2023
5	Final report received	28/02/2023

3.3. Quality Assurance

In undertaking this work contractors should have regard to the following quality assurance steps (e.g. NMBAQC). Contractors should ensure they follow the standards listed in Section 3.2.2. Also please note that reports and data products will be subject to Natural England's internal QA process before final sign off.

4. GPS data formats

It is important to be able to geolocate the survey effort so that geospatial cross-referencing with other data sources can take place.

The location of all sampling areas should be provided in ten figure 'x' and 'y' co-ordinates format, entered in an Excel spreadsheet. .

Once agreed with Natural England, a map showing the sampling areas should be provided as part of the contract outputs. Indicative mapped routes can be provided as part of the tender process, but it is at the discretion of the contractor.

4.1. Access to land

Natural England will initially obtain landowner/manager permission in advance of the surveys and provide approximate timings of site visits. Land manager contact details will be provided at the start of the contract by Natural England. The contractor will then liaise directly with landowners and occupiers to arrange specific dates and times for access. Permissions must be obtained at least 48 hours prior to monitoring. Any refusals or other issues should be notified to the Natural England project officer within 3 working days.

5. Analysis and Reporting

The outputs, unless agreed otherwise in writing by the Project Officer, will be as detailed in this section.

5.1.Outputs

An Excel spreadsheet should be included showing the six-figure x:y co-ordinates of the sample locations.

Provide maps showing the location of sampling point and provide separate x:y grid references in an excel spreadsheet or provide locations in a GIS file compatible with ArcMap. Indicative mapped routes can be provided as part of the tender process, but it is at the discretion of the contractor.

Reporting and Analysis Standards

Data must be interpreted, analysed and presented in light of the overarching hypotheses stated above. Contractors should pay particular consideration to the data and GIS required formats for information compatibility including MEDIN metadata standards and Marine Recorder provision:

- All sample data (grab sample analyses, video/still photography analyses, diver survey species, PSA analysis and biotope lists etc) need to be entered into Marine Recorder and delivered with the final reports. Natural England will provide licence keys for Marine Recorder to the winning contractors for use in this contract. A Snapshot file of the data should also be provided. https://www.esdm.co.uk/marine-recorder. Guidance 'Marine Recorder Evidence for Contractors' will be provided to the winning contractor.

- All GIS datasets need to be provided in ESRI ArcGIS format compatible with ArcGIS 10.2 and have attached metadata

- All GIS files containing habitat data for each individual survey need to be produced to the MESH translated habitat data exchange format to the most detailed EUNIS habitat level possible. MNCR (v15.03) data should be added to the *ORIG_HAB* column. The GUI provided by Natural England for each survey will be used, and as much information as possible (eg survey name, originally assigned feature/habitat name etc) from the original dataset, as well as any documentation provided (where available) should be included in the resulting datasets to maintain a useful audit trail. Where MESH GUI references are identical, the datasets should be combined and treated as a single survey record. As specified in the MESH data exchange format, data files must be provided as ESRI Shapefiles using geographic coordinates (lat/long) and the WGS84 datum. If the datasets supplied are in other projections, transformation using the appropriate petroleum (EPSG) transformation should be carried out as part of the data formatting procedure.
- If not included in the GIS data layers listed above all sampling locations, vessels tracks, and links to data obtained should also be included as a single GI layer.
- A MESH data confidence assessment for each habitat map should be calculated and provided in a 'MESH confidence scoresheet' excel file. The confidence assessment process is described and a template provided in the MESH resources here.
- Accompanying metadata for the data set must meet the MEDIN metadata discovery standard. Metadata derived as part of this project must be submitted to Natural England in an XML file which Natural England will archive through Data Archive Centres (DACs). Guidance 'MEDIN Guidance for Contractors' will be provided to the winning contractor.

- Copies of the original data spreadsheets or databases are to be provided in the appropriate Microsoft Office format.

- Copies of the original drop down videos are to be provided on DV tape and on indexed DVDs or USB compliant external hard drives. Stills photographs to be provided in their raw format on CD/DVD or USB compliant external hard drives

5.2. Reporting and presentation of data

- A report will be produced to include introduction, methods and results together with maps and photographs showing the locations of sampling areas and recorded species. Please include the photographs in an appendix.

- As described in the data format section above, an Excel spreadsheet should be included showing the ten-figure x:y co-ordinates of the sample locations. This spreadsheet must only contain binomials in the main species column; if more detailed trinomial, sub-specific, or sens lat, sens strictu ascriptions are required then these should be in an “other name” column.

- General description of the habitat should be included, with clear and concise recommendations for management to benefit the habitat.

5.2. Maps

Provide maps showing the location of each survey points and provide separate x:y grid references in an excel spreadsheet or provide locations in a GIS file compatible with ArcMap. Provide maps showing the location of any transects, point counts and survey routes in the report and in a GIS file compatible with ArcMap.

A copy of maps should be provided in jpg or pdf format and as GIS layers, in or compatible with ESRI ArcGIS format. Information and guidance on requesting baseline digital geographical data from Natural England can be found on our website at Geographical Information for contractors and partners.

6. Health & Safety / Known Hazards

Risks associated with field-based work need to be considered. The Health and Safety at Work Act 1974 is to be fully complied with at all times.
Please provide a clear and structured proposal to demonstrate your intended approach to health and safety on this project and how you ensure the requirements of legislation are met.

The risk assessment must also include a section on Covid-19

If Covid-19 advice changes and affect the work as part of this contract, the successful contractor must inform the project manager within two working days and provide an updated risk assessment within five working days.

The risk assessment must also include a section on Avian influenza which covers assurance that contractors will work within the latest government guidance on Avian influenza.

Your quotation for the work should be accompanied by the following Health and Safety documentation required by Natural England:

- Risk assessment: this must take the hazards identified above into account.
- Valid certificates (if appropriate) to be made available on request:
- Employers Liability Compulsory Insurance
- Public Liability Insurance –provide description of level taken out
- Professional Indemnity Insurance –provide description of level taken out

Work shall not commence without Natural England being in possession of appropriate documentation and an agreed safe method of working.

Prices

i. Prices must be submitted in £ sterling, inclusive of VAT. Please provide quotation for both one and two visit scenarios.
ii. Please price against the work described in this specification and annexes and complete the pricing template in Annex 3.
iii. The tenderer should demonstrate how they will cover the survey area and how the visits will be organised in terms of personnel and timescales.
iv. Day rates and numbers of days for key staff should be provided. Costs should be broken down to show the time allocated to each part of the project. Please itemise other costs including material / equipment costs. Please detail any assumptions made when pricing for any aspects of this tender.

It is anticipated that this contract will be awarded for a period of 5 months to end no later than 28/02/2023. Prices will remain fixed for the duration of the contract award period. We may at our sole discretion extend this contract to include related or further work. Any extension shall be agreed in advance of any work commencing and may be subject to further competition.

Suppliers should email invoices to APinvoices-NEG-U@gov.sscl.com or post them to:

Shared Services Connected Limited
Natural England
PO Box 793
Newport
NP10 8FZ

Please ensure that the Purchase Order number is included on the invoice.

Quotation Submission

i. Pricing Template (Annex 3)
ii. Your proposal outlining how you will meet Natural England's Requirements.
iii. Methodology including a proposed outline schedule or timetable of works, including a rationale for the estimate of the number of days required for field survey work, how you

will cover the survey area, and how the visits will be organised in terms of personnel and timescales.
iv. Insurance certificates.
v. Health and Safety Policy.
vi. Risk Assessment including that for Coronavirus.
vii. Acceptance of terms and conditions.

We will award this contract in line with the most economically advantageous tender (MEAT) as set out in the following award criteria:

Evaluation Criteria

The contract will be awarded to the tender which best fits the profile of requirements. This will be assessed by the Project Officer in consultation with relevant colleagues using the evaluation criteria detailed below.

As part of the evaluation process a quality threshold will be placed on each scoring criterion identified below. If your tender falls below the threshold then your bid will not be considered.

Your tender should include the following information and supporting evidence. Your tender should include the following information and supporting evidence.

Evaluation Criteria	Weighting (%)	Threshold score out of 10	Tender Information

Technical expertise and experience – Please provide details of your experience in undertaking: • Littoral sediment surveys using the methods outlined in this specification. • Experience of Site Condition Monitoring on SSSI sites. Please provide details of your experience in: • Littoral sediment surveys generally. • Analysis, presentation and reporting of data generated from surveys.	30	8	Previous contracts for undertaking littoral sediment surveys for site evaluations and Site Condition Monitoring on SSSI sites. Qualifications, technical merit and experience of key staff engaged on the contract e.g. CVs, previous survey / contracts, technical qualifications. Particular reference should be made to experience of littoral sediment surveying of the previously mentioned habitat. .
Proposed Staff (inc Pen Portraits) and Contractor's experience/accreditations.	15	7	Qualifications, technical merit and experience of key staff engaged on the contract e.g. CVs, previous littoral sediment survey / contracts, technical qualifications. CVs for all staff should be submitted to support the response and include a table showing the staff days expected to be spent on the project per task, this table should match the staff days in the cost proposal. Please provide details of the team structure that you intend to use to deliver this project, including any sub-contractors.
Project and risk management, and resources allocated – Please provide full details as requested under Tender Information	15	6	Include details of availability given the timescales and a proposed outline schedule or timetable of works. Details of personnel, support systems, organisational and management skills to deliver all aspects of the requirement in full. This must include an assessment of the risks to project delivery and mitigation (including contingency in the event of delays), evidence of quality control measures and project management procedures.
Financial (value for money)	30	No threshold	Include all costs and VAT clearly itemised.
Health & Safety	N/A	7	Please provide a clear and structured proposal to demonstrate your intended approach to health and safety on this project and how you ensure the requirements of legislation are met.
Sustainability	10	6	The Authority has set itself challenging commitments and targets to improve the environmental economic and social impacts of its estate management, operation, and procurement. These support the Government's green commitments. The policies are included in the Authority's sustainable procurement policy statement published at:

			https://www.gov.uk/government/publications/defra-s-sustainable-procurement-policy-statement Within this context, please briefly explain your approach to delivering the services and how you intend to reduce negative sustainability impacts. Please discuss the methods that you will employ to demonstrate and monitor the effectiveness of your organization's approach for this requirement

The scoring criteria are listed in Annex 4.

Contract Management

This contract shall be managed on behalf of the Authority by:

Beth Mather
Lead Adviser: SSSI Monitoring
Email: Integrated.monitoring@naturalengland.org.uk

Natural England will raise purchase orders to cover the cost of the services and will issue to the awarded supplier following contract award.

Suppliers will be required to invoice after each contract milestone. An invoice schedule will be agreed after the contract is awarded.

Fortnightly updates during the first month then monthly updates thereafter, an e-mail summary of work progress should be sent to the project officer monthly.

Disclosure

All Central Government Departments, their Executive Agencies and Non-Departmental Public Bodies are subject to control and reporting within Government. In particular, they report to the Cabinet Office and HM Treasury for all expenditure. Further the Cabinet Office has a cross-Government role delivering overall Government policy on public procurement, including ensuring value for money and related aspects of good procurement practice.

For these purposes, the Authority may disclose within Government any details contained in your quotation. The information will not be disclosed outside Government during the procurement.

In addition, the Authority is subject to the Freedom of Information Act 2000 and the Environmental Information Regulations 2004, which provide a public right of access to information held by public bodies. In accordance with these two statutes, the Authority may be required to disclose information contained in your quotation to any person who submits a request for information pursuant to those statutes.

By submitting a quotation you consent to these terms as part of the procurement.

Disclaimers

Whilst the information in this RFQ and any supporting information referred to herein or provided to you by the Authority have been prepared in good faith the Authority does not warrant that this information is comprehensive or that it has been independently verified.

The Authority does not:

- make any representation or warranty (express or implied) as to the accuracy, reasonableness or completeness of the RFQ;

- accept any liability for the information contained in the RFQ or for the fairness, accuracy or completeness of that information; or

- accept any liability for any loss or damage (other than in respect of fraudulent misrepresentation or any other liability which cannot lawfully be excluded) arising as a result of reliance on such information or any subsequent communication.

Any supplier considering entering into contractual relationships with the Authority following receipt of the RFQ should make its own investigations and independent assessment of the Authority and its requirements for the goods and/or services and should seek its own professional financial and legal advice.

Protection of Personal Data

In order to comply with the General Data Protection Regulations 2018 the contractor must agree to the following:

- You must only process any personal data in strict accordance with instructions from the Authority
- You must ensure that all the personal data that we disclose to you or you collect on our behalf under this agreement are kept confidential.
- You must take reasonable steps to ensure the reliability of employees who have access to personal data.
- Only employees who may be required to assist in meeting the obligations under this agreement may have access to the personal data.
- Any disclosure of personal data must be made in confidence and extend only so far as that which is specifically necessary for the purposes of this agreement.
- You must ensure that there are appropriate security measures in place to safeguard against any unauthorised access or unlawful processing or accidental loss, destruction or damage or disclosure of the personal data.
- On termination of this agreement, for whatever reason, the personal data must be returned to us promptly and safely, together with all copies in your possession or control.

General Data Protection Regulations 2018

For the purposes of the Regulations the Authority is the data processor.

The personal information that we have asked you provide on individuals (data subjects) that will be working for you on this contract will be used in compiling the tender list and in assessing your offer. If you are unsuccessful the information will be **held and destroyed within two years** of the award of contracts. If you are awarded a contract it will be retained for the duration of the contract and destroyed within **seven years** of the contract's expiry.

We may monitor the performance of the individuals during the execution of the contract, and the results of our monitoring, together with the information that you have provided, will be used in determining what work is allocated under the contract, and in any renewal of the contract or in the award of future contracts of a similar nature. The information will not be disclosed to anyone outside the Authority without the consent of the data subject, unless the Authority is required by law to make such disclosures.

References

- Anderson, S. S. 1972. The Ecology of Morecambe Bay. II. Intertidal Invertebrates and Factors Affecting Their Distribution. Journal of Applied Ecology, 9, 161-178.

- APEM. 2015. Improvement Programme for England's Natura 2000 Sites (IPENS) – Planning for the Future IPENS022 Ribble Estuary SSSI / Ribble & Alt SPA Intertidal sediments condition monitoring: APEM.

- Bhatia, N., Mazik, K., Thomson, S. and Smith, T. 2013. North West Condition Assessment of Intertidal Mud and Sand Features: Institute of Estuarine and Coastal Studies University of Hull (IECS),.
- Camacho-Ibar, V. F., Wrench, J. J. and Head, P. C. 1992. Contrasting behaviour of arsenic and mercury in Liverpool Bay sediments. Estuarine, Coastal and Shelf Science, 34, 23-36.

- Centre for Environment, F. a. A. S. C. 2014. Radioactivity in Food and the Environment, 2014 - RIFE- 20
- Common Standards Monitoring Guidance for Littoral Sediment Habitats

- Covey, R., Pirie, C., Clifton, S. and Jenner, L. 2016 Typical Species - achieving the benefits while avoiding the pitfalls

- Department for Environment, F. a. R. A. D. 2000. Quality Status Report of the Marine and Coastal Areas of the Irish Sea and Bristol Channel: Department for Environment, Food and Rural Affairs (Defra).
- DONG Energy. 2013. Volume 1: Environmental Statement. Chapter 8: Sediment and Water Quality.
- Duddon FCT.pdf

- English Nature. 1997. Morecambe Bay littoral monitoring: English Nature.

- Environment Agency Marine Monitoring Service. 2014. TraC Winter Dissolved Inorganic Nitrogen tool-level classifications (at water body level, aggregated to MPA). Peterborough: Environment Agency.
- Guidance for Common Standards Monitoring (CSM)

- Guidelines for quantitative sampling and sample processing of marine soft-bottom macrofauna
- Gray, J. and Elliott, M. 2009. Ecology of Marine Sediments:From Science to Management, Second Edition, Oxford Biology.

- Herbert, R. J. H., Roberts, C., J., H. and S., F. 2012. The Pacific Oyster (Crassostrea gigas) in the UK: Economic, legal and environmental issues associated with its cultivation, wild establishment and exploitation: Centre for Conservation Ecology and Environmental Science, ABP Marine Environmental Research Ltd, Jhc Research, Plymouth University.

- ISO 16665: (2005). Water quality – Guidelines for quantitative sampling and sample processing of marine soft bottom macrofauna.

- Joint Nature Conservation Committee (JNCC). 2004. Common Standards Monitoring Guidance for Littoral Sediment Habitats Peterborough: Joint Nature Conservation Committee (JNCC).
- Joint Nature Conservation Committee (JNCC). 2004. Marine Advice: Non-Native Species [Online]. JNCC. [Accessed 10/03/2015].

- Marine Monitoring Handbook (2001)

- Morecambe Bay SAC Supplementary Advice

- NMBAQC quality control guidelines following Standard Operation Procedure ES-04

- North Western Inshore Fisheries and Conservation Authority. 2016. Dredging of seed mussel from north Morecambe Bay Assessment of Likely Significant Effect.

- OSPAR Commission. 2012. Co-ordinated Environmental Monitoring Programme (CEMP) 2011 Assessment Report.: OSPAR.

- Recommended operating guidelines (ROG) for aerial photography

- Royal Haskoning. 2006. Maritime Monitoring Intertidal Survey of North West England 2005-2006: Royal Haskoning,.

- Royal Haskoning. 2006. Intertidal survey of Morecambe Bay and the Duddon Estuary

- Rostron, D. 1992. Sublittoral benthic sediment communities of Morecambe Bay. Report 47: Joint Nature Conservation Committee.

- Viaroli, P., Bartoli, M., Giordani, G., Magni, P. and Welsh, D. T. 2004. Biogeochemical indicators as tools for assessing sediment quality/vulnerability in transitional aquatic ecosystems. Aquatic Conservation: Marine and Freshwater Ecosystems, 14, S19-S29.

- WA Marine & Environment Ltd. 2010. An Intertidal Survey of the Biotopes of Foulney Island, Morecambe Bay.

- Waser, A. M., Splinter, W. and van der Meer, J. C. a. 2015. Indirect effects of invasive species affecting the population structure of an ecosystem engineer. Ecosphere, 6, 1-1

- WYN, G., BRAZIER, P., JONES, M., ROBERTS, S., COOKE, A., LOUGH, N. & UTTLEY, C. (2000). CCW Handbook for Marine Littoral Phase 1 Survey and Mapping, 107 pp. Marine Science Report No. 00/06/01, February 2000, Countryside Council for Wales, UK. DAVIES, J., BAXTER, J., BRADLEY, M., CONNOR, D., KHAN, J., MURRAY, E., SANDERSON, W., TURNBULL, C. & VINCENT, M., (2001), Marine Monitoring Handbook, 40 pp, ISBN 1 85716 550 0

Annexes

Annex 1: Map showing survey area
Annex 2: Features to be monitored.
Annex 3: Pricing Template
Annex 4: Scoring Criteria

Appendix 1: Units 1-4 of the Duddon Estuary SSSI (highlighted in blue)

Appendix 2
Features to be monitored

Feature/sub feature name	Attribute	Target	Supporting Notes	Site Specific Info
Intertidal sand and muddy sand	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of intertidal sand and muddy sand communities.	A variety of communities make up the habitat. Listed component communities reflect the habitat's overall character and conservation interest. Communities are described as biotopes using EUNIS or the Marine Habitat Classification. Communities include, but are not limited to, those that are notable or representative of the feature. Representative communities include, for example, those covering large areas and notable communities include those that are rare, scarce or particularly sensitive to pressure. Changes to the spatial distribution of communities across the feature could highlight changes to the overall feature (Joint Nature Conservation Committee (JNCC), 2004).	Higher shore areas are typically muddy sand biotopes containing polychaetes and/ or amphipods, such as EUNIS code habitats A2.241 (*Macoma balthica* and Arenicola marina in muddy sand shores) and A2.243 (*Hediste diversicolor*, *Macoma balthica* and *Eteone longa* in littoral muddy sand) and, occasionally, A2.244 (*Bathyporeia pilosa* and *Corophium arenarium* in littoral muddy sand.) (Bhatia et al., 2013)
Intertidal mud	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of intertidal mud communities	A variety of communities make up the habitat. Listed component communities reflect the habitat's overall character and conservation interest. Communities are described as biotopes using EUNIS or the Marine Habitat Classification. Communities include, but are not	Higher shore areas are typically muddy sand biotopes containing polychaetes and / or amphipods, such as EUNIS code habitats A2.241 (*Macoma balthica* and Arenicola marina in muddy sand shores) and A2.243 (*Hediste diversicolor*, *Macoma balthica* and *Eteone longa* in littoral muddy sand) and occasionally A2.244 (*Bathyporeia pilosa* and *Corophium arenarium* in littoral muddy sand) (Bhatia et al., 2013).

		according to the map.	limited to, those that are notable or representative of the feature. Representative communities include, for example, those covering large areas and notable communities include those that are rare, scarce or particularly sensitive to pressure. Changes to the spatial distribution of communities across the feature could highlight changes to the overall feature (Joint Nature Conservation Committee (JNCC), 2004).	
Mudflats and sandflats not covered by seawater at low tide	Distribution: presence and spatial distribution of biological communities	Maintain the presence and spatial distribution of mudflat and sandflat communities.	A variety of communities make up the habitat. Listed component communities reflect the habitat's overall character and conservation interest. Communities are described as biotopes using EUNIS or the Marine Habitat Classification. Communities include, but are not limited to, those that are notable or representative of the feature. Representative communities include, for example, those covering large areas and notable communities include those that are rare, scarce or particularly sensitive to pressure. Changes to the spatial distribution of communities across the feature, could highlight changes to the overall feature (Joint Nature Conservation Committee (JNCC), 2004).	The intertidal sediment feature of Morecambe Bay SAC tends to follow a consistent zonation pattern between the upper and the lower shore. Upper shore muddy sands around the bay exist as either expansive flats, or narrow, relatively steeper sections with mixed sediments. These areas are characterised by amphipods such as *Bathyporeia* and *Corophium* species, the lug worm (*Arenicola marina*), the baltic tellin (*Macoma balthica*), and the spire shell (*Peringia ulvae),* which can all occur in high densities. Habitats include EUNIS A2.241 (*Macoma balthica* and *Arenicola marina* in muddy sand shores), EUNIS A2.243 (*Hediste diversicolor*, *Macoma balthica* and *Eteone longa* in littoral muddy sand) and A2.244 (*Bathyporeia pilosa* and *Corophium* in littoral muddy sand) (Bhatia et al., 2013). The mid and low shore consisted of medium to very fine sand and typically lack a diverse or abundant infaunal community. Where species are observed, these tend to include *Arenicola marina* and the thin tellin *Angulus tenuis*. Habitats include A2.23 Polychaete/amphipod-dominated fine sand shores and A2.231 (Polychaetes in littoral fine sand) (Bhatia et al., 2013). The common cockle *Cerastoderma edule* can be found in the bay as part of the habitat A2.242 (*Cerastoderma edul*e and polychaetes in littoral muddy sand) (Bhatia et al., 2013). This habitat is important to the SAC and Morecambe Bay and Duddon Estuary SPA as a prey resource for birds but it can be highly variable in distribution with significant variations in cockle density from year to year. Ephemeral and relatively short lived settlements (sometimes forming beds) of the mussel *Mytilus edulis* occur on sediment in the bay, particularly on mixed sediments or sandy sediments with shell fragments. These

				settlements of mussel can be highly variable in distribution but are generally observed in the northern part of the bay (Bhatia et al., 2013).
Intertidal sand and muddy sand	Structure and function: presence and abundance of key structural and influential species	[Maintain OR Recover OR Restore] the abundance of listed species*, to enable each of them to be a viable component of the habitat.	Natural England has included an attribute for the abundance of key structural and influential species for habitat features. Structural species are those that form part of the habitat structure or help to define a key biotope. Influential species are those that are likely to have a key role affecting the structure and function of the habitat (such as bioturbators (mixers of sediment), grazers, surface borers, predators or other species with a significant functional role linked to the habitat). These will be identified at a national level in accordance with the criteria defined in the key structural and influential species paper (Covey et al., 2016). *For each species listed the reason for its inclusion as structural or influential and the information supporting its presence within the community of this site will be provided.	
Intertidal mud	Structure and function: presence and abundance of key structural and influential species	[Maintain OR Recover OR Restore] the abundance of listed species*, to enable each of them to be a viable component of the habitat.	Natural England has included an attribute for the abundance of key structural and influential species for habitat features. Structural species are those that form part of the habitat structure or help to define a key biotope. Influential species are those that are likely to have a key role affecting the structure and function of the habitat (such as bioturbators (mixers of sediment), grazers, surface borers,	

			predators or other species with a significant functional role linked to the habitat). These will be identified at a national level in accordance with the criteria defined in the key structural and influential species paper (Covey et al., 2016). *For each species listed the reason for its inclusion as structural or influential and the information supporting its presence within the community of this site will be provided.	
Mudflats and sandflats not covered by seawater at low tide	Structure and function: presence and abundance of key structural and influential species	[Maintain OR Recover OR Restore] the abundance of listed species*, to enable each of them to be a viable component of the habitat.	Natural England has included an attribute for the abundance of key structural and influential species for habitat features. Structural species are those that form part of the habitat structure or help to define a key biotope. Influential species are those that are likely to have a key role affecting the structure and function of the habitat (such as bioturbators (mixers of sediment), grazers, surface borers, predators or other species with a significant functional role linked to the habitat). These will be identified at a national level in accordance with the criteria defined in the key structural and influential species paper (Covey et al., 2016). *For each species listed the reason for its inclusion as structural or influential and the information supporting its presence within the community of this site will be provided.	

Intertidal sand and muddy sand	Structure: non-native species and pathogens (habitat)	Restrict the introduction and spread of non-native species and pathogens, and their impacts.	Non-native species may become invasive and displace native organisms by preying on them or out-competing them for resources such as food, space or both. In some cases this has led to the loss of indigenous species from certain areas (Joint Nature Conservation Committee (JNCC), 2004). A pathogen causes disease or illness to its host. Pathogens include bacteria, viruses, protozoa and fungi (Biology-Online, 2008).	There have been very few records of non-native or invasive species in the SAC. Morecambe Bay supports a Pacific oyster, *Magallana gigas* (formerly *Crassostrea gigas*) hatchery and trestle farm (Herbert et al., 2012). Mitigation measures and monitoring are part of an adaptive management strategy to prevent the accidental escape of non-native species which may cause ecological community changes (e.g. altering the population structure of *Mytilus edulis* by modifying specific predator-prey interactions (Waser et al., 2015). However, several large, wild specimens of M. gigas have been reported at Foulney Island in 2010 (WA Marine & Environment Ltd., 2010). There have been individual records of Chinese mitten crab, *Eriocheir sinensis*, in the Duddon Estuary; the most recent of which was at Millom Pier in 2012 (North Western Inshore Fisheries and Conservation Authority, 2016). It is not clear if these are indications of persistent populations or sporadic occurrences. Japanese wireweed, *Sargassum muticum*, has been recorded within the SAC in the Walney Channel (Hawes et al., 2015), and in rockpools at North Walney and the Foulney Island areas (APEM, 2015) (WA Marine & Environment Ltd., 2010). The invasive leathery sea squirt, *Styela clava*, can displace native species and have adverse effects on the abundance of other shallow water suspension feeding sessile invertebrates. The species has been recorded within Morecambe Bay SAC, most recently at Fleetwood marina in 2016 (Hurst, 2016). The barnacle, *Austrominius modestus*, native to New Zealand and Australia, has been frequently recorded in the north-west of England and within the SAC in intertidal habitats (APEM, 2015) (Hurst, 2016). This species is unlikely to adversely impact designated features of the site.
Intertidal mud	Structure: non-native species and pathogens (habitat)	Restrict the introduction and spread of non-native species and pathogens, and their impacts.	Non-native species may become invasive and displace native organisms by preying on them or out-competing them for resources such as food, space or both. In some cases this has led to the loss of indigenous species from certain areas (Joint Nature Conservation Committee (JNCC), 2004). A pathogen causes disease or illness to its host. Pathogens include bacteria,	There have been very few records of non-native or invasive species in the SAC. Morecambe Bay supports a Pacific oyster, *Magallana gigas*, hatchery and trestle farm (Herbert et al., 2012). Mitigation measures and monitoring are part of an adaptive management strategy to prevent the accidental escape of non-native species which may cause ecological community changes (e.g. altering the population structure of *Mytilus edulis* by modifying specific predator-prey interactions (Waser et al., 2015). However, several large, wild specimens of M. gigas have been reported at Foulney Island in 2010 (WA Marine & Environment Ltd., 2010).

			viruses, protozoa and fungi (Biology-Online, 2008).	There have been individual records of Chinese mitten crab, *Eriocheir sinensis*, in the Duddon Estuary; the most recent of which was at Millom Pier in 2012 (North Western Inshore Fisheries and Conservation Authority, 2016). It is not clear if these are indications of persistent populations or sporadic occurrences. Japanese wireweed, *Sargassum muticum*, has been recorded within the SAC in the Walney Channel (Hawes et al., 2015), and in rockpools at North Walney and the Foulney Island areas (APEM, 2015) (WA Marine & Environment Ltd., 2010). The invasive leathery sea squirt, *Styela clava*, can displace native species and have adverse effects on the abundance of other shallow water suspension feeding sessile invertebrates. The species has been recorded within Morecambe Bay SAC, most recently at Fleetwood marina in 2016 (Hurst, 2016). The barnacle, *Austrominius modestus*, native to New Zealand and Australia, has been frequently recorded in the north-west of England and within the SAC in intertidal habitats (APEM, 2015) (Hurst, 2016). This species is unlikely to adversely impact designated features of the site.
Mudflats and sandflats not covered by seawater at low tide	Structure: non-native species and pathogens (habitat)	Restrict the introduction and spread of non-native species and pathogens, and their impacts.	Non-native species may become invasive and displace native organisms by preying on them or out-competing them for resources such as food, space or both. In some cases this has led to the loss of indigenous species from certain areas (Joint Nature Conservation Committee (JNCC), 2004). A pathogen causes disease or illness to its host. Pathogens include bacteria, viruses, protozoa and fungi (Biology-Online, 2008).	There have been very few records of non-native or invasive species in the SAC. Morecambe Bay supports a Pacific oyster *Magallana gigas* (formerly *Crassostrea gigas*), hatchery and trestle farm (Herbert et al., 2012). Mitigation measures and monitoring are part of an adaptive management strategy to prevent the accidental escape of non-native species which may cause ecological community changes (e.g. altering the population structure of *Mytilus edulis* by modifying specific predator-prey interactions (Waser et al., 2015). However, several large, wild specimens of M. gigas have been reported at Foulney Island in 2010 (WA Marine & Environment Ltd., 2010). There have been individual records of Chinese mitten crab, *Eriocheir sinensis*, in the Duddon Estuary; the most recent of which was at Millom Pier in 2012 (North Western Inshore Fisheries and Conservation Authority, 2016). It is not clear if these are indications of persistent populations or sporadic occurrences. Japanese wireweed, *Sargassum muticum*, has been recorded within the SAC in the Walney Channel (Hawes et al., 2015), and in rockpools at North Walney and the Foulney Island areas (APEM, 2015) (WA Marine & Environment Ltd., 2010). The invasive leathery sea squirt, *Styela clava*, can displace native species and have adverse effects on the abundance of other shallow water

				suspension feeding sessile invertebrates. The species has been recorded within Morecambe Bay SAC, most recently at Fleetwood marina in 2016 (Hurst, 2016). The barnacle, *Austrominius modestus*, native to New Zealand and Australia, has been frequently recorded in the north-west of England and within the SAC in intertidal habitats (APEM, 2015) (Hurst, 2016). This species is unlikely to adversely impact designated features of the site.
Intertidal sand and muddy sand	Structure: sediment composition and distribution	Maintain the total extent and spatial distribution of intertidal sand and muddy sand to ensure no loss of integrity, while allowing for natural change and succession	Sediment character is important in determining the biological communities present. Varied sediment type and grain size ensure structural complexity and connectivity. Intertidal sediments (ranging from highly stable mudflats and saltmarshes, to highly mobile shingle and sand beaches) are subject to a range of deposition and erosion processes, which human activity can influence. Most intertidal sediments stabilise over time so maintaining the sediment composition supports natural succession of the habitats and communities. Where they are subject to constant (net) erosion, the natural processes will be adversely affected (Gray and Elliott, 2009).	The distribution of intertidal sediments in the SAC conforms to the common pattern found in coastal inlets; the finer sediments occur in the sheltered innermost areas of the site and at the top of the shores. Deposits become increasingly coarse towards the open sea and lower down the shore (Anderson, 1972). The predominant sediment types are very fine and fine sand with considerable quantities of silt present at sites in the upper part of the SAC. The distribution of these sediments can vary on a local scale significantly with time, with tidal forces and related processes being the main agents affecting distribution (Anderson, 1972).
Intertidal mud	Structure: sediment composition and distribution	sediment composition types across the feature.	Sediment character is important in determining the biological communities present. Varied sediment type and grain size ensure structural complexity and connectivity. Intertidal sediments (ranging from highly stable mudflats and saltmarshes, to highly mobile shingle and sand beaches) are subject to a range of deposition and erosion processes, which human activity can influence. Most intertidal sediments stabilise over time so	The distribution of intertidal sediments in the SAC conforms to the common pattern found in coastal inlets; the finer sediments occur in the sheltered innermost areas of the site and at the top of the shores. Deposits become increasingly coarse towards the open sea and lower down the shore (Anderson, 1972). The predominant sediment types are very fine and fine sand with considerable quantities of silt present at sites in the upper part of the SAC. The distribution of these sediments can vary on a local scale significantly with time, with tidal forces and related processes being the main agents affecting distribution (Anderson, 1972).

			maintaining the sediment composition supports natural succession of the habitats and communities. Where they are subject to constant (net) erosion, the natural processes will be adversely affected (Gray and Elliott, 2009).	
Mudflats and sandflats not covered by seawater at low tide	Structure: sediment composition and distribution	[Maintain the distribution of sediment composition across the feature.	Sediment character is important in determining the biological communities present. Intertidal sediments (ranging from highly stable mudflats and saltmarshes, to highly mobile shingle and sand beaches) are subject to a range of deposition and erosion processes, which human activity can influence. Most intertidal sediments stabilise over time so maintaining the sediment composition supports natural succession of the habitats and communities. Where they are subject to constant (net) erosion, the natural processes will be adversely affected (Gray and Elliott, 2009).	The distribution of intertidal sediments in the SAC conforms to the common pattern found in coastal inlets; the finer sediments occur in the sheltered innermost areas of the bay and at the top of the shores. Deposits become increasingly coarse towards the open sea and lower down the shore (Anderson, 1972). The predominant sediment types are very fine and fine sand with considerable quantities of silt present at sites in the upper part of the bay. The distribution of these sediments can vary on a local scale significantly with time, with tidal forces and related processes being the main agents affecting distribution (Anderson, 1972).
Intertidal sand and muddy sand	Structure: sediment total organic carbon content	Maintain total organic carbon (TOC) content in the sediment at existing levels.	Total Organic Carbon (TOC) content can be used for measuring change in the organic input to the mudflat / sandflat. TOC content of the sediment can influence community structure and contaminant levels (Viaroli et al., 2004).	A condition assessment of north- west intertidal sand and mud features showed that organic content of sediment was low, ranging from 0.13% to 2.3% (Bhatia et al., 2013). Additionally, these values are within the range of those recorded in 1972 (Anderson, 1972), indicating that no major changes in organic input have occurred since that time. Higher values were associated with samples taken from estuarine areas (where the sediments are naturally fine with a high organic content) and upper shore muddy areas, often close to marsh boundaries.
Intertidal mud	Structure: sediment total organic carbon content	Maintain total organic carbon (TOC) content in the sediment	Total Organic Carbon (TOC) content can be used for measuring change in the organic input to the mudflat / sandflat. TOC content of the sediment can influence community structure and contaminant levels (Viaroli et al., 2004).	A condition assessment of north- west intertidal sand and mud features showed that organic content of sediment was low, ranging from 0.13% to 2.3% (Bhatia et al., 2013). Additionally, these values are within the range of those recorded in 1972 (Anderson, 1972), indicating that no major changes in organic input have occurred since that time. Higher values were associated with samples taken from estuarine areas (where the sediments

		at existing levels.		are naturally fine with a high organic content) and upper shore muddy areas, often close to marsh boundaries.
Mudflats and sandflats not covered by seawater at low tide	Structure: sediment total organic carbon content	Maintain total organic carbon (TOC) content in the sediment at existing levels.	Total Organic Carbon (TOC) content can be used for measuring change in the organic input to the mudflat / sandflat. TOC content of the sediment can influence community structure and contaminant levels (Viaroli et al., 2004).	organic content of sediment was low, ranging from 0.13% to 2.3% (Bhatia et al., 2013). Additionally, these values are within the range of those recorded in 1972 (Anderson, 1972), indicating that no major changes in organic input have occurred since that time. Higher values were associated with samples taken from estuarine areas (where the sediments are naturally fine with a high organic content) and upper shore muddy areas, often close to marsh boundaries.
Intertidal sand and muddy sand	Structure: species composition of component communities	Maintain the species composition of component communities.	Species composition of communities includes a consideration of both the overall range of species present within the community, as well as their relative abundance. Species considered need not be restricted to sessile benthic species but could include mobile species associated with the benthos. Species composition could be altered by human activities without changing the overall community type. Within each component community, species composition and population structure should be taken into consideration to avoid diminishing biodiversity and affecting ecosystem functioning within the habitat (Joint Nature Conservation Committee (JNCC), 2004). The sediment community composition will change when the habitat is subjected to pollutants and other forms of disturbance (Joint Nature Conservation Committee (JNCC), 2004), but will also be subject to significant natural variation annually. Benthic invertebrate communities are a good indicator of the health of the feature, if assessed over time.	Muddy sediments often support a high abundances of *Macoma balthica*, *Corophiumspecies* , *Peringia ulvae* and the ragworm, *Hediste diversicolor* (Bhatia et al., 2013). The peppery furrow shell, *Scrobicularia plana* has also been observed in muddy sediments (Royal Haskoning, 2006). As the salinity further decreases higher into the estuaries, ragworms and the burrowing amphipod, *Corophium volutator*, dominate the infaunal community (Rostron, 1992), (English Nature, 1997). The species composition of sediments in the site varies significantly with location and is subject to significant variations due to the dynamic nature of the sediment and physical process of the Morecambe bay SAC. However there should be no significant and sustained alteration in composition due to human influence for example through physical disturbance, water or sediment quality changes. The faunal quality of subfeature should be maintained at Good Status (a minimum mean IQI score of ≥ 0.64) with no sustained deterioration within the status (Environment Agency Marine Monitoring Service, 2014)

Intertidal mud	Structure: species composition of component communities	Maintain the species composition of component communities.	Species composition of communities includes a consideration of both the overall range of species present within the community, as well as their relative abundance. Species considered need not be restricted to sessile benthic species but could include mobile species associated with the benthos. Species composition could be altered by human activities without changing the overall community type. Within each component community, species composition and population structure should be taken into consideration to avoid diminishing biodiversity and affecting ecosystem functioning within the habitat (Joint Nature Conservation Committee (JNCC), 2004). The sediment community composition will change when the habitat is subjected to pollutants and other forms of disturbance (Joint Nature Conservation Committee (JNCC), 2004), but will also be subject to significant natural variation annually. Benthic invertebrate communities are a good indicator of the health of the feature, if assessed over time.	Muddy sediments often support a high abundance of *Macoma balthica*, *Corophium* species and *Peringia ulvae* and the ragworm, *Hediste diversicolor* (Bhatia et al., 2013). The peppery furrow shell, *Scrobicularia plana* has also been recorded in muddy sediments (Royal Haskoning, 2006). As the salinity further decreases higher into the estuaries, ragworms and the burrowing amphipod, *Corophium volutator*, dominate the infaunal community (Rostron, 1992) (English Nature, 1997). The species composition of sediments in the site varies significantly with location and is subject to significant variations due to the dynamic nature of the sediment and physical process of the SAC. However, there should be no significant and sustained alteration in composition due to human influence, for example, through physical disturbance, water or sediment quality changes. The faunal quality of the subfeature should be maintained at Good Status (a minimum mean IQI score of ≥ 0.64), the level of the highest previous Infaunal Quality Index (IQI) assessment, with no sustained deterioration within the status (Environment Agency Marine Monitoring Service, 2014).
Mudflats and sandflats not covered by seawater at low tide	Structure: species composition of component communities	Maintain the species composition of component communities.	Species composition of communities includes a consideration of both the overall range of species present within the community, as well as their relative abundance. Species considered need not be restricted to sessile benthic species but could include mobile species associated with the benthos. Species composition could be altered by	Upper shore areas generally have a higher species abundance and species richness in comparison to mid and lower shore sections, typically characterised by amphipods such as *Bathyporeia* and *Corophium* species, the lug worm *Arenicola marina*, the baltic tellin (*Macoma balthica*), and the spire shell (*Peringia ulvae*). Upper shore muddy sand sediments generally transition into medium to very fine sand at the mid and lower shore areas of the bay. Species richness and abundance are relatively low in comparison to upper shore areas and here species tend to include (*Arenicola marina*) and the thin tellin (*Angulus tenuis*).

			human activities without changing the overall community type. Within each component community, species composition and population structure should be taken into consideration to avoid diminishing biodiversity and affecting ecosystem functioning within the habitat (Joint Nature Conservation Committee (JNCC), 2004). The sediment community composition will change when the habitat is subjected to pollutants and other forms of disturbance (Joint Nature Conservation Committee (JNCC), 2004), but will also be subject to significant natural variation annually. Benthic invertebrate communities are a good indicator of the health of the feature, if assessed over time.	In past, surveys two species dominated the infauna throughout the intertidal mud and sandflats of the SAC: these being the Baltic tellin, (*Macoma balthica*) and the amphipod, *Corophium volutator*. This is consistent with historical data which cite these two species as dominating Morecambe Bay, with the spire shell, *Hydrobia ulvae* and the lug worm, Arenicola marina also being common throughout the Bay. The species composition of sediments in the site varies significantly with location as a consequence of the dynamic nature of the sediment and physical process of Morecambe bay. As a general guide the faunal quality of subfeature should be maintained at Good Status (a minimum mean IQI score of ≥ 0.64), with no sustained deterioration within the status (Environment Agency Marine Monitoring Service, 2014)
Intertidal sand and muddy sand	Supporting processes: sediment contaminants	Restrict surface sediment contaminants (<1cm from the surface) to below the OSPAR Environment Assessment Criteria (EAC) or Effects Range Low (ERL)	Various different contaminants are known to affect the species that live in or on the surface of sediments. These include heavy metals (Hg, As, Zn, Ni, Ch, Cd, etc), poly-aromatic hydrocarbons (PAHs), poly-chlorinated biphenyls (PCBs), organotins (TBT) and pesticides such as hexachlorobenzene. These can impact species sensitive to particular contaminants, degrading the community structure (eg heavy metals) and bioaccumulating within organisms, entering the marine food chain (eg PCBs) (OSPAR Commission, 2012).	The sediments of the eastern Irish Sea are known to have been historically contaminated with heavy metals such as cadmium, mercury, lead, zinc and arsenic (Department for Environment, 2000) (Camacho-Ibar et al., 1992). Sediment samples from within Morecambe Bay SAC have been shown to contain high concentrations of aluminium and iron, thought to be a result of the erosion of landmasses and subsequent riverine export. Sediments within the SAC did not contain sinks for metal contaminants exceeding Cefas Action Level (AL) 1 (DONG Energy, 2013). Radionuclide monitoring of sediment samples from Morecambe Central Pier contained americium-241, strontium-90 and caesium-137. Caesium-137 was present in the highest concentrations with 13 Bq kg-1, local enhancement occurring as a result of discharges from the Sellafield Works (Centre for Environment, 2014). In the Irish Sea, contaminant concentrations in sediments are generally higher than those found in seawater. Concentrations of polycyclic aromatic hydrocarbons (PAH) and polychlorinated biphenyls (PCB) were significantly higher in inshore areas where there was either riverine input and/or direct industry discharges (Centre for Environment, 2000).
Intertidal mud	Supporting processes:	Restrict surface	Various different contaminants are known to affect the species that live	The sediments of the eastern Irish Sea are known to have been historically contaminated with heavy metals such as cadmium, mercury, lead, zinc and

	sediment contaminants	sediment contaminants (<1cm from the surface) to below the OSPAR Environment Assessment Criteria (EAC) or Effects Range Low (ERL)	in or on the surface of sediments. These include heavy metals (Hg, As, Zn, Ni, Ch, Cd, etc), poly-aromatic hydrocarbons (PAHs), poly-chlorinated biphenyls (PCBs), organotins (TBT) and pesticides such as hexachlorobenzene. These can impact species sensitive to particular contaminants, degrading the community structure (eg heavy metals) and bioaccumulating within organisms, entering the marine food chain (eg PCBs) (OSPAR Commission, 2012).	arsenic (Department for Environment, 2000) (Camacho-Ibar et al., 1992). Sediment samples from within Morecambe Bay SAC have been shown to contain high concentrations of aluminium and iron, thought to be a result of the erosion of landmasses and subsequent riverine export. Sediments within the SAC did not contain sinks for metal contaminants exceeding Cefas Action Level (AL) 1 (DONG Energy, 2013). Radionuclide monitoring of sediment samples from Morecambe Central Pier contained americium-241, strontium-90 and caesium-137. Caesium-137 was present in the highest concentrations with 13 Bq kg-1, local enhancement occurring as a result of discharges from the Sellafield Works (Centre for Environment, 2014). In the Irish Sea, contaminant concentrations in sediments are generally higher than those found in seawater. Concentrations of polycyclic aromatic hydrocarbons (PAH) and polychlorinated biphenyls (PCB) were significantly higher in inshore areas where there was either riverine input and/or direct industry discharges (Centre for Environment, 2000).
Mudflats and sandflats not covered by seawater at low tide	Supporting processes: sediment contaminants	Restrict surface sediment contaminants (<1cm from the surface) to below the OSPAR Environment Assessment Criteria (EAC) or Effects Range Low (ERL)	Various different contaminants are known to affect the species that live in or on the surface of sediments. These include heavy metals (Hg, As, Zn, Ni, Ch, Cd, etc), poly-aromatic hydrocarbons (PAHs), poly-chlorinated biphenyls (PCBs), organotins (TBT) and pesticides such as hexachlorobenzene. These can impact species sensitive to particular contaminants, degrading the community structure (eg heavy metals) and bioaccumulating within organisms, entering the marine food chain (eg PCBs) (OSPAR Commission, 2012).	The sediments of the eastern Irish Sea are known to have been historically contaminated with heavy metals such as cadmium, mercury, lead, zinc and arsenic (Department for Environment, 2000) (Camacho-Ibar et al., 1992). Sediment samples from within Morecambe Bay SAC have been shown to contain high concentrations of aluminium and iron, thought to be a result of the erosion of landmasses and subsequent riverine export. Sediments within the SAC did not contain sinks for metal contaminants exceeding Cefas Action Level (AL) 1 (DONG Energy, 2013). Radionuclide monitoring of sediment samples from Morecambe Central Pier contained americium-241, strontium-90 and caesium-137. Caesium-137 was present in the highest concentrations with 13 Bq kg-1, local enhancement occurring as a result of discharges from the Sellafield Works (Centre for Environment, 2014). In the Irish Sea, contaminant concentrations in sediments are generally higher than those found in seawater. Concentrations of polycyclic aromatic hydrocarbons (PAH) and polychlorinated biphenyls (PCB) were significantly higher in inshore areas where there was either riverine input and/or direct industry discharges (Centre for Environment, 2000).

Annex 3: Pricing specification

Item of work/task	Grade of Staff	Day Rate	Number of days	Total Cost
Project management meetings				
Pre-survey reconnaissance				
Field survey				
Collation and analysis of results				
Reporting				
Other costs including materials / equipment				
T&S				
Total excl. VAT				

Annex 4: Scoring criteria

Scoring - Quality Criteria	
Rating of Response	**Score**
Very Good or Fully Compliant Submission: meeting all requirements and is fully explained in comprehensive detail.	9 - 10
Good or Fully Compliant Submission: meeting all the requirements and is explained in reasonable detail.	7 - 8
Satisfactory or Compliant Submission: meeting the essential requirements and is explained in adequate detail.	5 - 6
Weak or Partially Compliant (Minor issues) Submission: falls short of requirements in some areas and is poorly explained.	3 - 4
Unacceptable or Non-Compliant (Major issues) Submission: fails to meet requirements and is not explained.	1 - 2